Kansas Ducks Unlimited

Kansas Water Initiative

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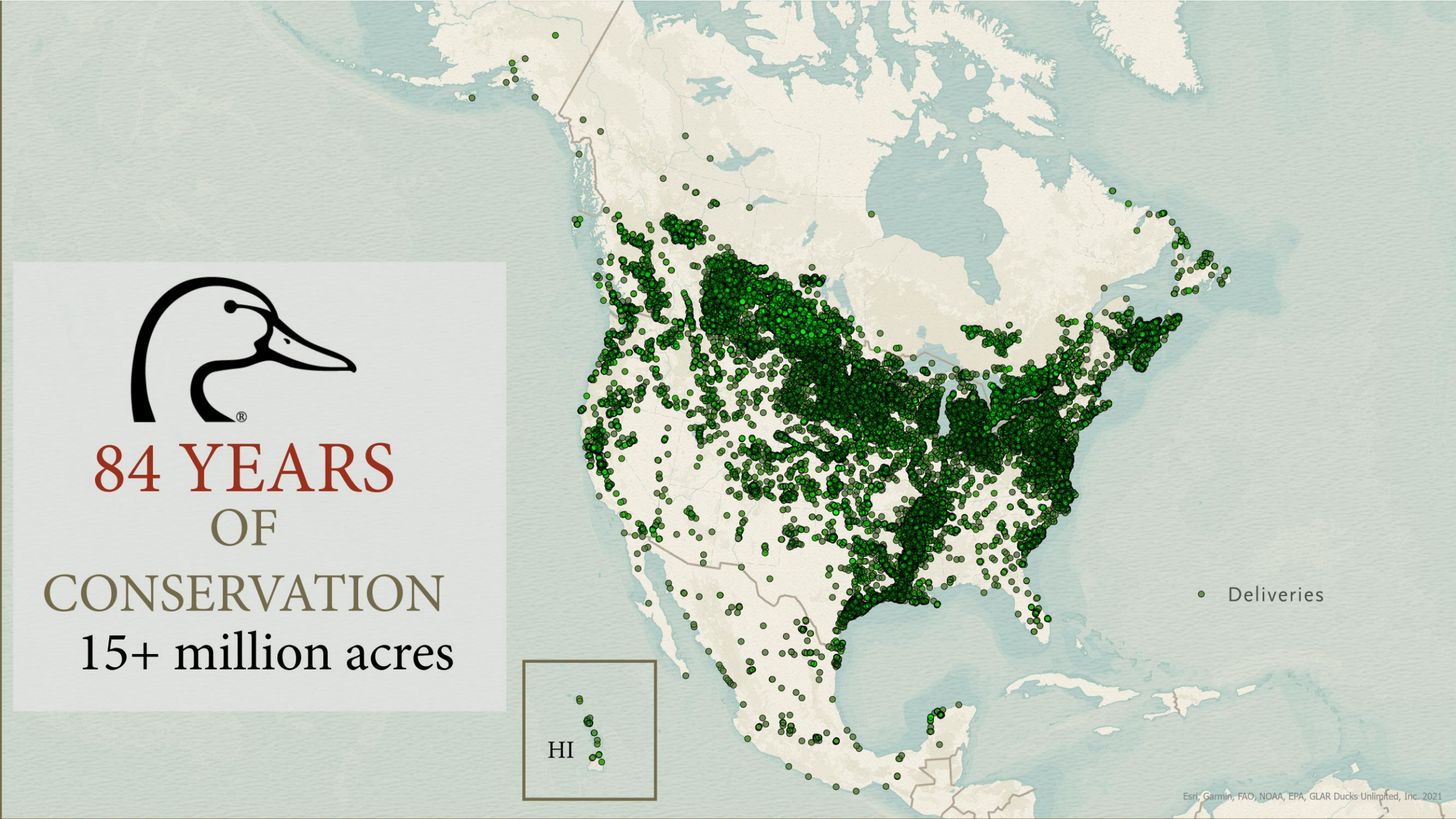
M.S. Wetland Soils and Hydrology - OSU

Our MISSION:

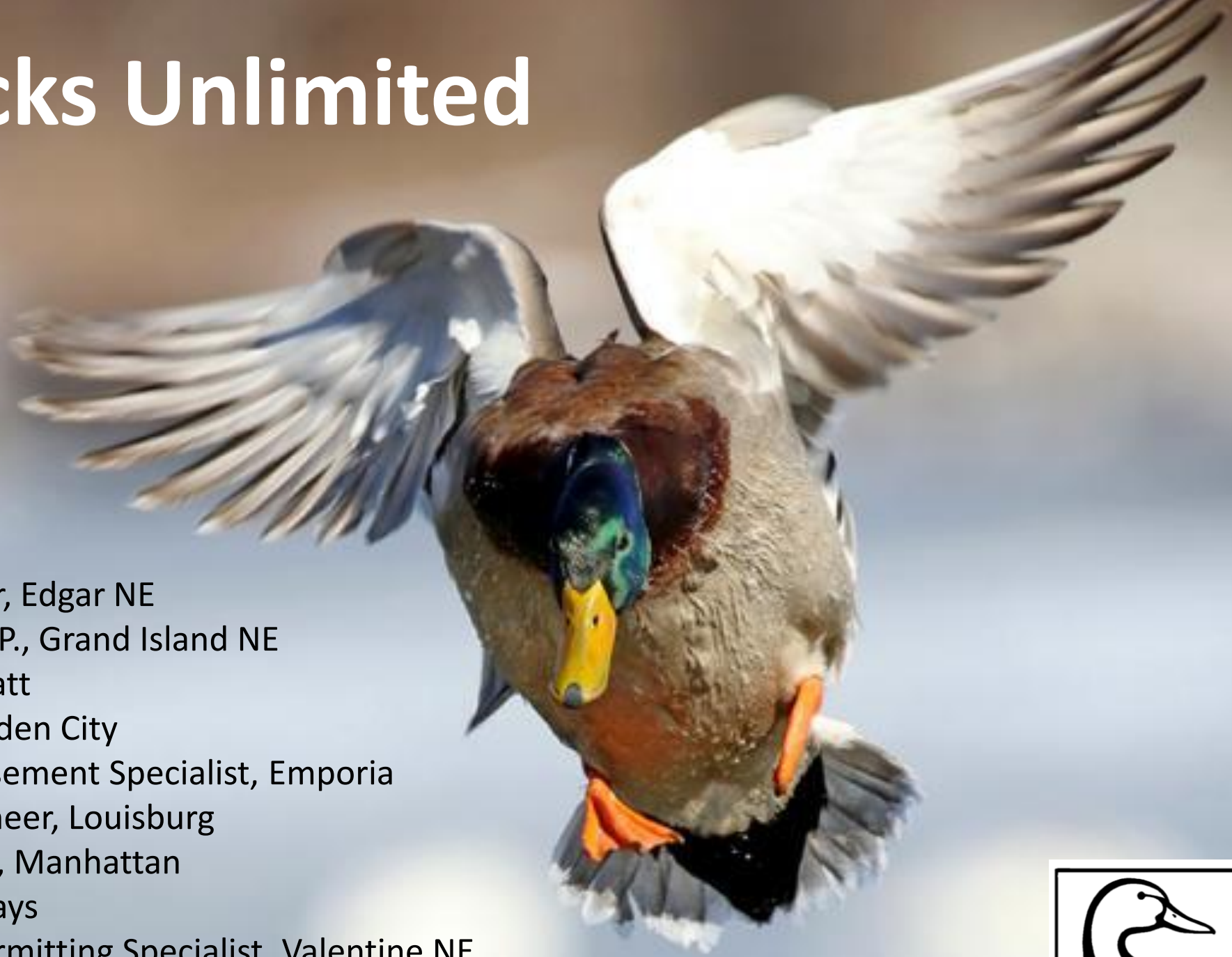
Ducks Unlimited conserves, restores, and manages wetlands and associated habitats for North America's waterfowl. These habitats also benefit other wildlife and people.


84 YEARS
OF
CONSERVATION
15+ million acres
HI
Deliveries
Esri, Garmin, FAO, NOAA, EPA, GLAR Ducks Unlimited, Inc. 2021

Sources of Support and Revenue

- 21% Events, Sponsorships and Memberships
- 10% Donated Conservation Easements and Public Service Announcements
- 48% Federal and State Habitat Support and Nongovernmental Partnerships
- 16% Major Gifts and Endowments
- 5% Royalties, Advertising and Other Revenues

Kansas Ducks Unlimited



Volunteers

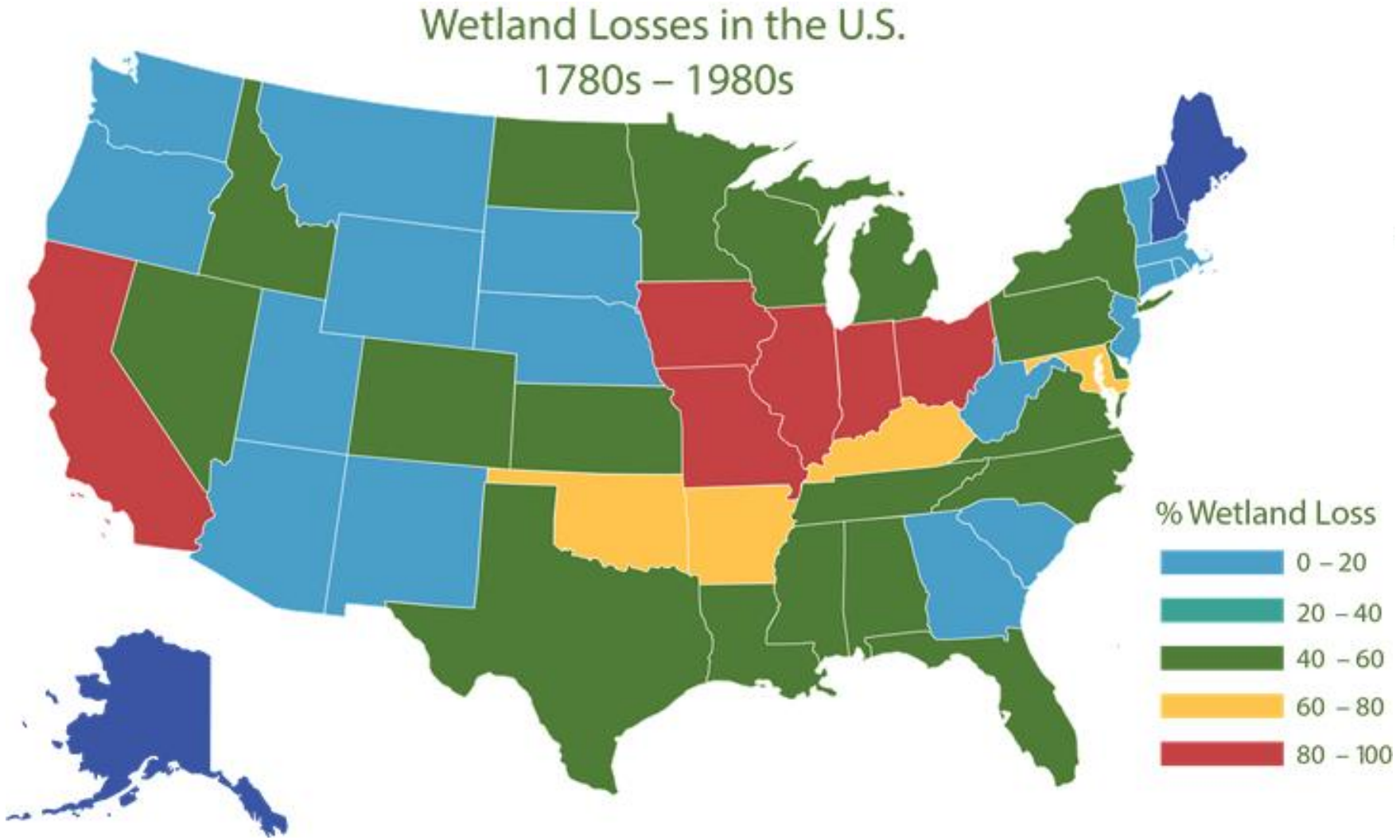
17,000 members
>125 annual events
>$1.4 million annually

Conservation Staff

- Tim Horst – Land Manager, Edgar NE
- Matt Hough – Manager C.P., Grand Island NE
- Joe Kramer – Biologist, Pratt
- Abe Lollar – Biologist, Garden City
- Jim Pitman – Biologist/Easement Specialist, Emporia
- Craig Roy – Regional Engineer, Louisburg
- Chris Thornton – Biologist, Manhattan
- Kade Urban – Engineer, Hays
- Ang Wright – Biologist/Permitting Specialist, Valentine NE

Why do we care about wetlands?

- Habitat
- Recreation
- Flood protection
- Water quality and quantity
- Erosion control
- Aesthetics



The US has lost 60 acres of wetland per hour over the last 200 years!

RESCUE OUR WETLANDS

Banding Together for Waterfowl

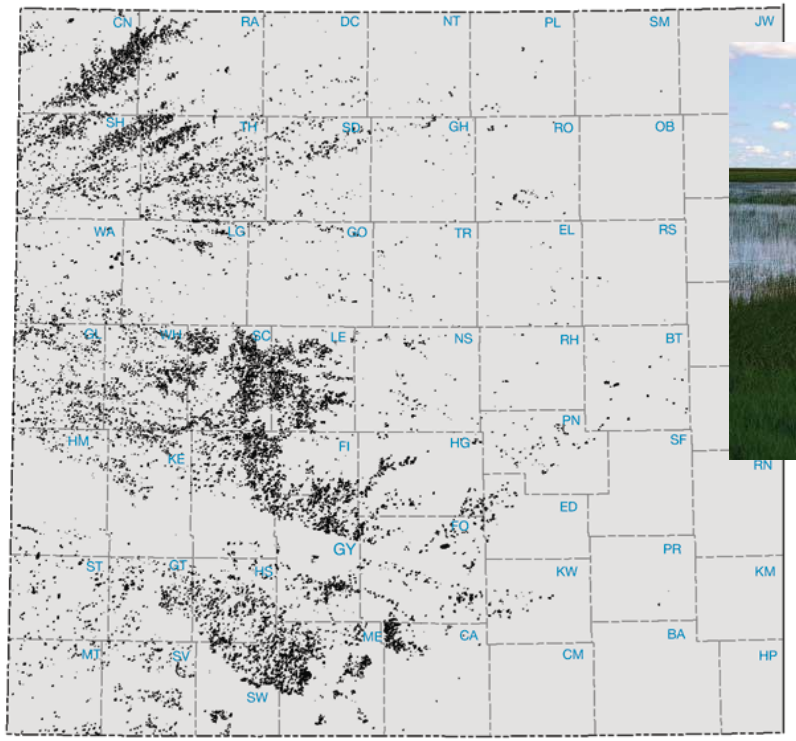
And the Kansas Water Initiative was born!

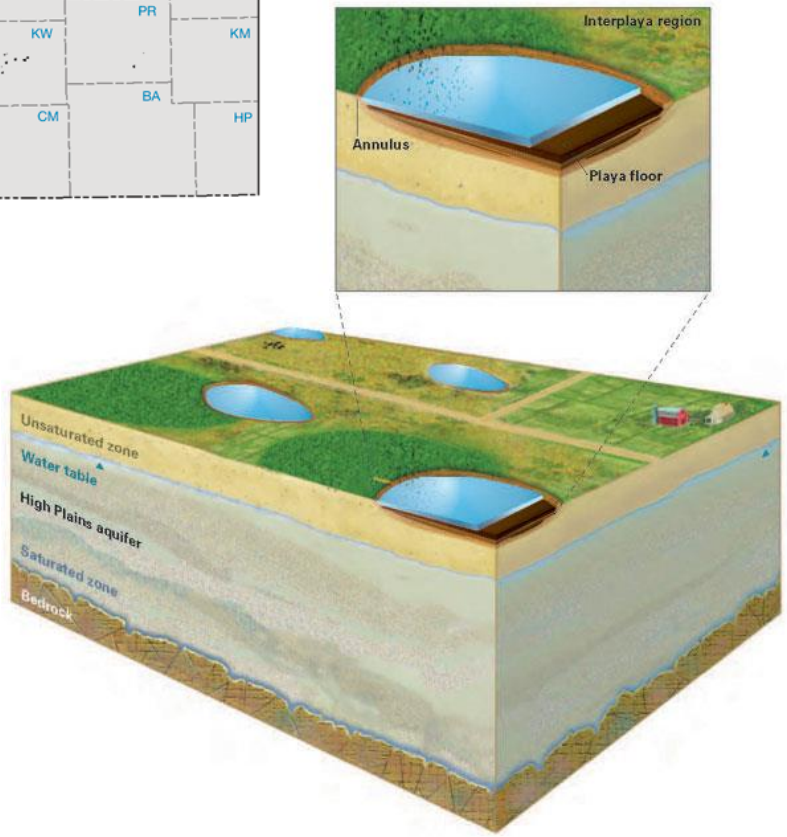
- Fundraising and conservation initiative to bolster awareness of the importance of wetlands to water issues in the state

Increasing Wetland Support Base

Promoting the benefits (Ecosystem Services) of wetlands conservation to more people, communities, corporations & foundations

Playas & Recharge





- Playas are depressional, ephemeral wetlands in the western third of Kansas
- They are the #1 source of recharge to the Ogallala Aquifer
- Restoration
  - Sediment removal
  - Upland buffers – shortgrass prairie
  - Hydrologic restoration (pits, ditches, roads, terraces, etc.)
- Focus on Kansas communities
  - Greely and Wichita Counties for recharge – PLJV RCPP
  - Possible projects around nitrate reduction - KDHE
- DU has cost-shared on over 4,000 playa wetland acres to date and counting
- FSA's CRP-38B has enrolled over 11k playa acres & buffers.
  - New signup has begun
- Workshop January 10-11, Liberal KS
  - We are looking for sponsors! $$$

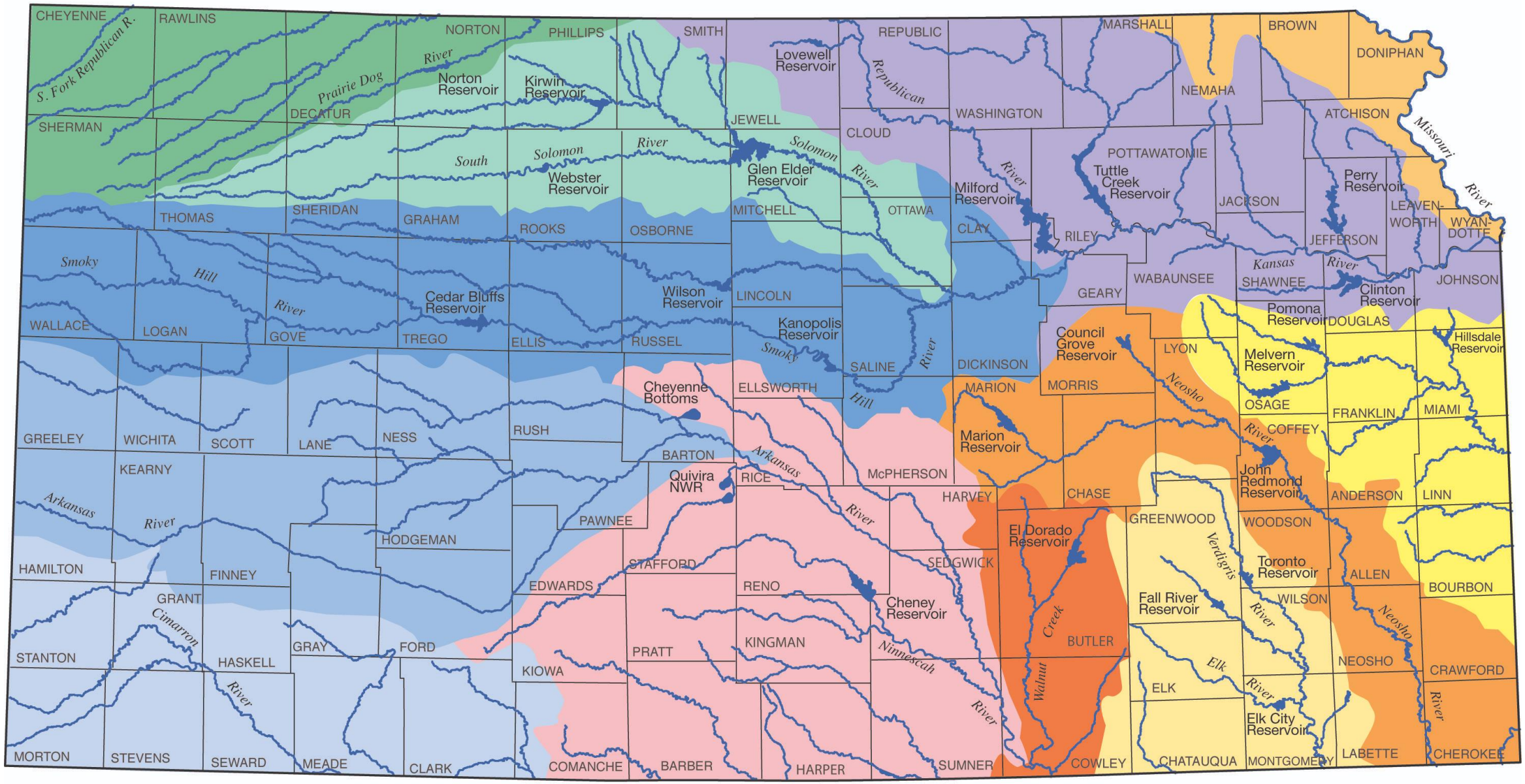
By The Numbers (best estimate)

Number of playas in KS	22,046
Total number of acres	81,495.74 acres
Average size of playa	3.70 acres
*Average recharge to aquifer (acre foot)	20,373 acre/ft
*Average recharge to aquifer (gallons)	6,621,225,000 gallons

- Average recharge: is base off average rainfall with a properly functioning playa. Over 90% of KS playas are not functioning properly due to sedimentation and other factors.


WIHA
WALK-IN
HUNTING AREA
FOOT TRAFFIC
ONLY
WIHA
WALK-IN HUNTING ACCESS
NOV. 1 - JAN. 31
FOOT
TRAFFIC
ONLY

MAJOR RIVER BASINS IN KANSAS



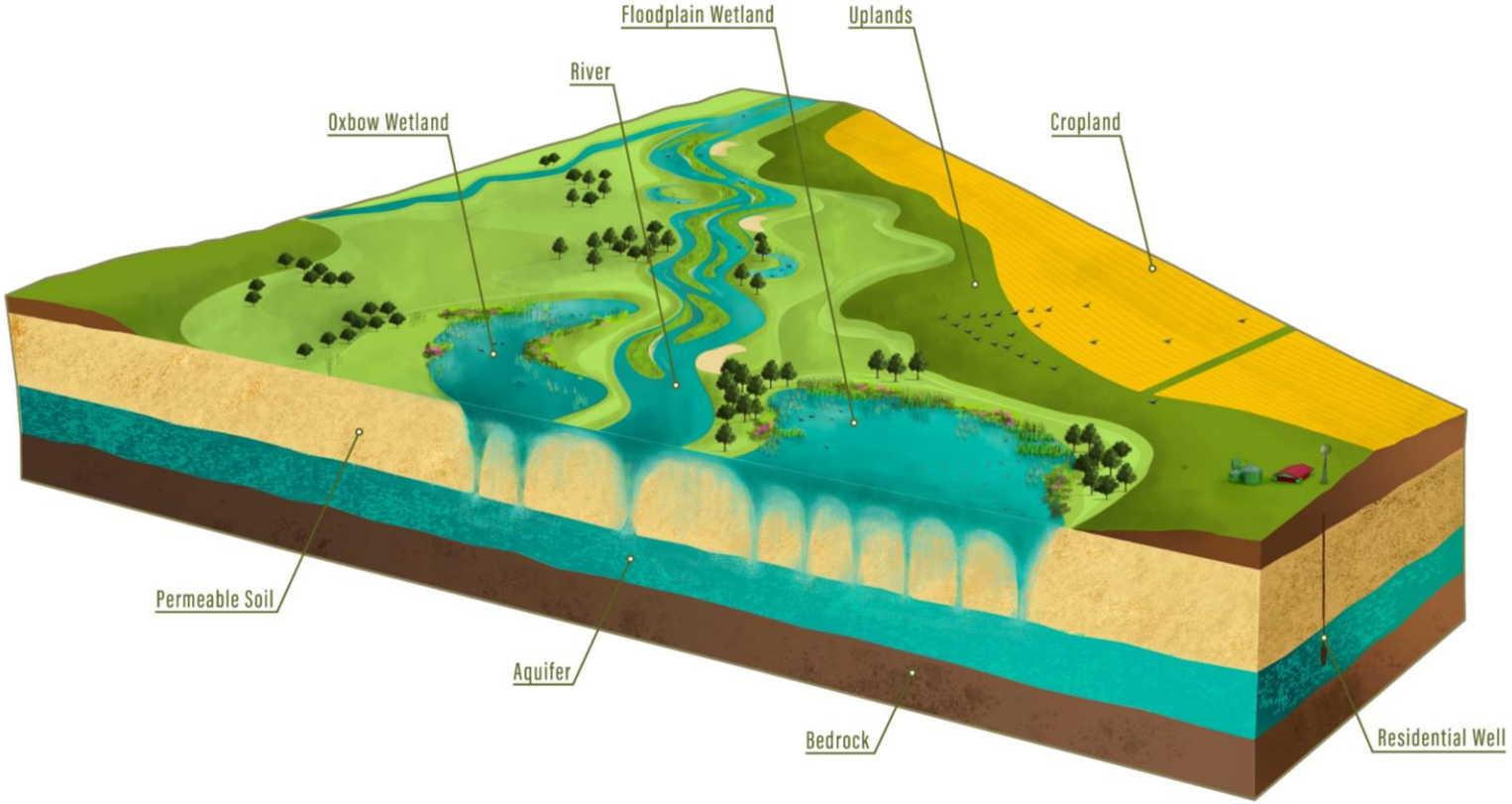
Phreatophyte Control

- Invasive woody species removal
- Focused on removal of species that use alluvial groundwater
  - Tamarisk, olive, ERC
- Estimated 1-acre foot of water can be returned for each 1.85 acres controlled or 0.54 acre-feet/ac
- Focal Areas
  - Rattlesnake Creek
  - Republican River (Cheyenne Co.)
  - Western Arkansas
  - Ninnescah River
- Chemical/mechanical
- Win-win scenario with cattle producers/conservation
- KAWS Workshop March 21-22, Dodge City, KS

Courtesy: Aron Flanders, PFW

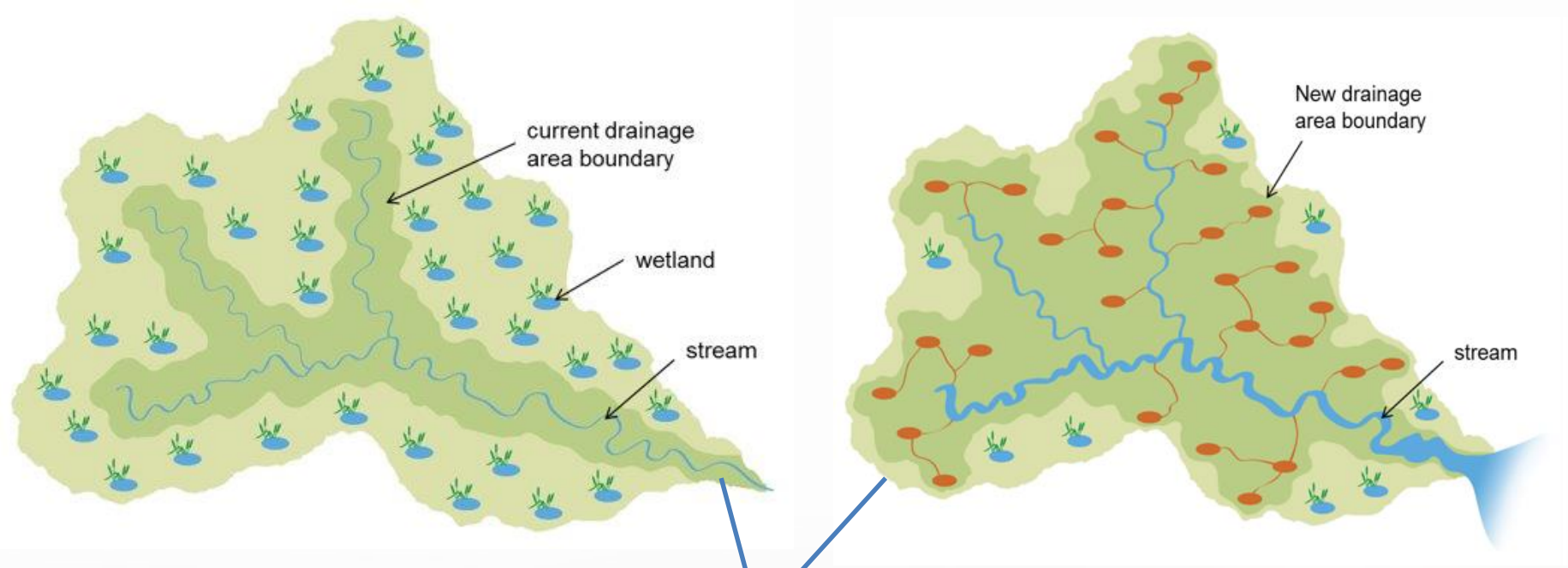
Flood Abatement

- Wetlands are Earth's sponges
- An acre of wetland, 1' deep, can hold **330,000 gallons** of water, reducing the magnitude of downstream flooding.
- Retimes flooding and slows it, reducing the energy & increasing recharge
- Restorations
  - Ditch Plugs
  - Sediment removal
  - Levees & WCS
  - Pumping infrastructure



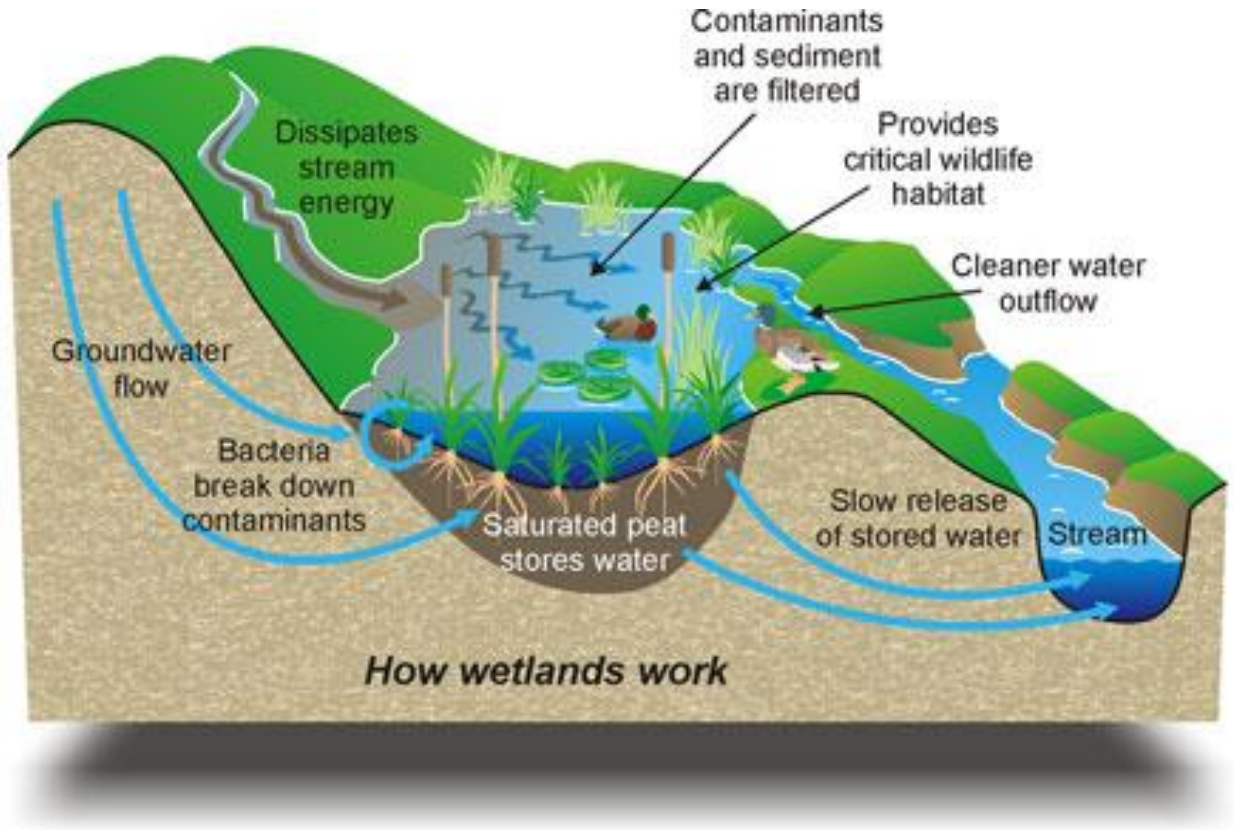
Wetland Values

Flood Water Storage



Wetlands & Water Quality

- Wetlands are Earth's kidneys
- On average, an acre of wetland can remove 40-70%* of excess nitrate loads from 100 acres of cropland runoff.
- It can also trap a dump truck load (13 tons)* of sediment annually before it enters rivers or reservoirs.
- Wetlands can remove up to 80%* of phosphorus & can also cycle out many pesticides.
- This is really gaining traction in IA, OH, MN, and more.
  - Less so in Kansas…YET!!!
- Case Study - Clinton WA
  - Study with City of Lawrence, KDHE, KDWP & KAWS
- Opportunities abound in KS
- Expensive? - Not really, and it's long-term!
  - Compared to other BMPs wetlands are 3-5x less expensive per lb N or P removed
  - Demand is only growing



Courtesy: Utah State University

*These ranges are from several international studies, and we are looking to assemble more local information for Kansas wetlands.

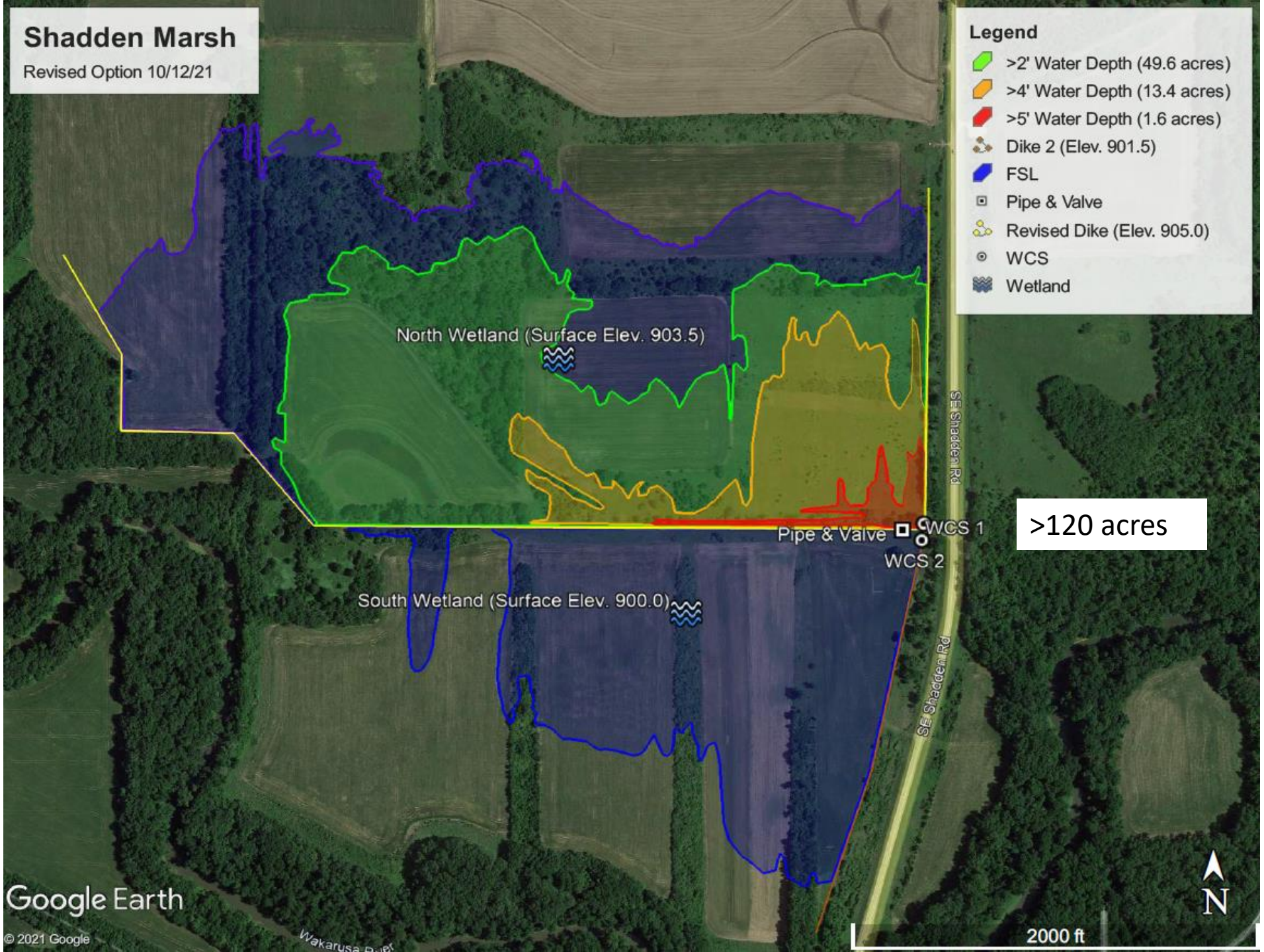
Integrated assessment modeling reveals near-channel management as cost-effective to improve water quality in agricultural watersheds

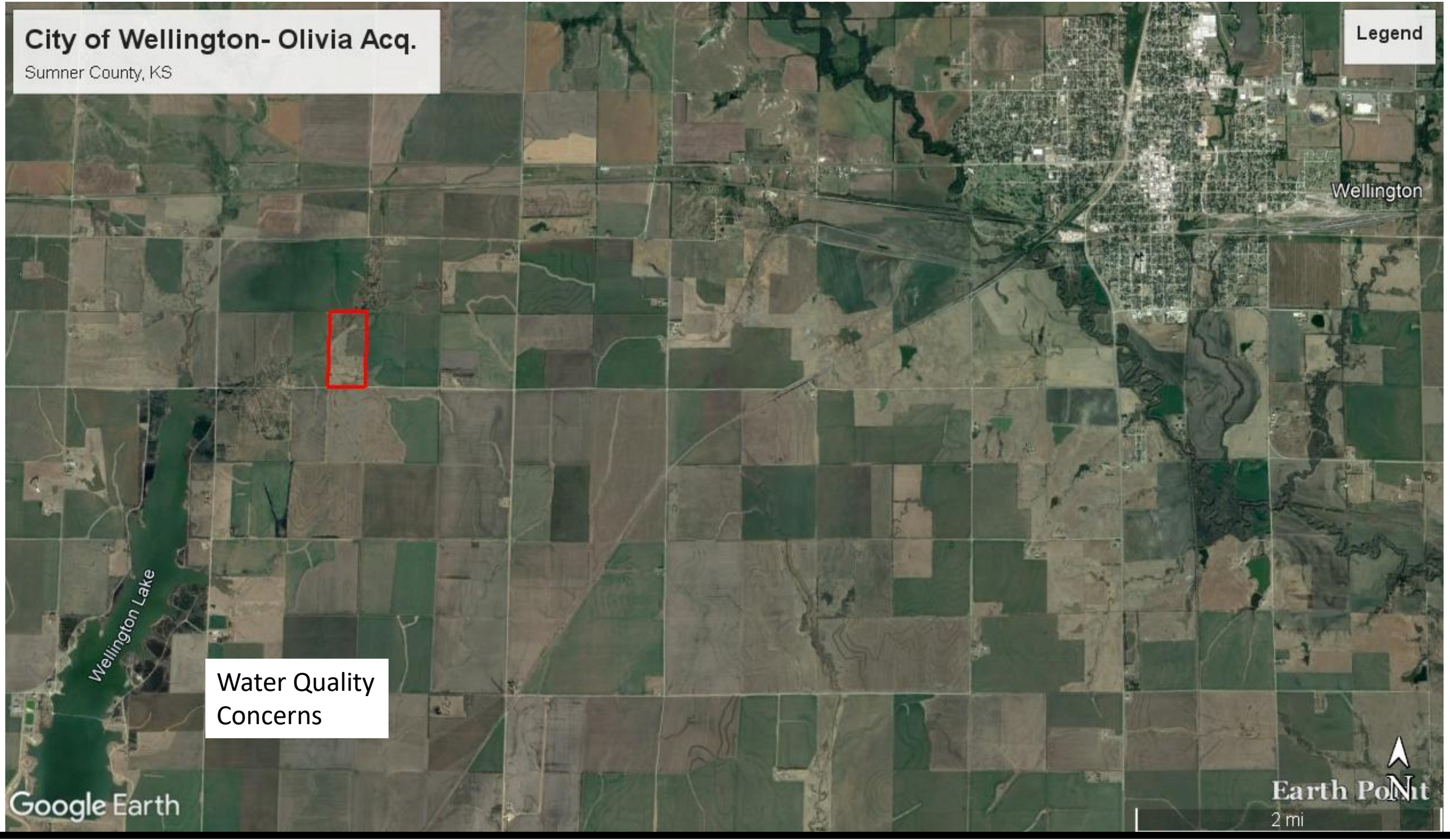
Amy T. Hansen[a,b,1], Todd Campbell[c], Se Jong Cho[a,d], Jonathon A. Czuba[a,e], Brent J. Dalzell[f,g], Christine L. Dolph[h,i], Peter L. Hawthorne[j], Sergey Rabotyagov[k], Zhengxin Lang[k], Karthik Kumarasamy[l], Patrick Belmont[l], Jacques C. Finlay[h], Efi Foufoula-Georgiou[a,m,n], Karen B. Gran[o], Catherine L. Kling[c,i], and Peter Wilcock[l]

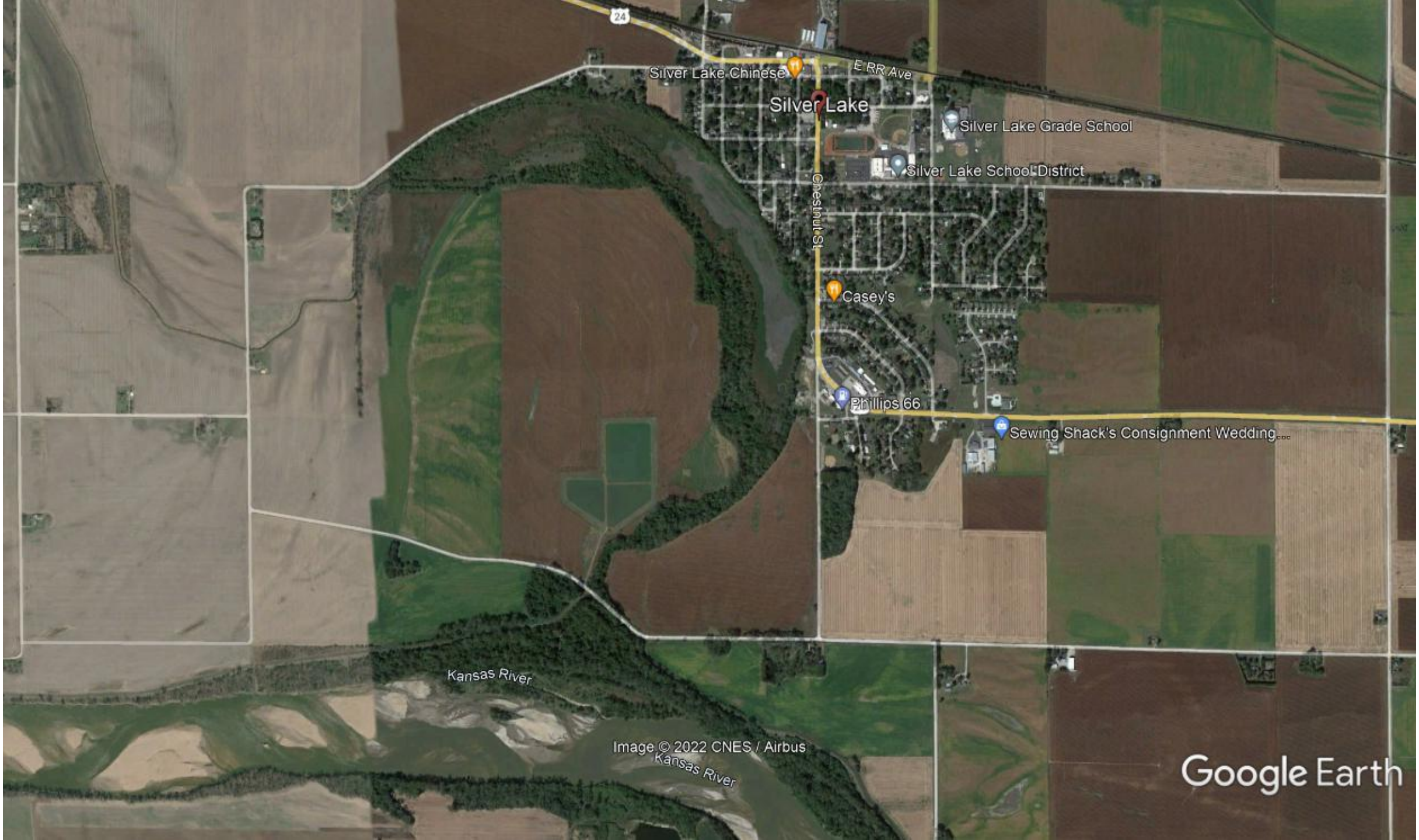
[a]St. Anthony Falls Laboratory, University of Minnesota, Minneapolis, MN 55455; [b]Civil, Environmental, and Architectural Engineering Department, University of Kansas, Lawrence, KS 66045; [c]Center for Agricultural and Rural Development, Iowa State University, Ames, IA 50011; [d]Hydrodynamic Branch, US Geological Survey, Reston, VA 20192; [e]Department of Biological Systems Engineering, Virginia Tech, Blacksburg, VA 24061; [f]Department of Soil, Water, and Climate, University of Minnesota, St. Paul, MN 55108; [g]Soil and Water Management Research Unit, US Department of Agriculture Agricultural Research Service, St. Paul, MN 55108; [h]Department of Ecology, Evolution, and Behavior, University of Minnesota, St. Paul, MN 55108; [i]Dyson School of Applied Economics and Management, Cornell University, Ithaca, NY 14853; [j]Institute on the Environment, University of Minnesota, St. Paul, MN 55108; [k]School of Environmental and Forest Sciences, University of Washington, Seattle, WA 98195; [l]Department of Watershed Sciences, Utah State University, Logan, UT 84322; [m]Department of Civil and Environmental Engineering, University of California, Irvine, CA 92697; [n]Department of Earth System Science, University of California, Irvine, CA 92697; and [o]Department of Earth and Environmental Sciences, University of Minnesota, Duluth, MN 55812

SUSTAINABILITY SCIENCE

- Riverine water quality study conducted in MN in an intense row-crop ag area with very poor water quality regarding cost-effectiveness of wetlands vs other BMPs
- Key Takeaways
  - Fluvial wetlands (wide, slow flowing and in the riverine corridor) are the **single-most cost-effective management action** to reduce nitrate and sediment loads.
  - Wetland restoration will be essential to meeting moderate to aggressive water quality targets.
  - Wetlands are costly up front but not when compared to long-term benefits
  - Placement and planning are critical
  - Watershed level planning and interagency cooperation will be required.

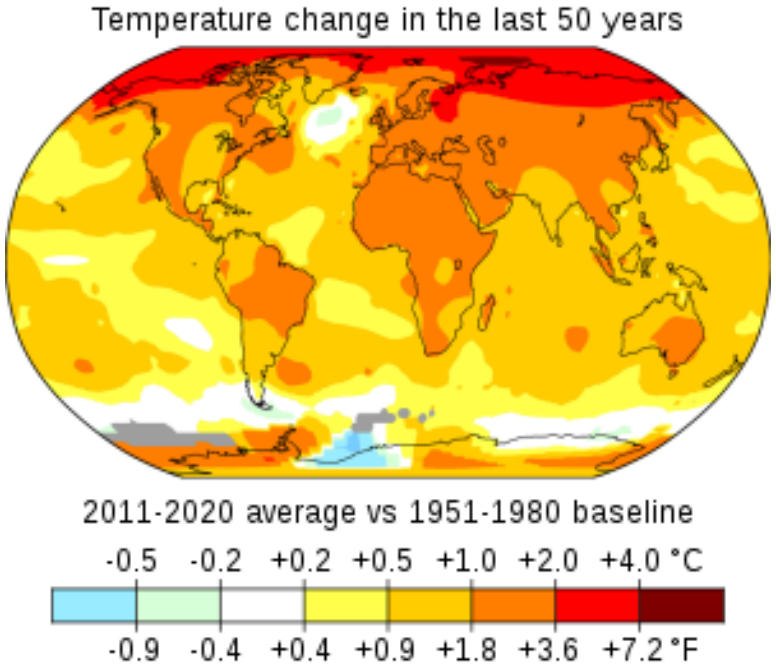

Shadden Marsh
Revised Option 10/12/21
Legend
>2' Water Depth (49.6 acres)
>4' Water Depth (13.4 acres)
>5' Water Depth (1.6 acres)
Dike 2 (Elev. 901.5)
FSL
Pipe & Valve
Revised Dike (Elev. 905.0)
WCS
Wetland
North Wetland (Surface Elev. 903.5)
South Wetland (Surface Elev. 900.0)
Pipe & Valve
WCS 1
WCS 2
SE Shadden Rd
SE Shadden Rd
>120 acres
Google Earth
© 2021 Google
N
2000 ft

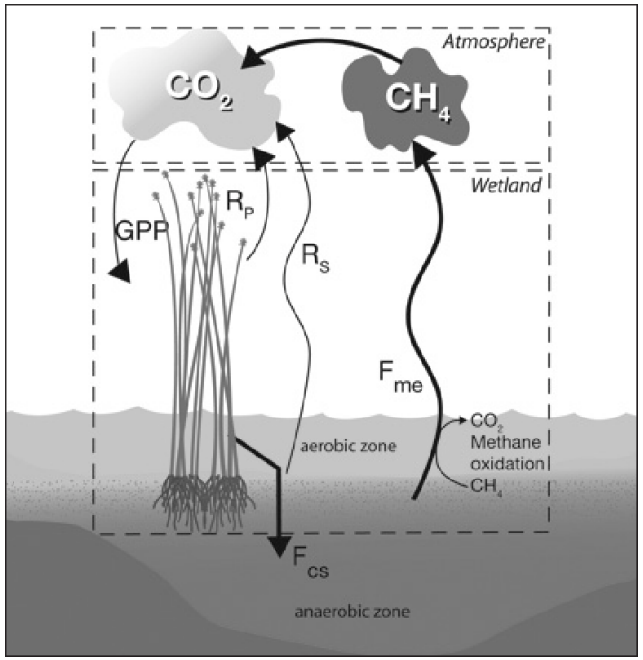

City of Wellington- Olivia Acq.
Sumner County, KS
Legend
Wellington
Wellington Lake
Water Quality Concerns
Google Earth
Earth Point
N
2 mi


24
Silver Lake Chinese
E RR Ave
Silver Lake
Silver Lake Grade School
Silver Lake School District
Chestnut St
Casey's
Phillips 66
Sewing Shack's Consignment Wedding...
Kansas River
Image © 2022 CNES / Airbus
Kansas River
Google Earth

Wetlands & Climate Change

- Wetlands help store and regulate carbon (think peat bogs or bottomland forest)
- Studies support wetlands like playas reduce greenhouse gas emissions.
  - Wetland protection and restoration ensures that wetland aren't converted to cropland which releases stored soil carbon as CO2 through oxidization.
- There has been some research on increased methane production by wetlands BUT this is a natural process.
  - DU was recently awarded a NRCS grant with USGS to study this aspect of wetlands in CRP across the country including KS.
- Other services of wetlands like recharge, flood abatement, and acting as natural firebreaks all help mitigate the other impacts of climate change.





Courtesy: Mitsch 2016

Beaver Dam Analogs

- BDAs and PALS (Post Assisted Log Structures)
  - Beaver dams without beavers?
  - New low-tech stream and wetland restoration technique
  - Popular in western US (UT, CO, OR, etc.).
  - Recently approved in KS as an EQIP practice.

- Conservation Innovation Grant
  - KS and NE Sites (Great Plains focus)
  - Focused on climate resiliency
  - Groundwater recharge
  - Water quality
  - Sediment storage
  - Stream morphology
  - Fish and invertebrates
  - Flooding impacts and floodplain reconnection
  - Workshops in 2023

Courtesy: Pollock; Bouwes, et al.

Courtesy: Utah USFWS PFW

Courtesy: Utah USFWS PFW

Courtesy: Utah State

Article | Open Access | Published: 08 November 2022

Beaver dams overshadow climate extremes in controlling riparian hydrology and water quality

Christian Dewey, Patricia M. Fox, Nicholas J. Bouskill, Dipankar Dwivedi, Peter Nico & Scott Fendorf

Nature Communications **13**, Article number: 6509 (2022) | Cite this article

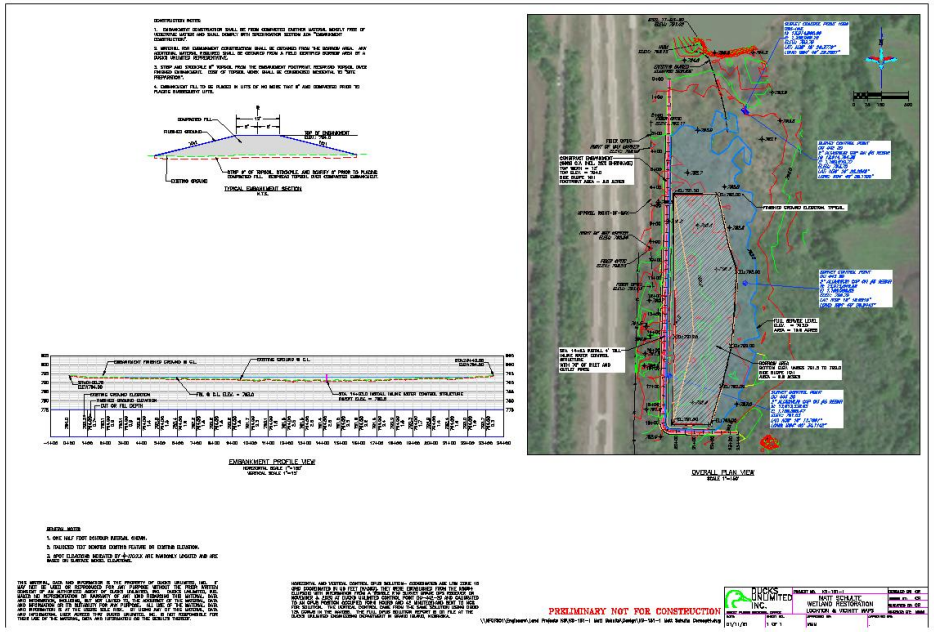
- Study in CO looking at beaver dams, hydrology, and water quality.
- Key Takeaways
  - Beaver dams could overshadow climatic hydrologic extremes in their effects on water residence time and oxygen and nitrogen fluxes in the riparian subsurface
  - Nitrate removal increased by 44.2%
  - Recharge of the alluvium was 10.7–13.3 times greater than seasonal hydrologic extremes

What services does Ducks Unlimited provide?

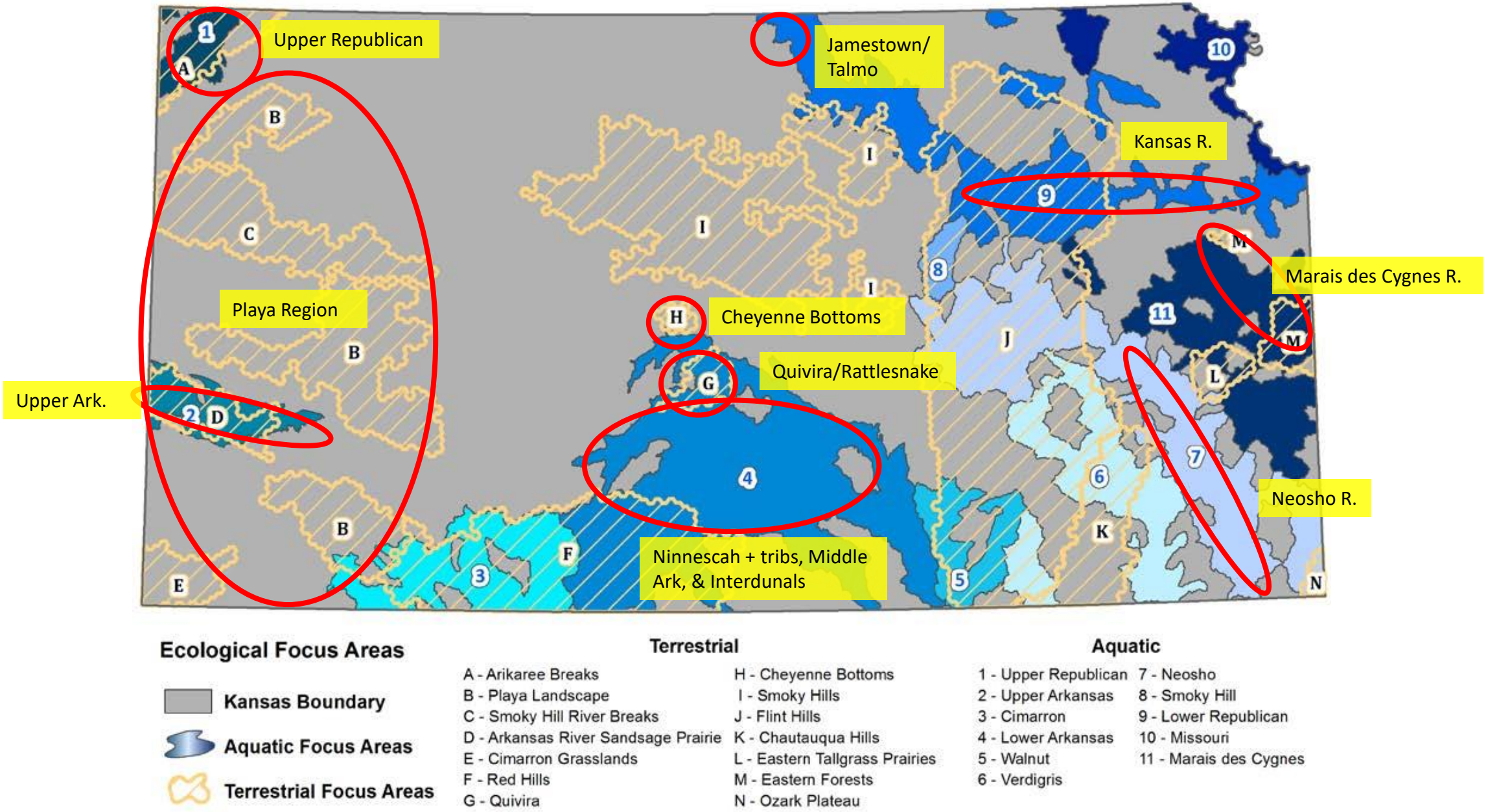
- Technical assistance
- Professional services
- Cost-share programs
- Land acquisitions
- Conservation easement delivery

Professional Services

- Surveying
- Engineering
- Wetland Permitting
- Construction Bidding
- Construction Management
- Wetland Mitigation



Conservation Hotspots



Research Priorities

- Water quality in Kansas riparian wetlands and playas
- Beaver and BDAs and wildfire mitigation
- Wetland hydrologic connections to river alluvium in floodplains
- Phreatophytes and recharge
- Interdunal geomorphology and importance to wildlife/migratory birds
- Carbon storage in Kansas wetlands/buffers
- Wetland vegetation benefits for pollinators (especially Monarchs)

Partners and Programs

- NRCS – EQIP; WRE; ALE; RCPP
- FSA
- KDWPT – Habitat First; Pittman Robertson; WIHA
- Kansas Forest Service
- USFWS PFW
- Department of Conservation
- Conservation Districts
- Other NGOs
- KDHE/KAWS/WRAPS – watershed programs

$$$ Funding Projects $$$

- Public
  - US Fish and Wildlife Service
    - North American Wetland Conservation Act (NAWCA) - $2-4M/Annually
    - KDWP/PR
    - Partners Program
    - Section 6
  - US Department of Agriculture
    - Wetland Reserve Easements (WRE); Agricultural Land Easements (ALE)
    - Environmental Quality Incentive Program (EQIP)
    - Regional Conservation Priority Partnership (RCPP)
    - Farm Service Agency (FSA) – Conservation Reserve Program (CRP)
  - National Fish and Wildlife Foundation (NFWF)
- Private
  - Landowners (in-kind; cash; donated easements)
  - Private Donors
  - Corporations
  - Foundations

Wetlands America Trust

DUCKS UNLIMITED

Future is Bright for Wetlands and Stream Conservation!

- ✓ Growing corporate sustainability movement
- ✓ Consumer pressure for sustainable sourcing and practices
- ✓ Growing public agency investments in ecosystem services
- ✓ Environmental conscience of the next generation


QUESTIONS?
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www.michaelfurtman.com