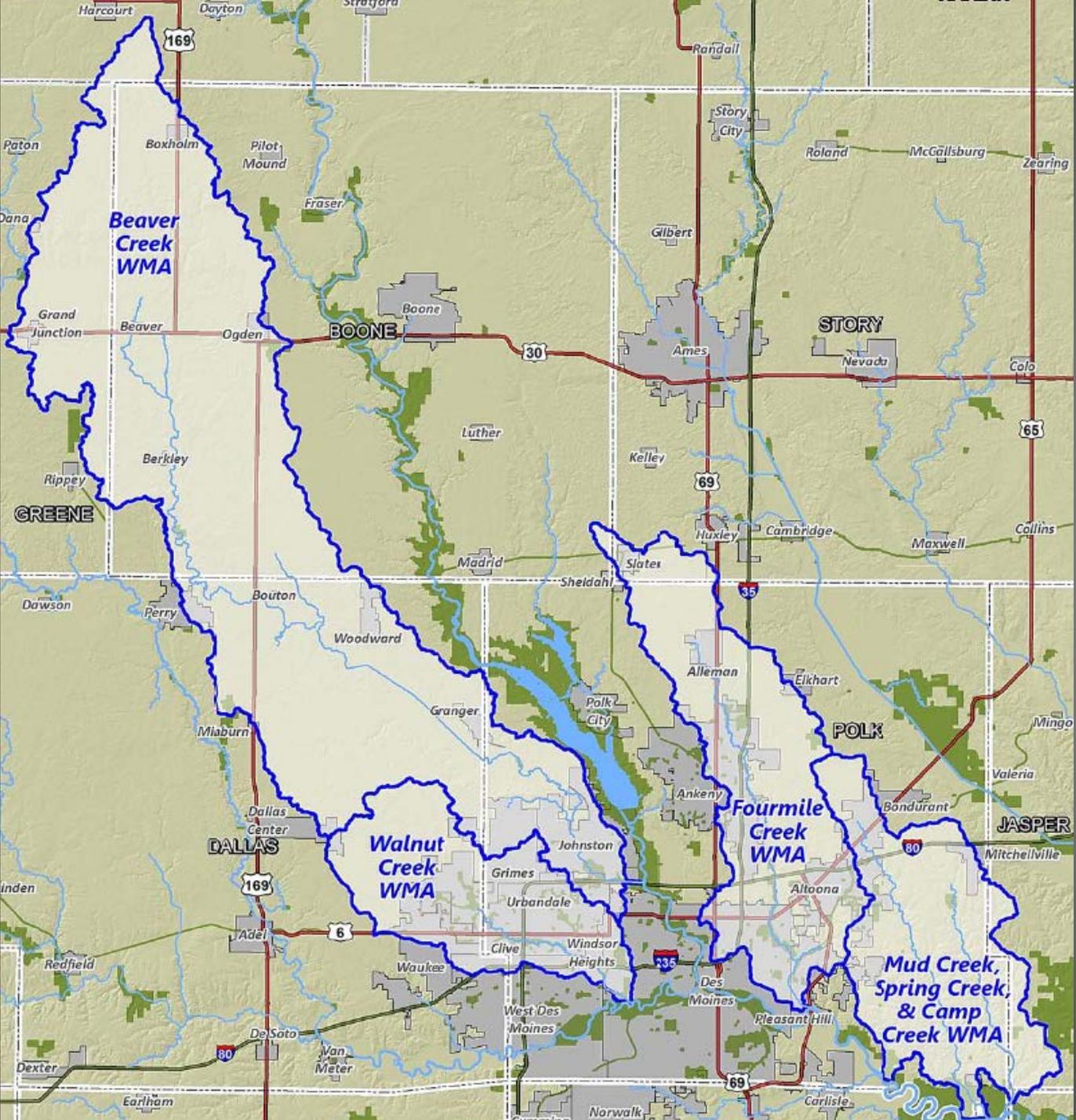


The Birth of the Batch and Build

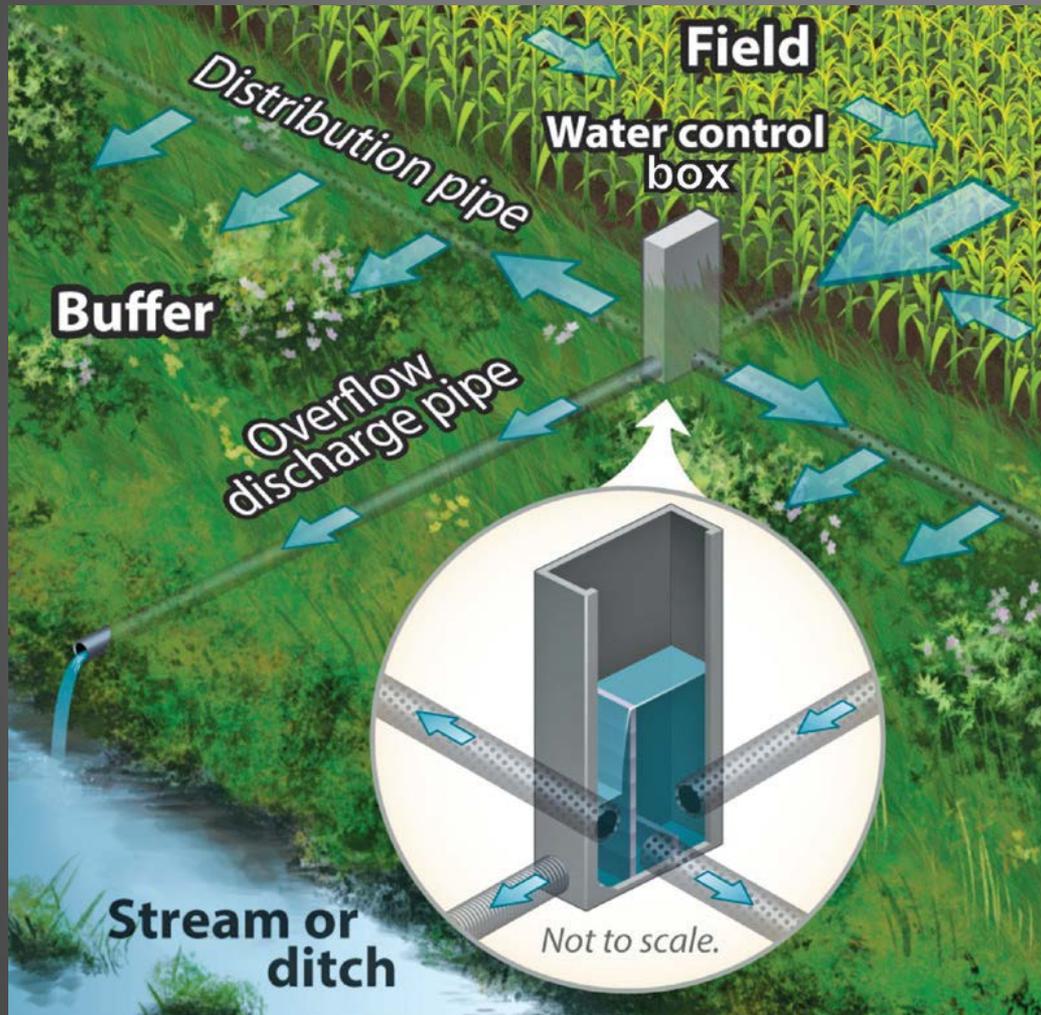
John Swanson
Polk County
Water Resources Supervisor



Treating Tile Drainage Systems



Saturated Buffers



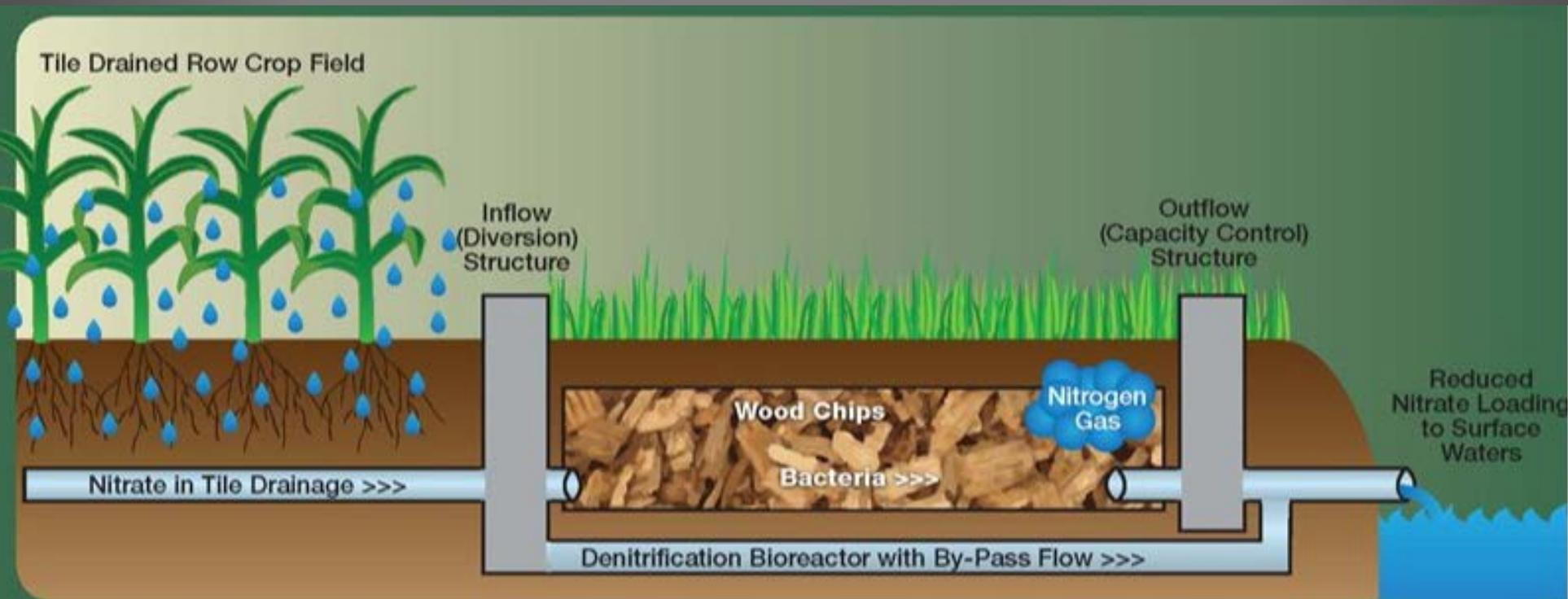
- Generally treat 4" -10" tile systems
- 15-60 acre drainage area
- Long life span
- Minimal maintenance
- Need 30' buffer along stream
- \$3,000-5,000 installation cost
- 50-60% N reduction



Not much to
look at

Bioreactor

- Can treat larger drainage areas (40-100+ acres)
- Minimal maintenance
- 15-20 year lifespan
- \$10,000-20,000 installation cost
- 50-60% N load reduction





The Problem

How do we get these installed?

The Problem

- Conservation planning mentality
- Lack of understanding around practices
- Lost in conversation round other practices
- Mixed program directions
- Tax considerations
- “The Hassle Factor”



A Chance Meeting

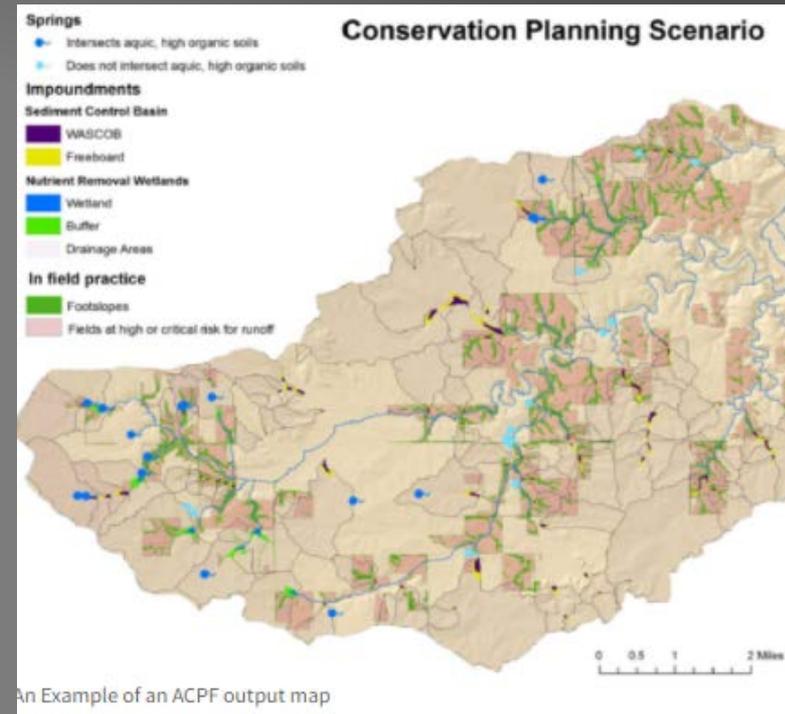
Idea came up with in a meeting between John Norwood (Commissioner), Charlie Schaefer (AgriDrain), and Amanda Brown (Watershed Coordinator)

1. Methodically targeting landowners, focused on tile outlets
2. Come up with a new funding model
3. Group sites together for more efficient survey/design/construction
4. Bid out projects in different grouping sizes, find out what is most efficient
5. Provide landowner incentive

The "Carpet Bomb Approach"

Mapping- Priority Fields

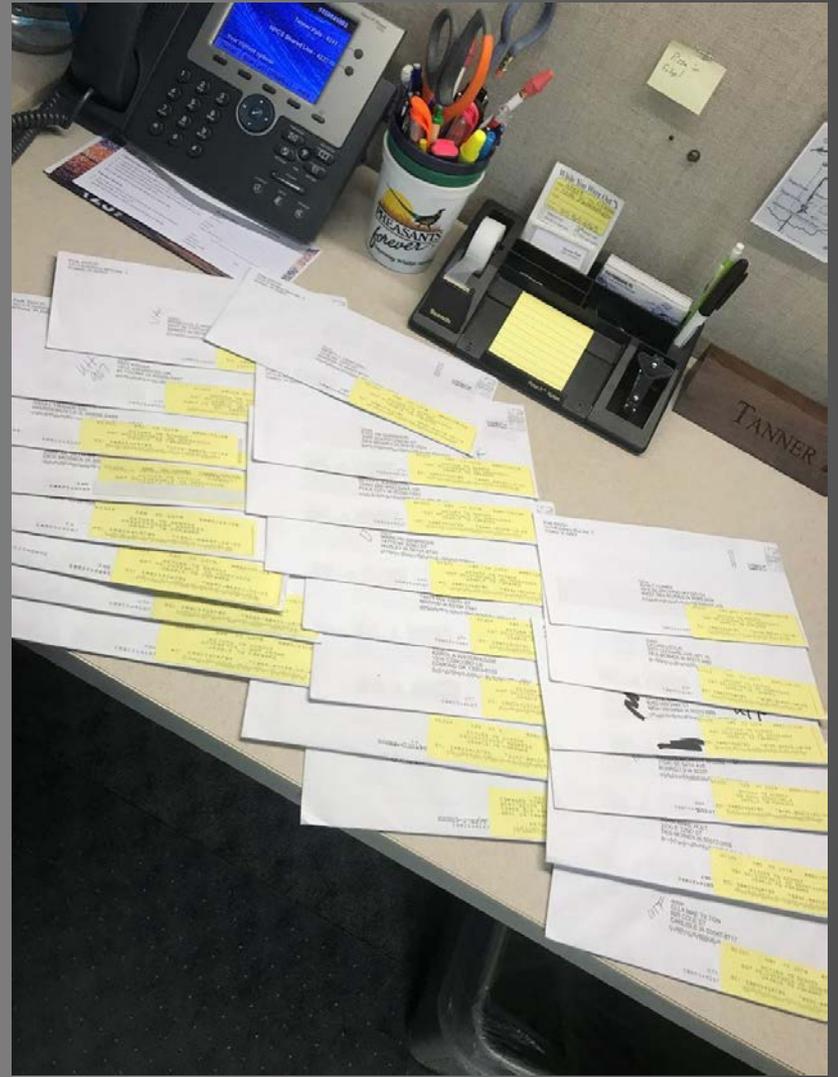
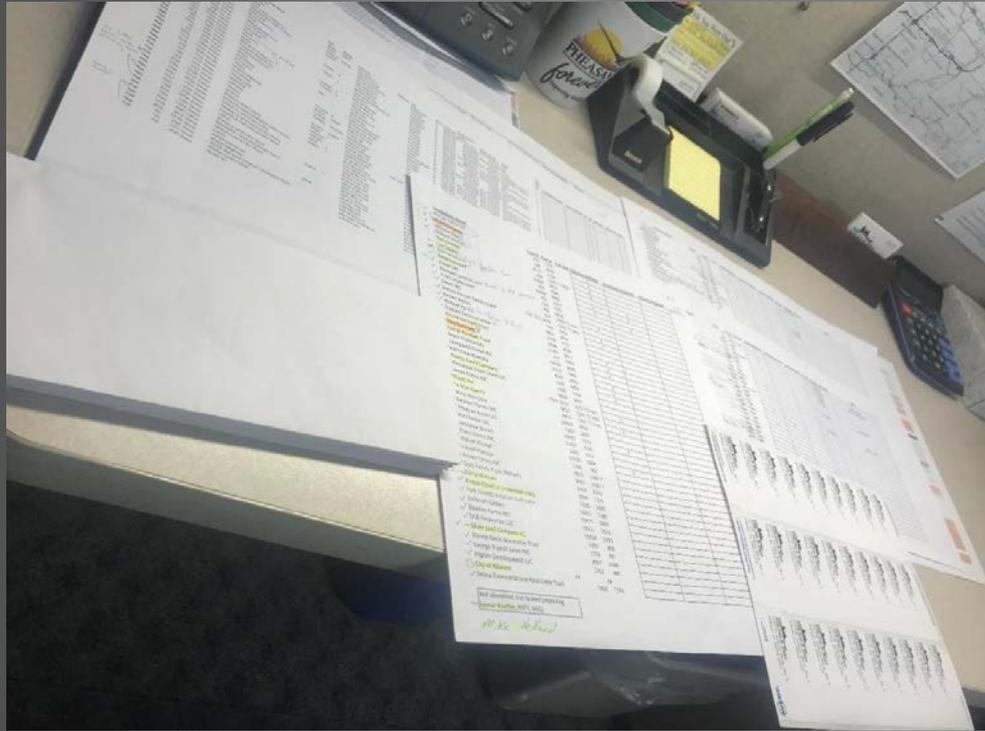
- Identify fields with high chance of success
- Actually using ACPF for the first time
- Existing Buffers
- Create a priority list of fields
- Year 1- 75 prioritized fields



Project Managers

- Project Coordinator paired with every landowner
- Point of contact for entire project timeline
- Simple targeted phone calls and meetings





Survey

- Surveyed 130 outlets in 2020
 - 200 in 2021
- Standardizing survey process + code system
 - topo survey
 - soil test
 - tile survey
 - nitrate sample
- Saturated buffer primary + bioreactor secondary



Getting Organized

LO/TRACT	MAV*	B/S	Soils/streams/topo	Wet/cul/T&E	LO fo
K. Lehman					
- T. 10459	→ 6 4 8 20 6 6 8 6	⑧			
- T. 1058 Not WS					
- T. 701	→ 8 15	②			
- T. 699	→ 8 6 8 10 8 8 15 ?	④			
- T. 691	→ Fix 8 8	①			
- T. 10458	→ 12	①			
- T. 2556	→ 12 12	②			
Elwell FAMILY					
T. 720	→ 10 4 8 8	④			
T. 721	→ 8 12 6	②			
T. 2678	→ 6 8 8	③			
Lee Tesdell T. 697	→ 8 8 8 6 10 6 6	③			
Wellendorf T. 707	→ 6 10	②			
H. Silver					
T. 1141	→ 8	①			
T. 1157	→ 5 8 12	③			
K. Wendt					
T. 8744	→ 6 6	②			
T. 2537	→ 4 6 ?	②			
MWA T. 10457 ✓	1				
J. Bros T. 705	12 8 10	⑤			
Hutz 1 *	10 4 ? 5 6	④			
Elwell - F. 4490					
FAM - T. 8770					
FAM - T. 8771					
Koethe T. 8473					
RMJ Farms T. 11007	6 10 ? 2 8 6 5 6 6 6 10 3	③			
Tim Minton T. 24324	8 12 6 6 10 8	⑥			

Getting Actually Organized



Improved Survey Techniques

- Focus on efficiency
 - 1 hour per outlet
- Minimize trips
- Gather all information from initial survey
- Fix landowner issues
 - New outlets
 - Head cuts
- Create a survey anyone can design from



Design

- Can be complicated....
 - Tie multiple outlets together
 - Automated saturated buffers
 - Reverse Grade Bioreactors
- Lessons Learned
 - Be selective with survey sites
 - Understand your designers needs and time
- Jason Foss (NRCS)
 - 90 feasibilities in 6 weeks
 - 60 full designs in 6 months
- Sarah Anderson (NRCS)
 - Oversight, input, and approval



A New Funding Model

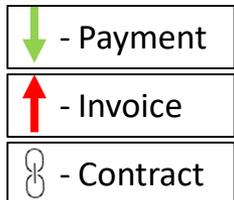
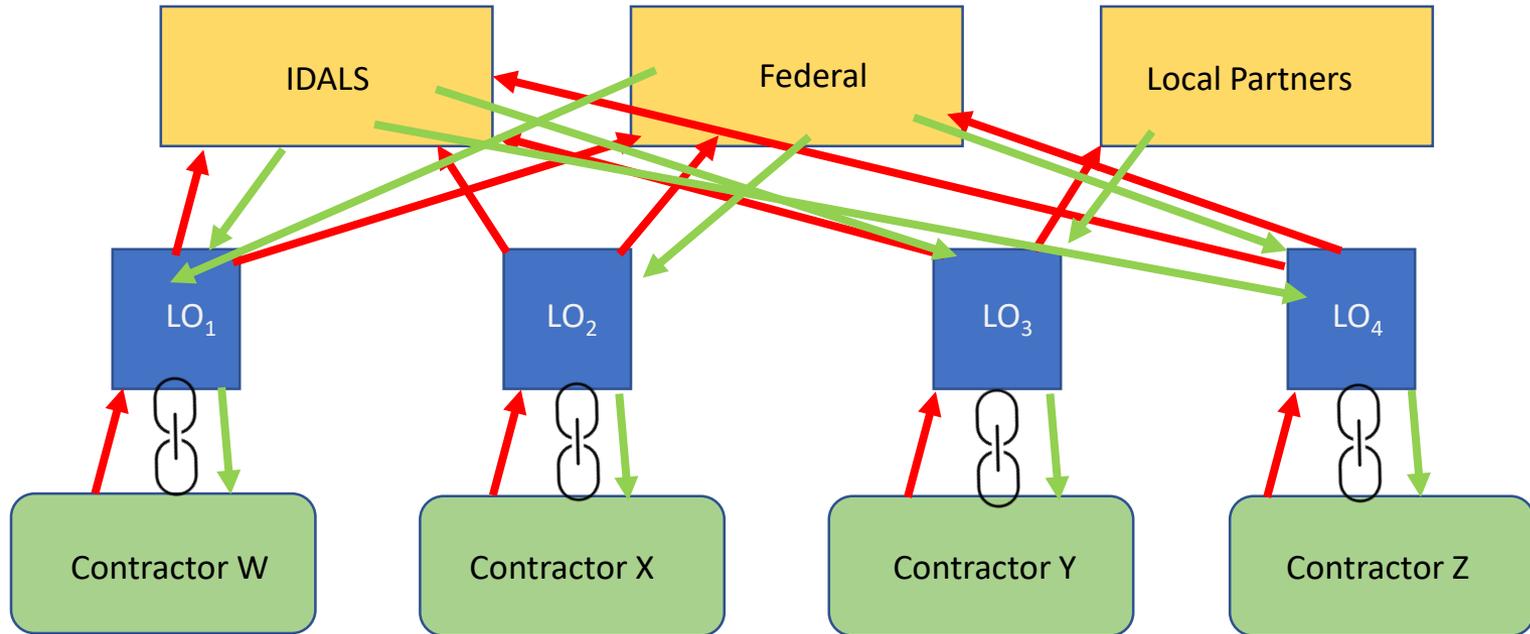
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Conventional Funding Programs

- Landowner gets funding approved by PSWCD
 - Hires contractor
 - Gets reimbursed for project cost
 - All "cost share" considered taxable income
- IDALS- WQI up to 75%
 - Easiest, well defined
- FSA- CRP up to 100%
 - Under utilized and confusing
- NRCS- EQIP
 - Long ranking and funding process
- Stacking options
- Polk County provides 25% to match IDALS



Conventional Funding Model



Problems

- A lot to go through for minimal on farm benefits
- Tax considerations
- Complicated for landowner



IOWA WATERSHED APPROACH

A Vision for Iowa's Future

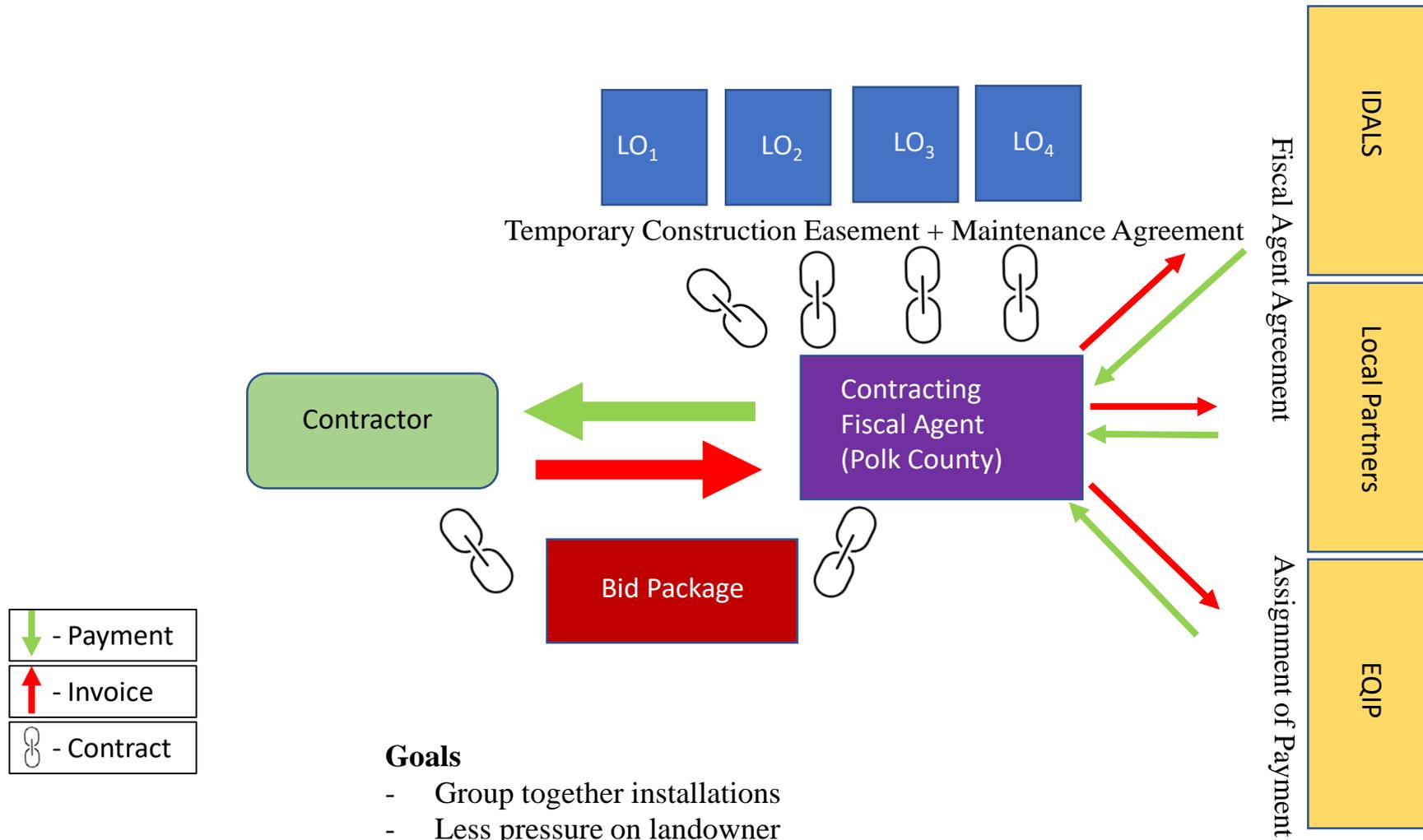
[IWA INFORMATION SYSTEM](#)

[OVERALL IWA PROGRAM](#)

Fiscal Agent Funding Model

- Treat installations like a public improvement project
- Central Fiscal Agent (Polk County) takes in all partner funding
- Utilizes funding to bid out projects in groups
- County contractor enters private property via temporary construction and access easement
 - LO paid \$1,000 easement payment for each outlet they treat
- Landowner signs standard 10-year maintenance agreement
 - Fiscal agent has not long term responsibility
- Funding never goes to landowner, not tax issues

Fiscal Agent Funding Model



Goals

- Group together installations
- Less pressure on landowner
- Simplify funding for numerous small projects
- Incentivize participation

Results

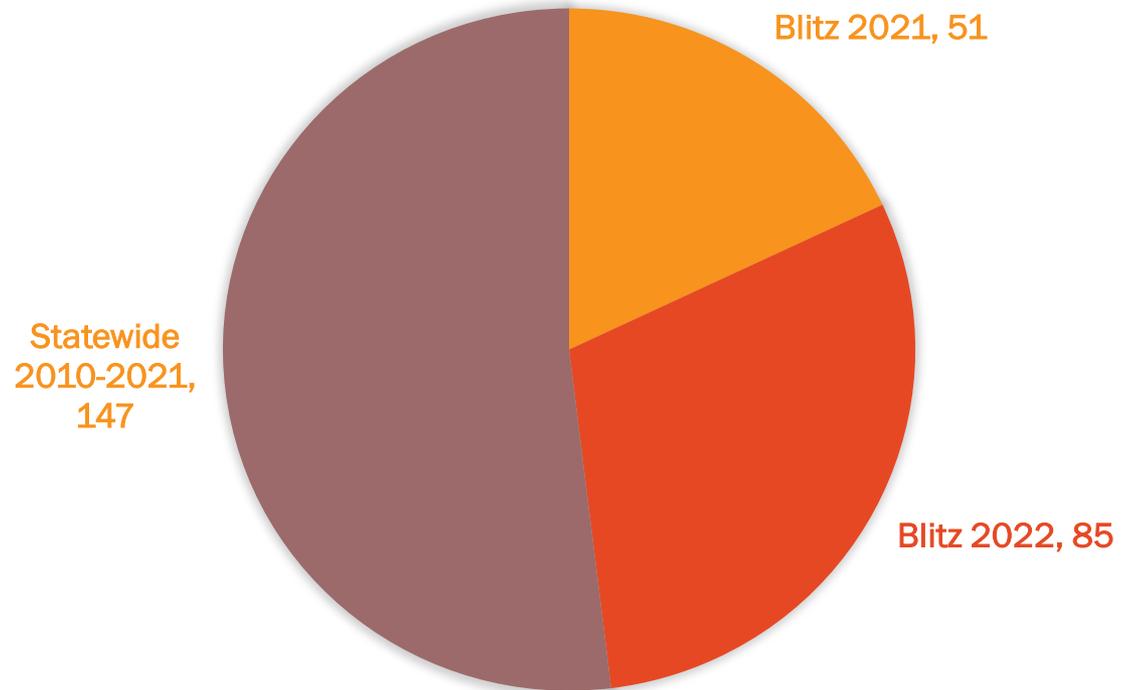
Round 1- 51 installations in Polk County (2021)

Round 2- 85 installations in Polk and Story County (2022)

Round 3- Expansion into Dallas, Boone, and NE Iowa (2023)



The Numbers



Timeline- 2 year process

- Year 1
 - February-March- Outreach
 - March-June- Survey
 - June-July- Design Feasibility and Follow up Landowner Meeting
 - August-January- Full Design and Conservation Planning
- Year 2
 - February- Final Sign Up Meetings
 - March- April- Project Bidding
 - May-December- Project Construction



Major Takeaways

- New Mindset “We would like to treat every tile outlet in each field”
- Outreach, survey, design, and construction all benefit from bundling approach
- Consultant design is effective but costly
- Cost analysis was positive
- Other practice opportunities arise
 - Oxbow restorations
 - Constructed Wetlands
 - Cover Crops
- You have to build a TEAM

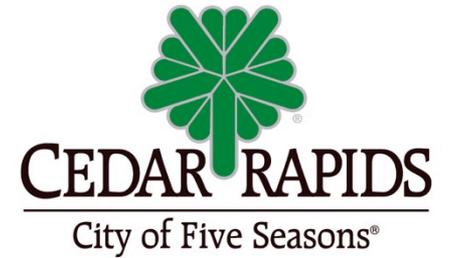


Thank You

...

John Swanson

Johnathon.swanson@polkcountyiowa.gov



Scaling Edge of Field Practices for Municipal Source Water Protection

Mary Beth Stevenson
Watersheds & Source Water Program Manager
Utilities Department
City of Cedar Rapids





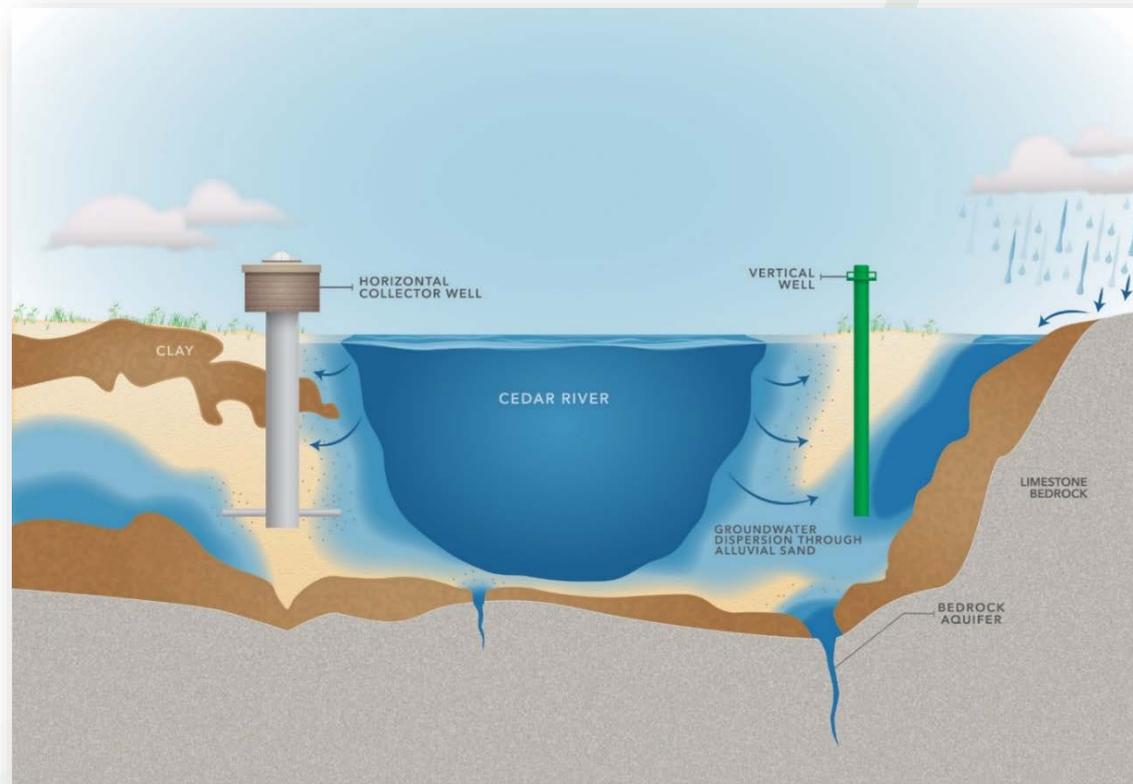
Watershed-Scale Challenges

- Source Water
- Flooding
- Tightening wastewater nutrient reduction permit requirements



Source Water Protection

Our source water comes from shallow alluvial wells that are strongly influenced by water quality conditions in the Cedar River

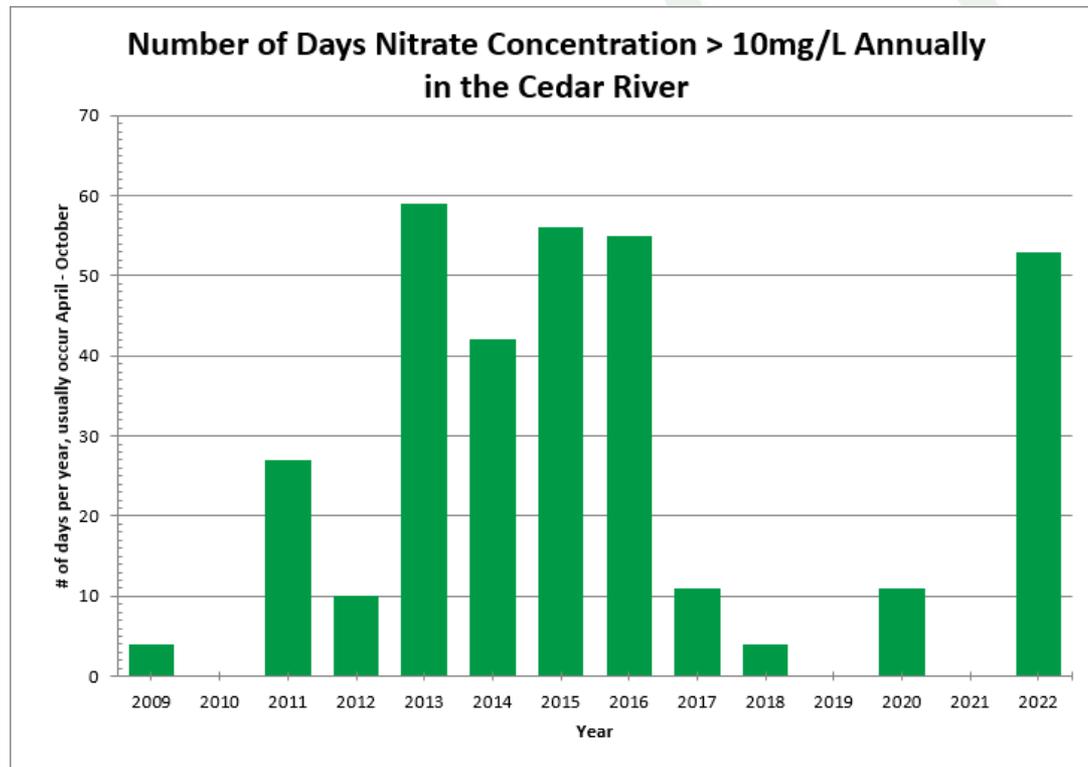


We produce 37 million gallons per day of high quality drinking water

Major industries such as PepsiCo, Cargill, and General Mills rely on our drinking water for processing agricultural products.



Water Quality Concerns - Nitrate



Days Nitrate Concentration Exceeds MCL in Cedar River

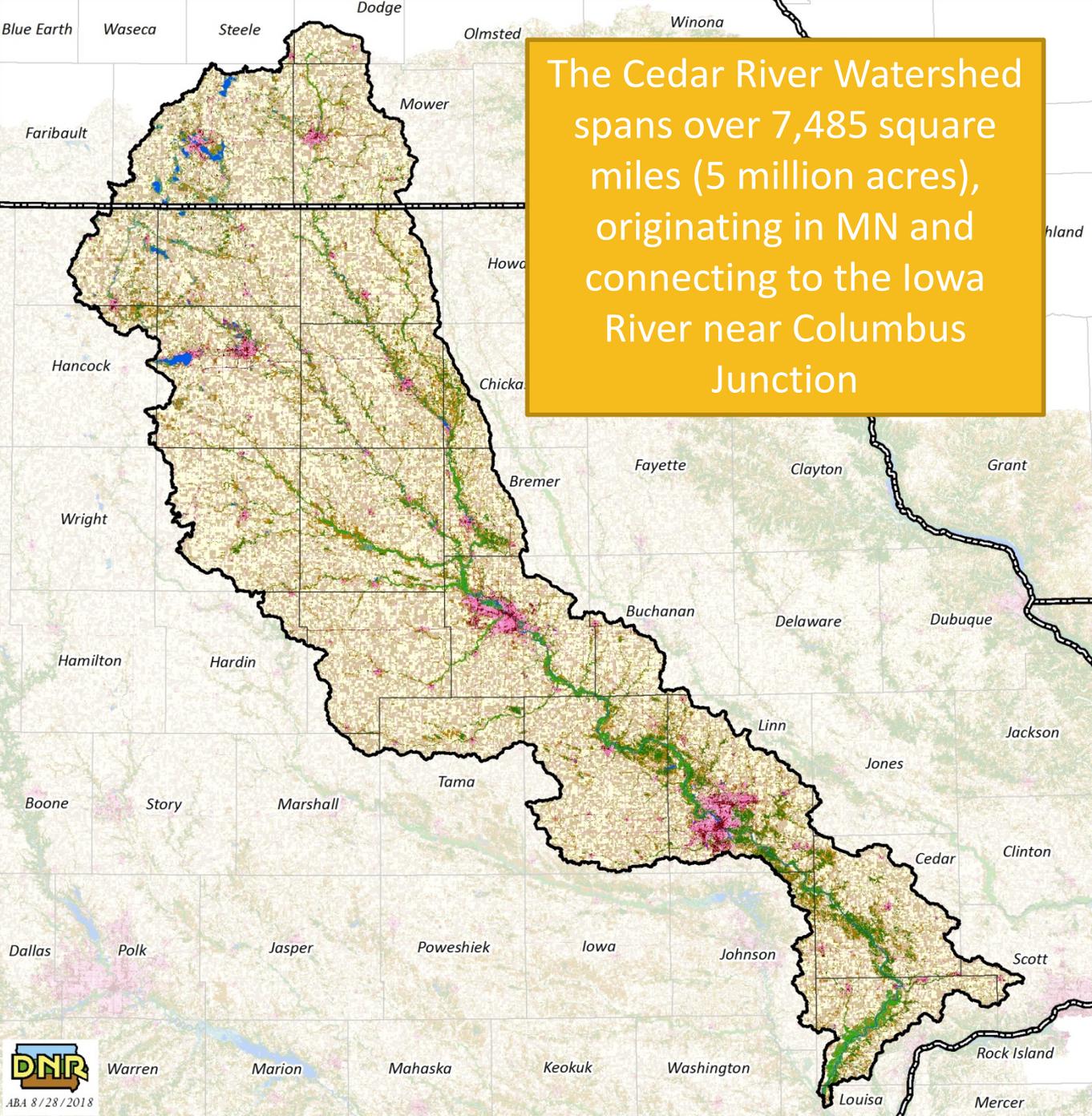
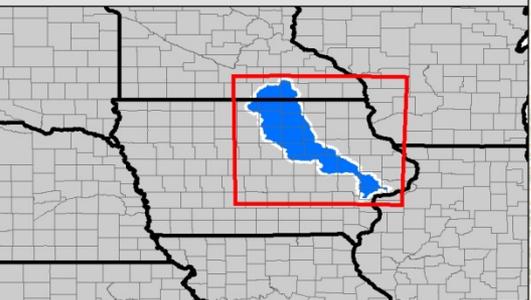
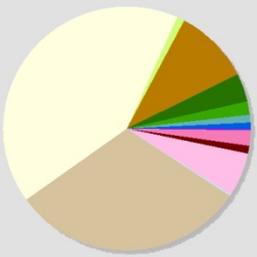


Cedar River Watershed 2017 Landcover

The Cedar River Watershed spans over 7,485 square miles (5 million acres), originating in MN and connecting to the Iowa River near Columbus Junction

Landcover (% of Watershed)

- Water (0.9%)
- Wetland (1.0%)
- Forest, Bottomland (1.8%)
- Forest, Coniferous (0%)
- Forest, Deciduous (3.8%)
- Grassland (9.9%)
- Alfalfa/Hay (0.9%)
- Corn (41.5%)
- Soybeans (31.0%)
- Other Rowcrop (0%)
- Roads & Lightly Developed Urban (6.0%)
- Intensively Developed Urban (1%)
- Residential/Moderately Developed (2.1%)
- Barren (0.1%)





Cedar River Watershed Batch & Build

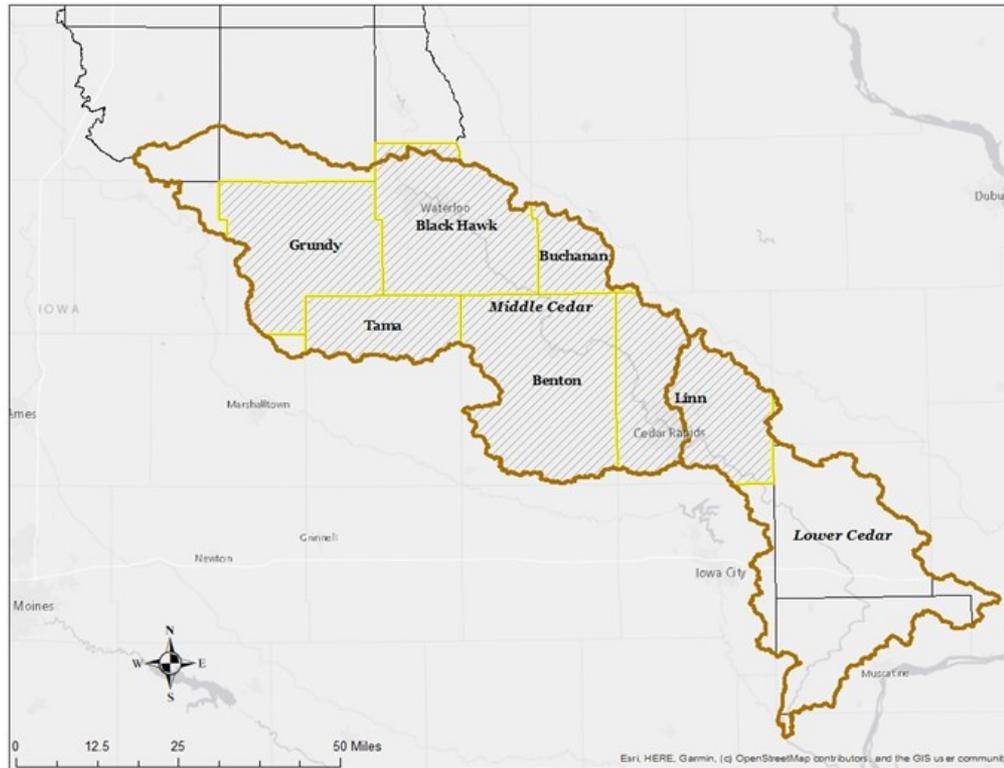
- Target Area: Middle Cedar Watershed
- A 6-county area
- Fiscal Agent - Cedar Rapids
- Phase 1 Goal: 100 outlets treated
 - 28 landowners participating
 - IDALS funds 100%
 - 5 batches





Cedar River

CLEAN WATER PARTNERSHIP



Boots on the Ground

- Cedar Rapids:
 - Watersheds & Source Water Program Manager
- Watershed Coordinators:
 - Rose Danaher, Benton-Tama WQI
 - Clark Porter, Miller Creek / Rock Creek WQI
 - Faith Luce, Black Hawk Creek WQI
 - Indian Creek Soil Health Coordinator
- IDALS Staff:
 - James Martin, Tanner Puls
- Others:
 - Technicians
 - Heartland Coop



Fiscal Agent Perspective

- Local governments are familiar with handling construction projects
- Bid-letting & Contracting: Purchasing Department
- Temporary Construction Easements: Real Estate Department
- Watershed Program: Partnerships and coordination





ABOUT THE PROJECT

The Iowa Department of Agriculture & Land Stewardship and local partners are scaling up efforts to implement the Iowa Nutrient Reduction Strategy to reduce nitrates lost through tile drainage. Saturated Buffers and Bioreactors have been identified as some of the most cost effective methods to improve water quality.

We have secured funding to install Saturated Buffers and Bioreactors at no cost to the landowners in the project area. Landowners will also receive a temporary construction easement payment of \$1,000 per qualified tile outlet.

PARTNERS

- City of Cedar Rapids
- Linn County
- Iowa Department of Agriculture & Land Stewardship
- USDA Natural Resources Conservation Service
- Benton, Black Hawk, Buchanan, Grundy, Linn, & Tama County Soil and Water Conservation Districts
- Heartland Coop
- Agricultural Drainage Management Coalition

CONTACT US



Clark Porter
Black Hawk & Buchanan Counties
Clark.Porter@iowaagriculture.gov
(515) 318-9857

Emery Davis
Linn County
Emerydavis7@gmail.com
(319) 212-0916

Rose Danaher
Benton & Tama Counties
Rose.Danaher@iowaagriculture.gov
(515) 776-2764

Faith Luce
Grundy County
Faith.Luce@ia.nacdn.net
(319) 243-3634



tinyurl.com/cedarrivercleanwater

BIOREACTORS

A bioreactor is a buried pit filled with a carbon source such as wood chips. Tile water is diverted into the pit where nitrates are removed during the decomposition process. When tile flow exceeds the bioreactor's capacity, excess water flows directly to the tile outlet ensuring that field tiles function appropriately. Wood chips may need to be replaced every 10-15 years to ensure maximum nitrate removal.

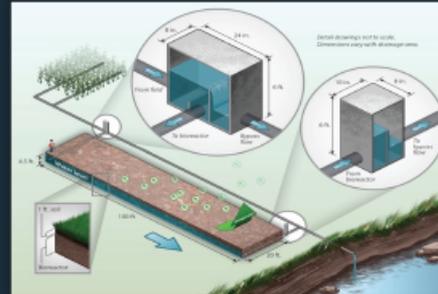
SITE REQUIREMENTS

Fields with tile systems draining
40-100 acres

AND

an existing grass area at the pit location (most pits are 1/10 an acre or less) or interest in adding a grass area (CRP rental payment available)

OUTLET WITH A BIOREACTOR



Bioreactors have an estimated life span of 10-15 years, at which point they can be recharged with fresh wood chips to ensure maximum nitrate removal.

SATURATED BUFFERS

A Saturated Buffer is a grass buffer where tile water is diverted to a lateral distribution line parallel to the stream. As water moves through the soil profile, nitrates are removed. In high flow conditions the water will bypass the lateral line and discharge directly into the stream to ensure that the field tiles continue to function appropriately.

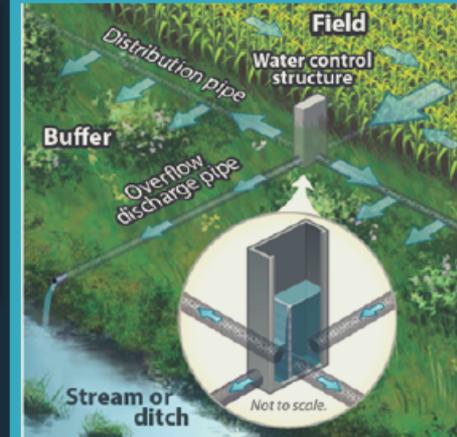
SITE REQUIREMENTS

Fields with tile systems draining at least 25 acres with an outlet to a waterway or stream

AND

30' minimum grass buffer along stream or interest in adding a grass buffer (CRP rental payment available)

OUTLET WITH A SATURATED BUFFER



BENEFITS OF BIOREACTORS AND SATURATED BUFFERS

Edge of field practices reduce nutrient losses from your farm with no annual expense and no changes to farm management. They are designed to ensure proper field drainage and work 24/7, 365 days a year.



We All Live Upstream of Someone Else: Every Acre Matters



Thank You!



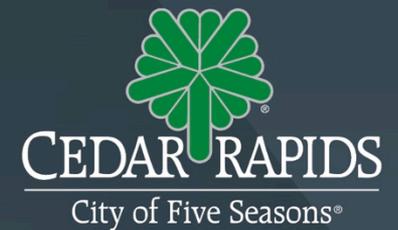
Presented by:

Mary Beth Stevenson

Watersheds & Source Water Program Manager

Mb.Stevenson@cedar-rapids.org

319-774-9117





Conservation Agronomist Network

Heath Ellison, CCA 4R NMS / SSp
Senior Field Services Program Manager
Iowa Soybean Association Research Center for Farming Innovation

Iowa Soybean Association

Vision

ISA is recognized for excellence in enhancing long term **sustainability** of Iowa soybean farmers.

Mission

The most **trusted partner** of Iowa's soybean farmers dedicated to expanding opportunities and delivering results.

Goal

Ensure the long-term **competitiveness** of Iowa soybean farmers.

Governance & Representation

Governed by a board of 22 farmers
Advocate on behalf of the state's 40,000 soybean producers

Represent more than 12,000 ISA farmer members

Invest & leverage the soybean checkoff



What is a conservation agronomist?

An agronomist dedicated to supporting conservation adoption by

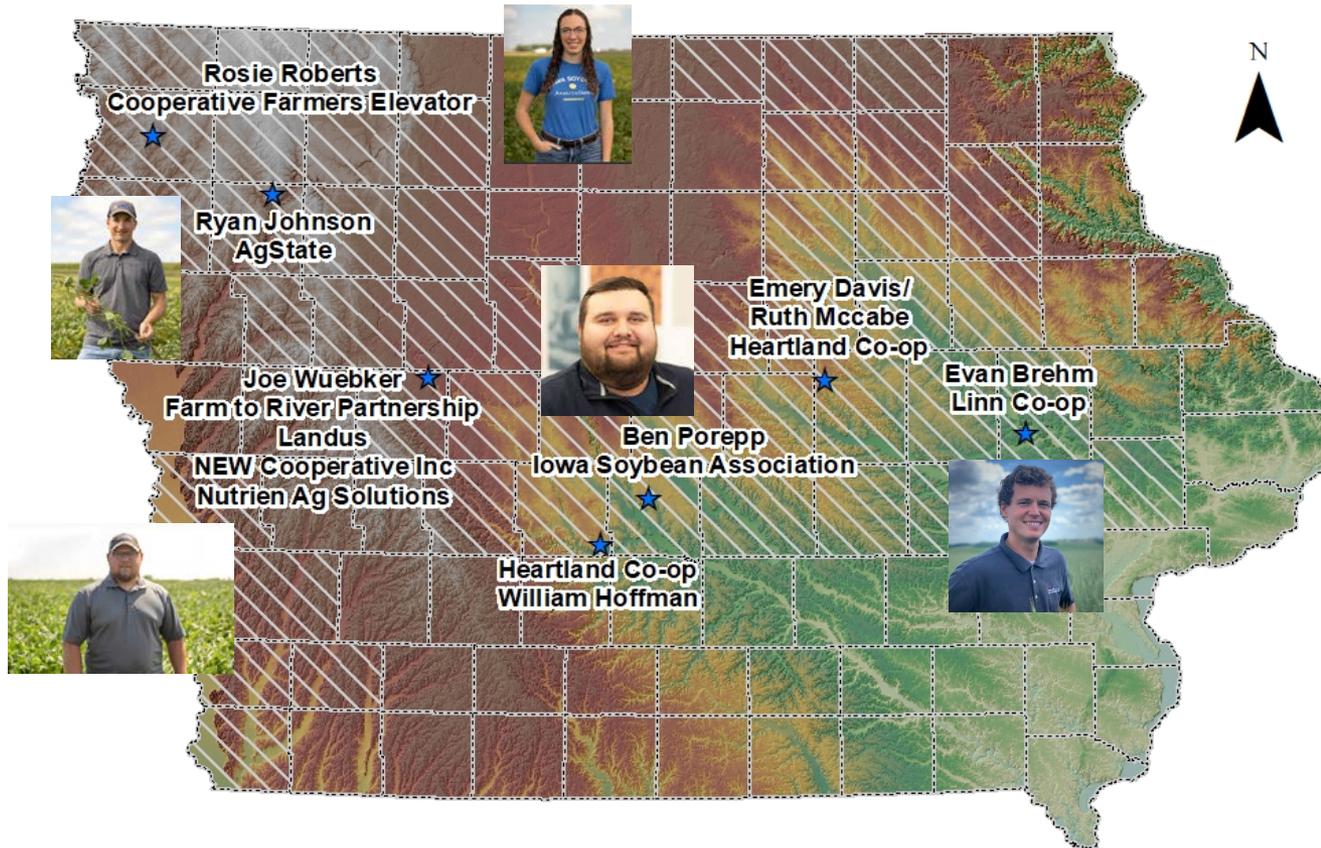
- Leveraging sales agronomist network
- Connecting farmers with resources
- Supporting practice implementation
 - Adjustments to cropping systems
 - Agronomic support
 - Connection to research
- Providing in house conservation expertise to ag retail partner

Who is

- Living and working locally
- Usually officed out of an ag retail partner's location
- Interfacing with local SWCD's, watershed projects, & other resources



Iowa Soybean Association Conservation Agronomist Network



Conservation Agronomist

- ★ Locations
- ▨ Service Area

Impact

- **Growth**
 - 2019 – 1 position
 - 2020 – 4 positions
 - 2021 – 6 positions
 - 2022 – 8 positions
- **Progress**
 - ~100 sales agronomists
 - 1030 farm visits
 - 7984 farmers reached through various outreach
 - Over 800 practice recommendations
 - 5194 acres improved nutrient management
 - 9037 acres no-till / strip-till adopted
 - 68 edge of field practices enrolled
 - 47,554 acres cover crop
- **Water Quality Impact**
 - 435,136 pounds Nitrogen loss reduced
 - 26,309 pounds Phosphorus loss reduced
- **Vision – in 5 years**
 - 20 conservation agronomists
 - Every ag retailer in Iowa has access to at least 1 conservation agronomist
 - Replicable model with demonstrated value to ag retail = ownership by ag retail
 - CA's responsible for 1 million acres of cover crop adoption in the next 5 years



Next Steps

- Expand Network
- Quantify Impact
- Develop how-to guidance for ag retail adoption





IOWA SOYBEAN
Association ✓

Thank You

hellison@iasoybeans.com
515 334-1045