UIRWMA | Agenda

Meeting date/time: 3/28/2019 *Business Meeting 5:00-5:45 PM Presentations 5:45* | **Meeting location:** *Winneshiek County Courthouse Annex building, 201 West Main St., Decorah.*

BUSINESS MEETING

1) Agenda topic: *Call Meeting to Order* | Presenter: John Beard

Action items	Motion	Second
Meeting called to order	Dan Byrnes	Jack Knight

2) Agenda topic: *Approval of Minutes 11/8/18 meeting* | Presenter: John Beard

Discussion:

Action items	Motion	Second
Approve Minutes from 11/8/19 meeting	Dan Byrnes	Jack Knight

3) Agenda topic: *UIR Resiliency Plan* | Presenters: Ross Evelsizer, Tori Nimrod, Lora Friest, and Brad Crawford

Discussion:

1. UIR Resiliency Plan Objectives 5&6
2. Quantified Goals for the UIR Resiliency Plan
3. UIR Resiliency Plan Draft

Ross and Tori went through online UIR Watershed Management Plan showing the advantages of having this as an online resource. Will be able to reach way more people, incorporate addition information platforms, and network in partnering agencies/groups that provide benefits to the watershed. Discussed adding additional information to sub-watersheds and having more specific sub-watershed goals, designating primary and secondary goals.

Website: upperiowariver.org

Action items	Motion	Second
1. Approval of UIR Resiliency Plan Objectives 5&6 a) Replace Strategy 3 of Objective 3 with Object 5 b) Adopt objective 6	Mark Jensen	Dan Byrnes
2. Approval of Quantified Goals for the UIR Resiliency Plan a) Adopt option 3 goal strategy and empower tech committee to provide guidance to refine measurable goals.	Andy Carlson	Dan Byrnes
3. 3. Adoption of the UIR Resiliency Plan Draft a) Draft will be available online at upperiowariver.org. Will be open for 30 days for public comment before becoming final.	Dan Byrnes	Andy Carlson

4) Agenda topic ***Utilizing Iowa Geological Survey for Geotechnical Investigation*** **| Presenter: Matt Frana**

Discussion: Whether to accept IGS's proposal for service.

Explained the option of using IGS's services on 3 potential road structure sites with underlying bedrock concerns to provide consultation on whether or not these projects should be passed on to Shive-Hattery for project planning and design.

Action items	Motion	Second
1) IGS proposal accepted. Board would want the project coordinator to ensure there is significant commitment from adjacent landowner(s) before exercising this option to prevent unnecessary spending.	Mark Jensen	Andy Carlson

5) Agenda topic: ***Set Next Meeting Time/Date and Adjourn Business Meeting*** **| Presenter: John Beard**

Discussion:

Action items	Motion	Second
Meeting Date: Tuesday, June 11th Location: Winneshiek County Annex Building	Jack Knight	Dan Byrnes

Presentations:

Iowa Flood Center/ IIHR-Hydroscience & Engineering:

- ***Antonio Amado*** *- Antonio will provide the summary of the Upper Iowa River Hydrologic Assessment Report, 2018 rainfall data, and recent snowfall/flooding outlook.*

Upper Iowa River WMA Coordinator Update:

- ***Matt Frana*** *– Project Update*
  - ***2019 Project sites***

Upper Iowa R
Watershed Management Au

UPPER IOWA RIVER
WATERSHED MANAGEMENT AUTHORITY MEETING

Date: 3.28.19

Name	Organization/Entity	Email	Mailing Address	Phone #
1 Kate Giannini	Iowa Flood Center			
2 Antonio Arenas	Iowa Flood Center			
3 Valerie Decker	U of I CEA			
4 Cathy & Denny Evelsizer	—			
5 Ryan Clark	Iowa Geological Survey			
6 Larry Grimstad				
7 Michelle Barness	Upper Explorerland Regional Planning C.			
8 Rachel Brummel	Luther			
9 Matt Frana	SWCD			
10 John Beard	WMA			
11 Ross Evelsizer	RC+D			
12 Mark Jensen	WMA			
13 Dan Byrnes	WMA			
14 Andy Carlson	WMA			
15 Lora Friest	RC+D			
16 Brad Crawford	RC+D			
17 Tori Nimrod	RC+D			
18 Todd Duncan	NRCS			
19 Jim Marwedel	Iowa Homeland Security			
20 Jack Knight	WMA			

RC&D Agenda Item 3-1

Additional Objectives and Strategies for Review – Upper Iowa WMA

Objective 5: Build the UIR WMA's Long-term Capacity to Operate and Implement Projects

- Strategy 1: Support UIR WMA participation in *WMA's of Iowa* meetings and events.
- Strategy 2: Support UIR WMA participation in *WMA's of Iowa* Board and *WMA's of Iowa* committees.
- Strategy 3: Periodically develop, implement and analyze UIR WMA Watershed Resident Surveys to better understand public perception and attitudes, assess the UIR WMA's impact on the watershed and to inform future WMA and partner work.
- Strategy 4: Set aside time annually for the UIR WMA Board to plan for and discuss future WMA activities, funding and sustainability.
- Strategy 5: Educate legislators about the need for WMA funding, and advocate for legislation that provides for a watershed approach to address significant flood and water quality protection.
- Strategy 6: Identify and pursue grants, partnerships, and other means for sustaining funding for flood reduction projects in the UIR Watershed.

Objective 6: Evaluate the Watershed Authority's effectiveness and use the evaluation to inform future UIR WMA work.

- Strategy 1: Develop measurable, defined objectives for overall WMA effectiveness that can and are reviewed annually.
- Strategy 2: Evaluate the overall participation and accomplishments of the WMA partners on an annual basis, based on the agreed upon measurable, defined objectives.
- Strategy 3: Incorporate and review *Evaluation Parameters* for each Objective and Strategy included in the UIR WMA plan.
- Strategy 4: Evaluate the effectiveness of the paid coordinator, and the UIR WMA's need for and employment structure of UIR WMA staff.
- Strategy 5*:* Develop and distribute an annually update to the UIR WMA Plan, that includes a summary of all evaluations, updated measures for objectives and strategies based on those evaluations, and overall recommendations for UIR WMA efforts in the next year.

RC+D Agenda Item 3-2

Setting Measurable Goals

Note: This is a 20-year plan. Goals can be set in increments (5, 10, 15, 20 years) or for the life of the plan – 20 years.

Option 1

- Measurable BMP goals will be established for the entire UIR Watershed.
- The goals will not be specific to HUC 12 subwatersheds.
- Different types of projects may be implemented by many different partners to help reach the goals for the whole watershed.
- Goals may include hydrologic benchmark/s, such as reaching a specific reduction in flow at different locations along the river after a certain rainfall amount (Bluffton, Decorah, Dorchester). They might concentrate on reducing flow at only one point on the UIR, (Dorchester).
- The Iowa Nutrient Management Strategy Goals could be used as the basis for nitrogen and phosphorous reduction goals in the UIR at a certain point where flow and nutrients are already measured.
- Establishment of goals would consider the research and analysis, such as the BMP, ACPF, Cover Crop Analysis, Hydrologic Assessment and other watershed-wide assessments, for the entire UIR Watershed.

What I like about this option:

What I dislike about this option:

Option 2

- Measurable BMP goals will be established for all HUC 12 subwatersheds.
- Goals will be standardized.
- Goals will include establishment of potential practices as well as maintainance of *existing* practices.
- The same data would be used that is used for Option 1 – data for the UIR Watershed rather than for individual watersheds.

What I like about this option:

What I dislike about this option:

Agenda Item 3-2

Option 3

- Measurable BMP goals will be established for all HUC 12 subwatersheds.
- Goals will be specific/unique to HUC 12 subwatersheds.
- Goals will be based on subwatershed characteristics such as
    - Location within the watershed
    - Landuse and topography
    - Karst Features
    - Research and analysis by HUC 12 (BMP, ACPF, Cover Crop, Hydrologic Assessment, etc.)
- County SWCD, Engineer, EM and other input specific to the subwatersheds will be considered.

What I like about this option:

What I dislike about this option:

Option 4

- Measurable BMP goals will be established for the UIRW by Objective and/or Strategy
- Goals will reflect research and analysis related to each specific strategy and or state and organizational recommendations by Strategy.
- Goals may focus more on one strategy than another.
- Goals will not be specific to HUC 12s.

What I like about this option:

What I dislike about this option:

My vote for option by order of preference (Enter option number):
1st Choice___________ 2nd Choice___________ 3rd Choice__________ 4th Choice___________

A different option I like better:

IOWA GEOLOGICAL SURVEY IIHR Hydroscience & Engineering THE UNIVERSITY OF IOWA
300 Trowbridge Hall, Iowa City, Iowa 52242 319-335-1575 www.iowageologicalsurvey.org

March 4, 2019

Agenda Item 4

Matthew Frana
Upper Iowa Watershed Project Coordinator
Winneshiek County Soil & Water Conservation District
2296 Oil Well Road
Decorah, Iowa 52101

RE: Upper Iowa River Watershed Flood Mitigation Site Characterization Study

Dear Mr. Frana,

Thank you for the opportunity to prepare this preliminary proposal to provide assistance in characterizing potential water retention sites in selected parts of the Upper Iowa River Watershed. This preliminary proposal was prompted by several telephone and email conversations between staff at the Iowa Geological Survey (IGS) and yourself regarding sites that are potentially beneficial to the project but have concerns based on initial assessments.

Purpose

Based on the information provided to the IGS (Upper Iowa Project Site Summary and UI Project Info for IGS, sent via email on 12/20/2018), there are three (3) sites that have been identified as potential water retention areas adjacent to existing road structures (Figure 1). The purpose of this work would be to provide the Upper Iowa Watershed Management Authority (Client) and Shive-Hattery (consulting engineer) with additional information relating to the geologic aspects of each site so the Client and consulting engineer can make informed decisions regarding the viability of these sites. The IGS proposes a phased approach to this project. Each of the phases are described in the following sections.

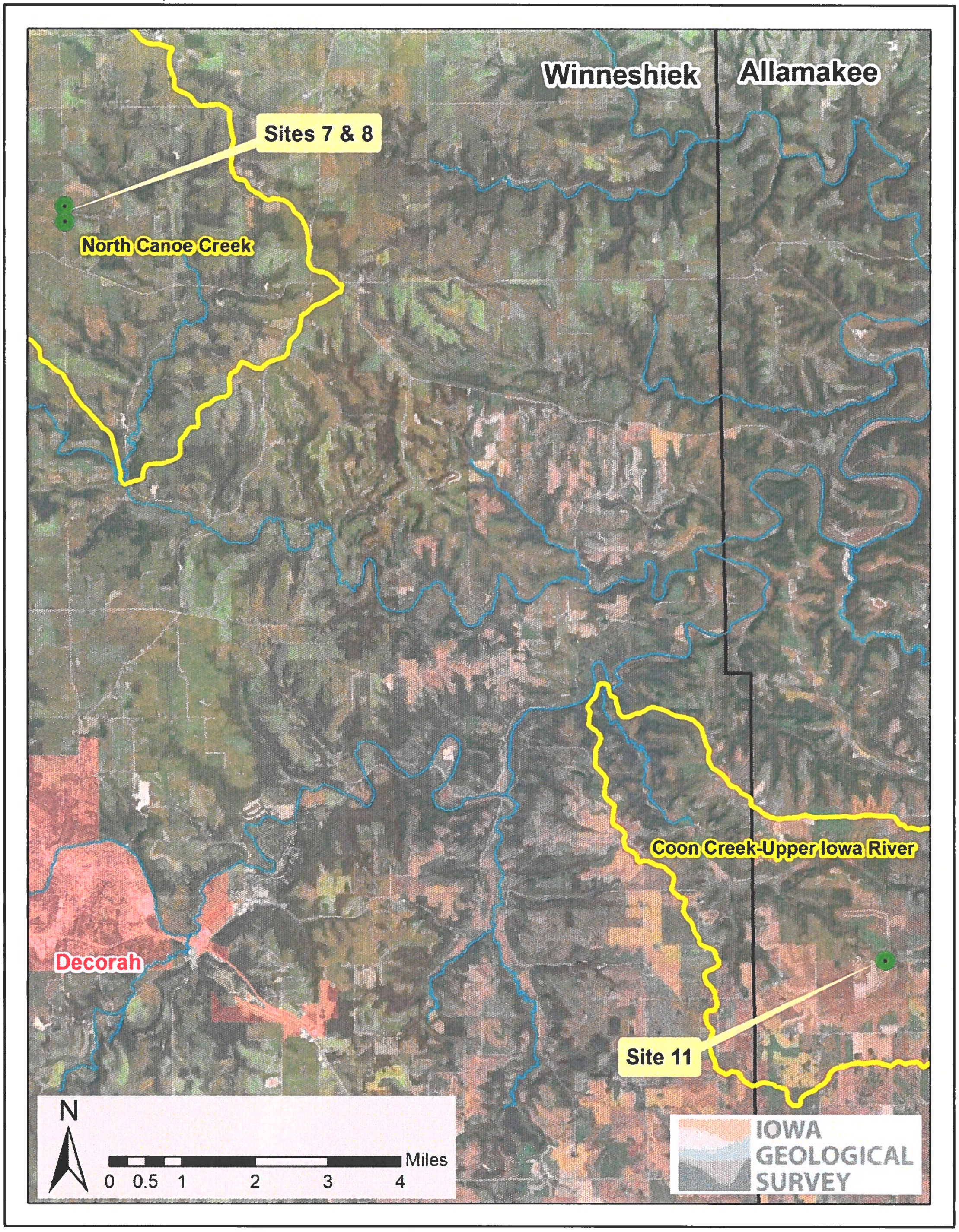

Figure 1: Vicinity map showing the locations of Sites 7, 8, &11 that were identified as needing further investigation.

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Phase 1: Desktop Geologic Review

The IGS will conduct a desktop review of all available geologic information including, but not limited to, the following sources:

- IGS GeoSam and GeoCore databases
- NRGIS Library
- Maps, reports, and other published information housed in the IGS Publications database as well as any unpublished "in house" printed and/or digital information

The purpose of the desktop geologic review is to glean as much information as possible from available sources to better understand the geology of the sites. If necessary, detailed maps depicting the surficial and/or bedrock geology, depth to bedrock, bedrock topography, and any other pertinent features will be constructed and provided to the Client. Based on the information generated during the desktop geologic review and recommendations by the IGS, the Client may elect to proceed to Phase 2.

Phase 2: Geophysical Field Methods

Upon completion of Phase 1, the IGS will conduct geophysical surveys of the sites. The method of the surveys as well as the locations of the surveys will be determined based on the results of Phase 1 and the recommendations of the IGS in consultation with the Client. The methods are described below.

Electrical Resistivity (ER) Imaging – this method involves laying out a cable in a straight line that is connected to electrodes that are hammered into the ground at equal spacing. The length of the line will dictate to what depth the survey will reach (longer lines = deeper survey). This method produces a two-dimensional characterization along the line, however the IGS does have the capability to collect and interpret three-dimensional data. The ER survey should provide

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a more comprehensive model of the depth to bedrock across the site and potentially identify anomalies such as voids and/or fractures in the shallow bedrock.

Electromagnetic (EM) Terrain Conductivity – this method involves walking the site in a grid pattern with the equipment. The data generated provides a "map view" of the site that will identify lateral variations in the surficial geologic materials. The EM survey is capable of imaging the subsurface to a depth of about 20 feet.

The IGS recommends only conducting the ER imaging survey because the surficial materials at the proposed sites are estimated to be approximately 15 feet thick and may not affect the overall assessment of the viability of the sites. The estimated costs for the geophysics does not include EM, however costs for EM may be provided to the Client upon request. The data generated by the surveys will be interpreted and compiled in a report that will be submitted to the Client within a timeframe that is agreed upon by both the IGS and the Client. Based on the results of Phase 2, the Client may elect to proceed to Phase 3.

The IGS will utilize an Advanced Geosciences, Inc. (AGI) SuperSting R8 electrical resistivity meter for this investigation. All data will be processed using AGI EarthImager 2D.

Geophysical Limitations

Electrical geophysical methods model how the subsurface responds to electrical charge. These methods provide the best results on undisturbed, natural ground. Data quality can become compromised when surveyed near: underground and overhead utilities, drainage structures, surface and subsurface metal, inhomogeneous fill materials, etc. Every attempt will be made to keep lines away from these features.

Electrical geophysical methods are the most beneficial when there is significant electrical contrast between the subsurface target and its surroundings. Geophysical results represent an

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area generally beneath each transect and may not represent what lies in areas not covered by the geophysical survey.

Phase 3: Test Drilling

Upon completion of Phase 1 and 2, the Client and consulting engineer will determine if 1) test drilling is needed and, if so 2) whether the IGS or another drilling contractor will perform the test drilling.

If test drilling is deemed necessary and the IGS is selected to perform the drilling activities, the IGS will perform test drilling at each selected site in order to confirm the depth to bedrock and to better characterize the surficial materials at each site. Characterizing the surficial materials will be performed by IGS geologists and/or soil scientist who will classify each material type, their relative thickness, and any other pertinent characteristics. The drilling operations will be conducted by the IGS using our truck-mounted Giddings rig. The method of drilling and sampling will be determined by the IGS after consultation with the Client and consulting engineer.

IGS Test Drilling Limitations

The proposed drilling and sampling activities will not include collecting Shelby Tube samples, performing Standard Penetration Tests, or classifying the materials in accordance with the Unified Soil Classification System. The Client or consulting engineer can elect to have material samples described by an engineer either during drilling activities or collect samples to be described at another time.

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Results and Deliverables

The IGS anticipates producing maps of each site and surrounding areas that will illustrate the depth to bedrock, bedrock lithology, bedrock formation, surficial geologic materials (if applicable), land surface elevation, geophysical survey locations, drilling locations, and any other pertinent information.. The IGS will compile all the data collected throughout the project into a final report for each site. The reports and all acquired data will be submitted to the Client within an agreed upon timeframe.

Site Characterization Study Costs for One Site

Phase 1: Desktop Geologic Review	$3,500
Phase 2: Geophysical Surveys (4 – 500' lines, ER only)	$8,000
If deemed necessary by the Client and consulting engineer	
Phase 3: Test Drilling (4 – 20' deep holes, flight auger only)	$3,000

Please let us know if you have any questions or comments related to this proposal. The above costs are estimated for one site. We look forward to working with you on this project!

Sincerely,

Ryan Clark, P.G.
Geologist

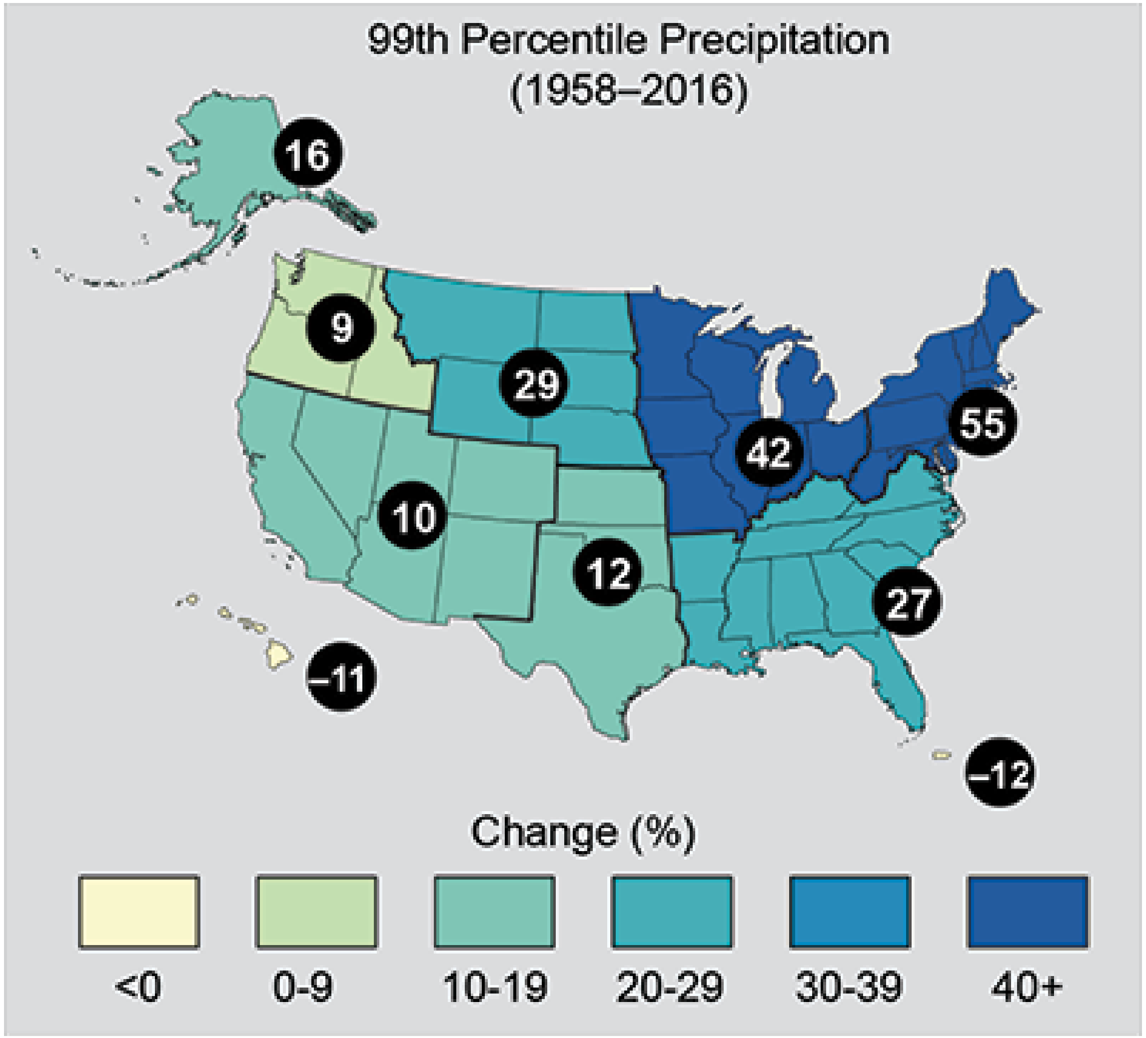
Agenda Item 4

A vision for a more resilient Iowa

The Iowa Watershed Approach

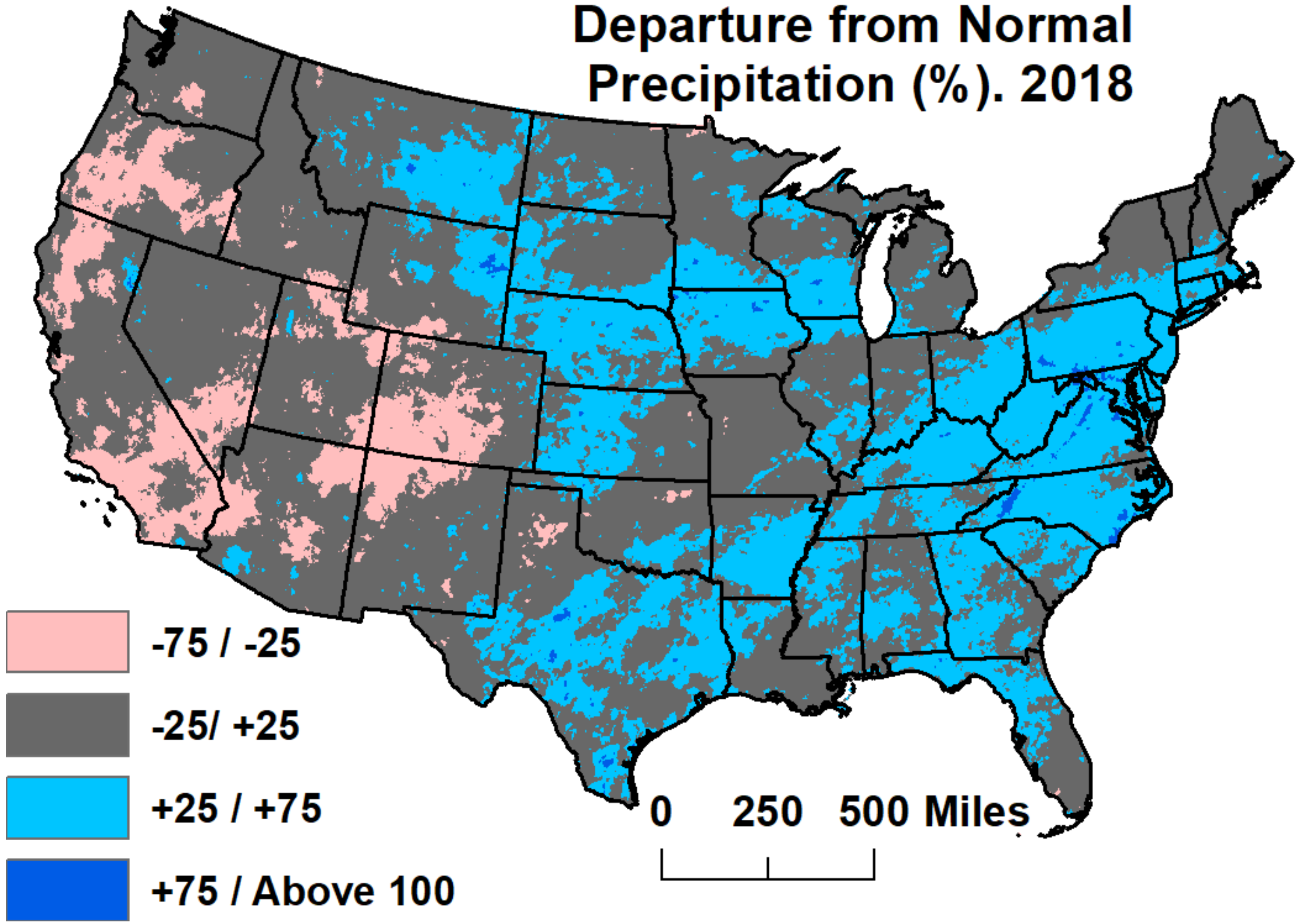
Antonio Arenas
Assistant Research Engineer
antonio-arenasamado@uiowa.edu

The University of Iowa College of Engineering
IIHR Hydroscience & Engineering
Iowa Flood Center



Observed change in heavy precipitation (the heaviest 1%) between 1958 and 2016. Figure taken from The Climate Science Special Report (Easterling et al. 2017) (https://science2017.globalchange.gov/).

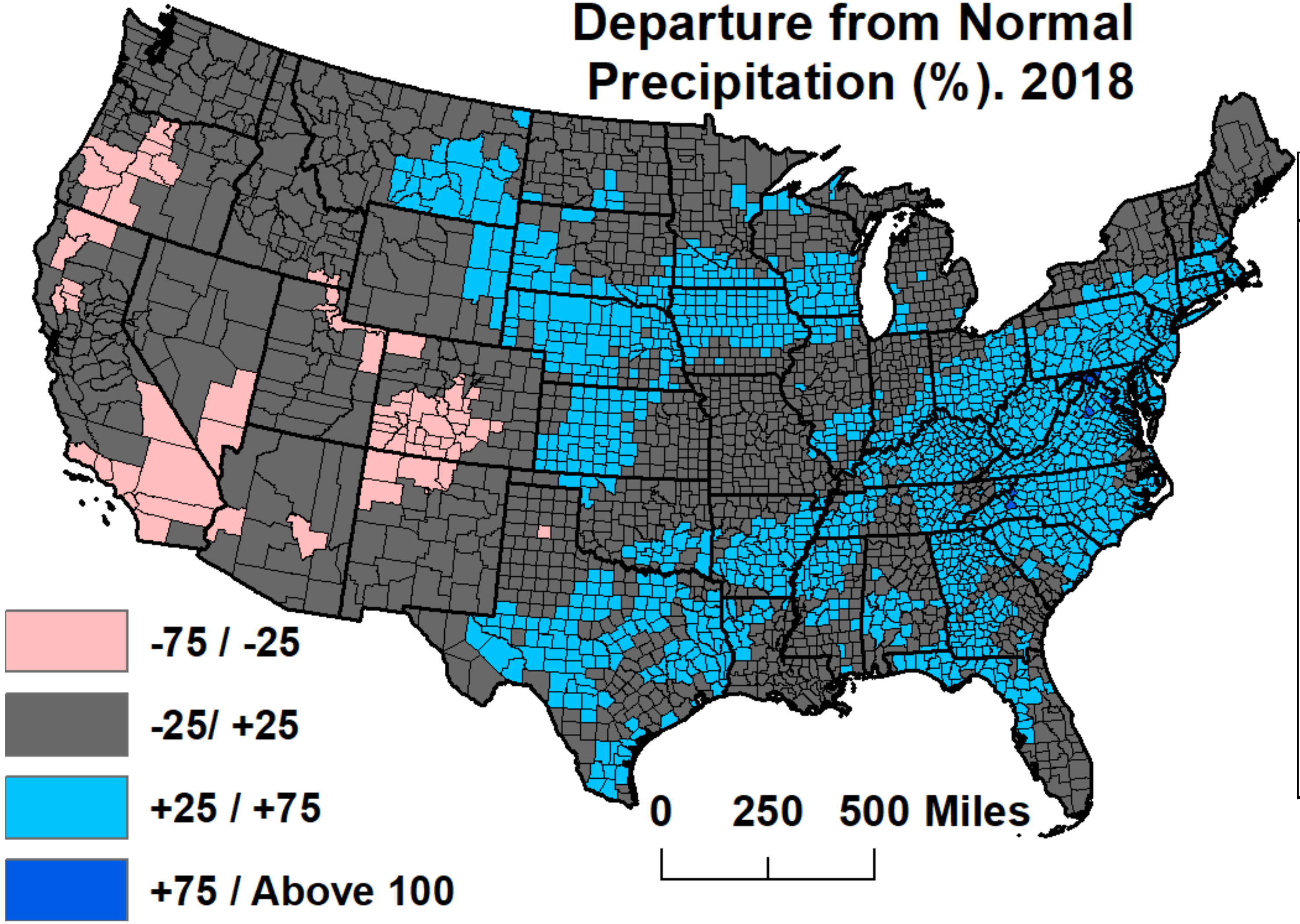
Departure from Normal Precipitation (%). 2018



$$\frac{\mathbf{Rain}_{2018} - \mathbf{Rain}_{1981-2010}}{\mathbf{Rain}_{1981-2010}} x100$$

(Raw data source: http://www.prism.oregonstate.edu/).

Departure from Normal Precipitation (%). 2018



Rank*	County	Mean Departure (%)
16	Osceola	73.5
26	Chickasaw	70.6
28	Dickinson	70.3
39	Bremer	69.0
47	Floyd	67.6
56	Lyon	66.4
64	Emmet	65.2
65	Hancock	65.1
70	Butler	64.4
77	Sioux	63.5
85	Wright	62.9
93	Webster	62.4
99	Cerro Gordo	61.9
106	Franklin	60.7
148	Winneshiek	58.0
151	O'Brien	57.6
161	Allamakee	57.2

*calculated with data from about 3200 counties

$$\frac{\text{Rain}_{2018} - \text{Rain}_{1981-2010}}{\text{Rain}_{1981-2010}} x100$$

(Raw data source: http://www.prism.oregonstate.edu/).

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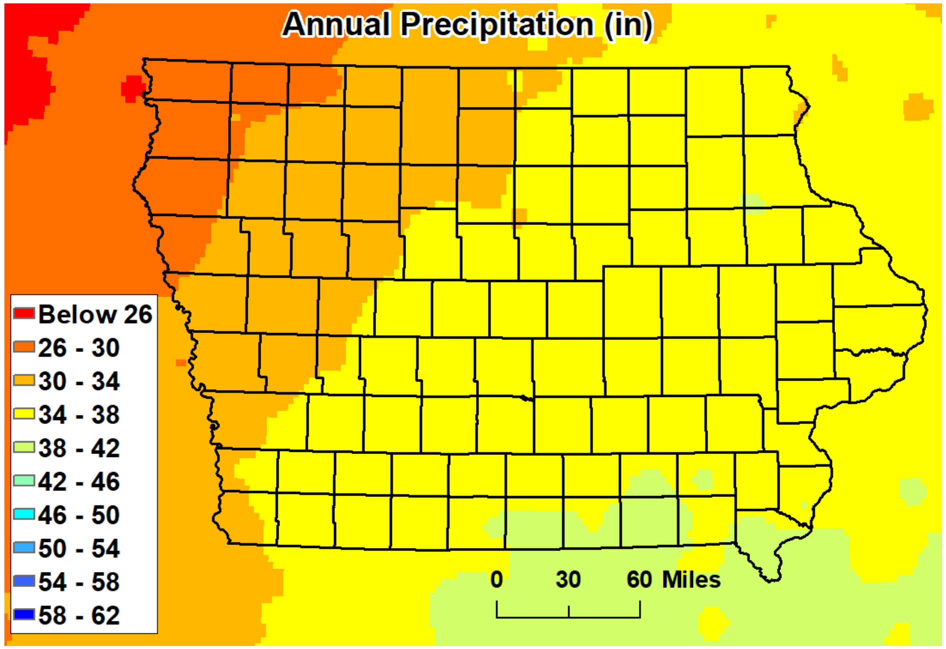
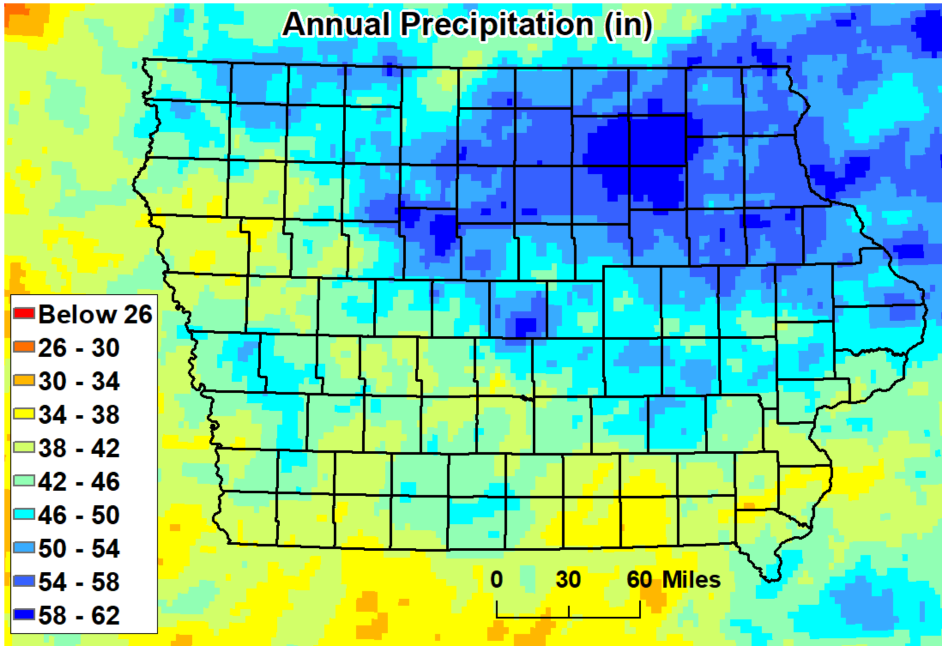
Normal. Estimates are based on the 30-year annual average (1981-2010).

2018





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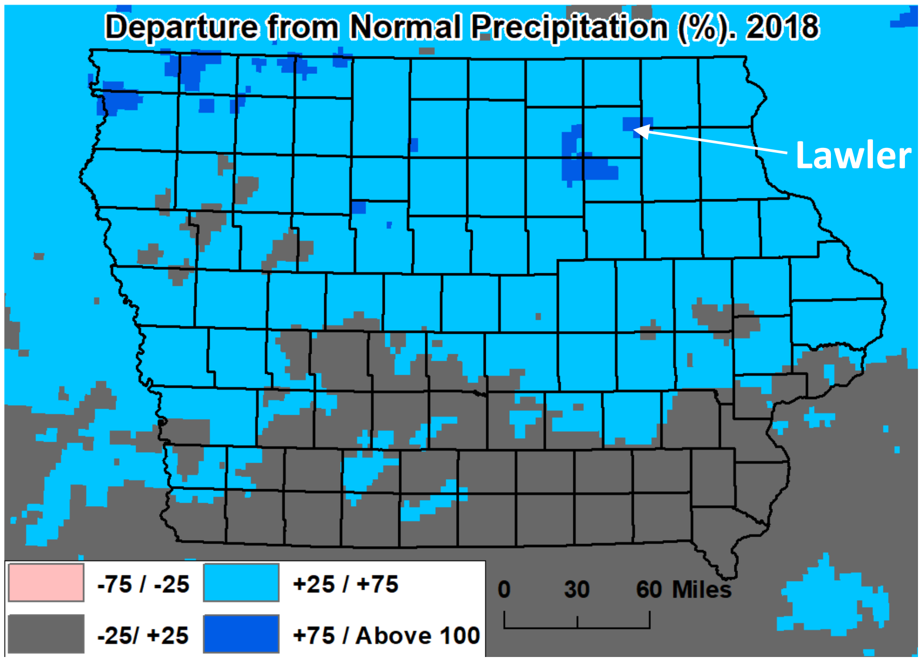
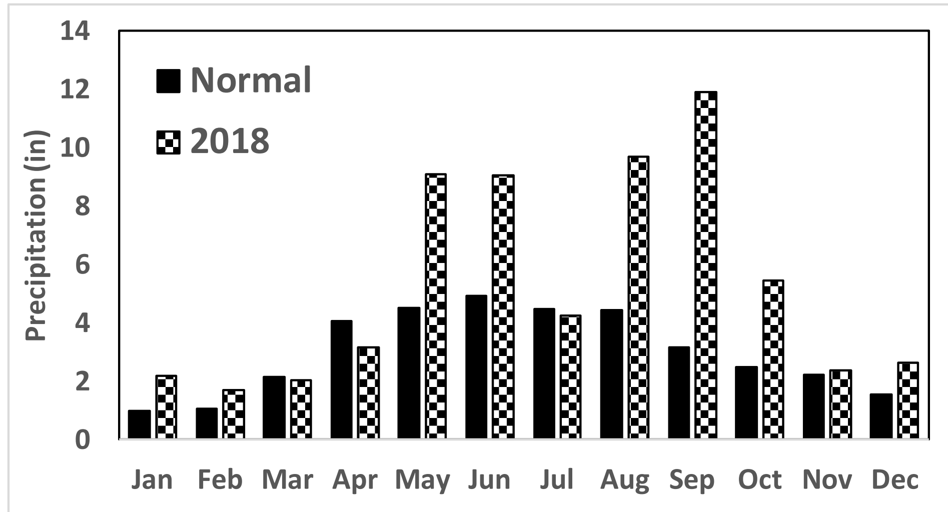
(Raw data source: http://www.prism.oregonstate.edu/).

Data at Lawler. 2018

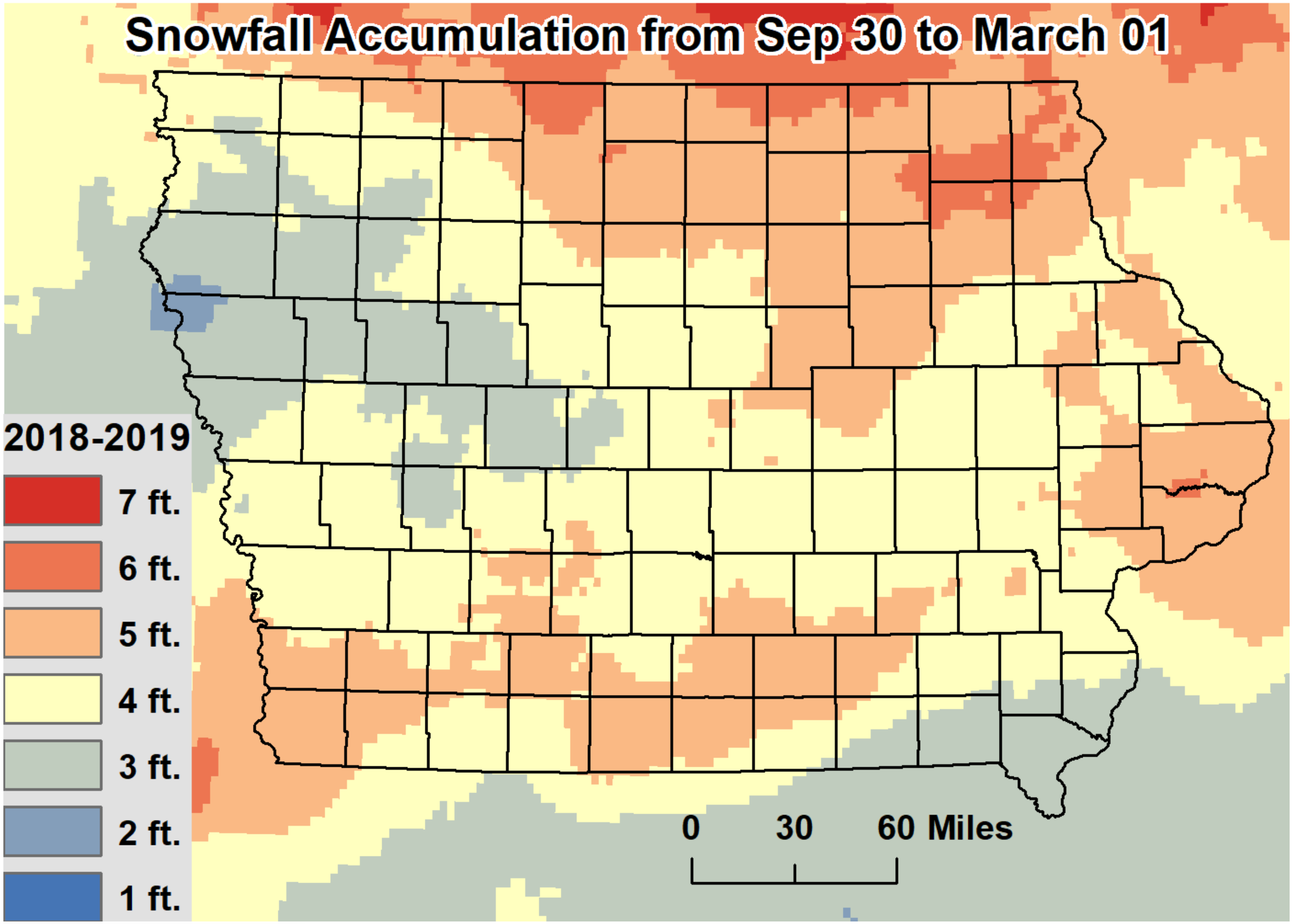




- **Departure from Normal: 77%**
- **Rainiest September since 1895 (PRISM: 12")**
- **Wettest year since 1895 (PRISM: 63.5")**

$$\frac{\mathbf{Rain}_{2018} - \mathbf{Rain}_{1981-2010}}{\mathbf{Rain}_{1981-2010}} x100$$

(Raw data source: http://www.prism.oregonstate.edu/).



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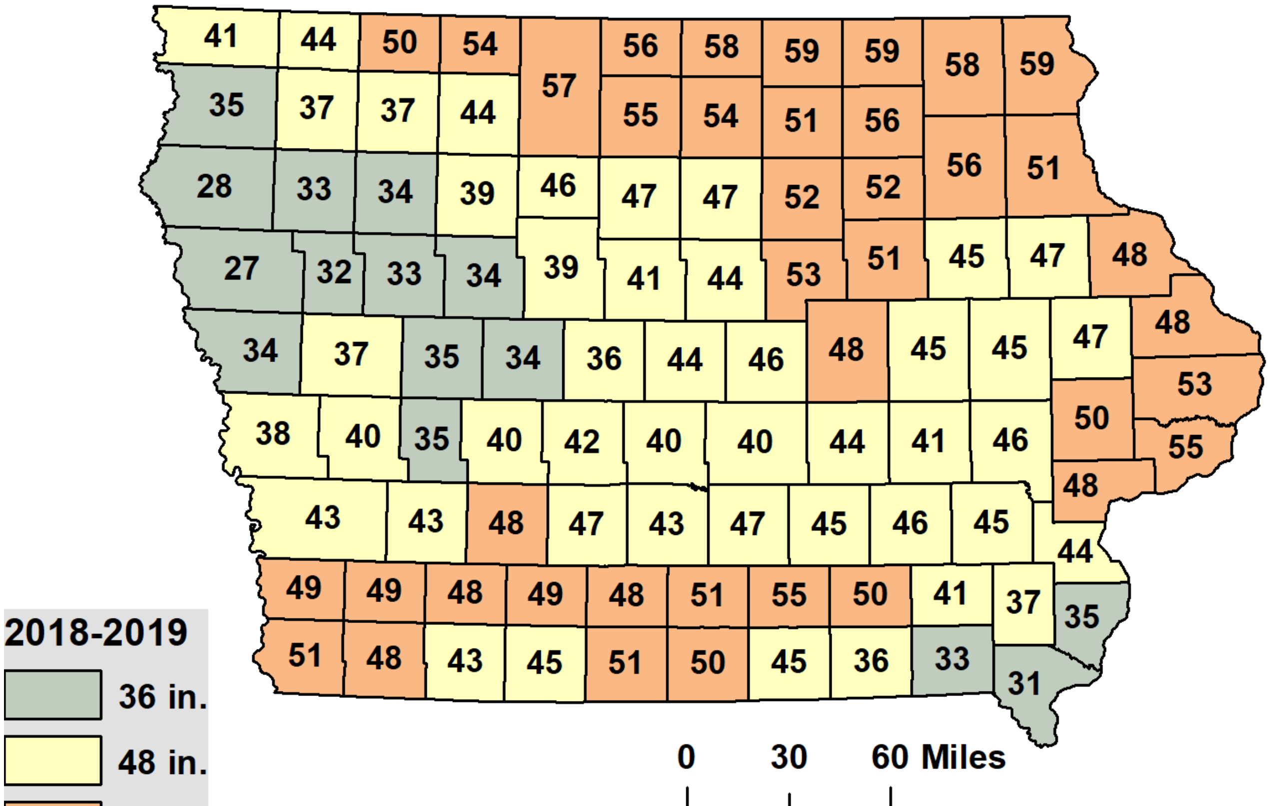
(Raw data source: https://www.nohrsc.noaa.gov/snowfall_v2/)

Snowfall Accumulation from Sep 30 to March 01



Rank	County	Snowfall (inches)
1	Howard	59
2	Allamakee	59
3	Mitchell	59
4	Winneshiek	58
5	Worth	58
6	Kossuth	57
7	Chickasaw	56
8	Winnebago	56
9	Fayette	56
10	Hancock	55
11	Monroe	55
12	Scott	55
13	Cerro Gordo	54
14	Emmet	54
15	Clinton	53

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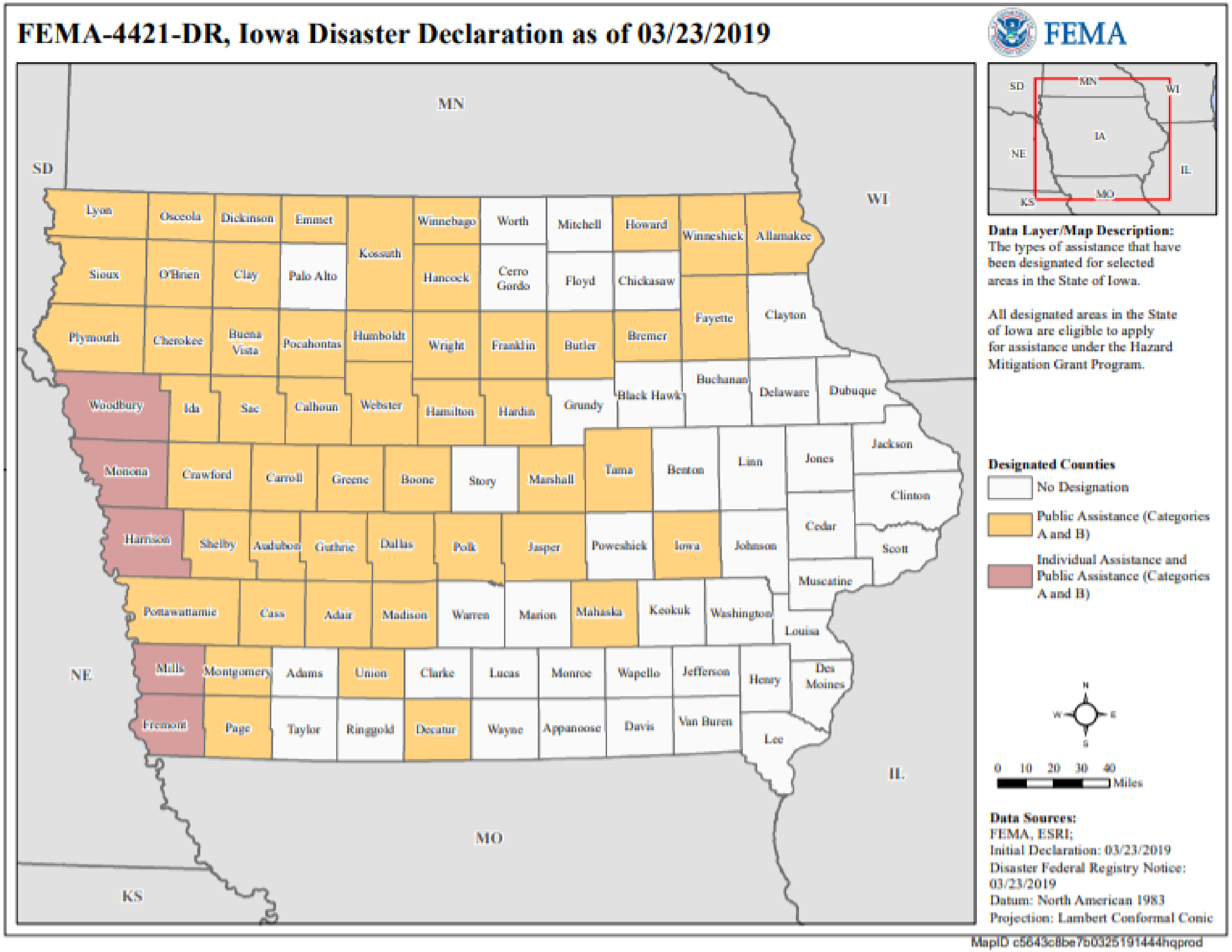
(Raw data source: https://www.nohrsc.noaa.gov/snowfall_v2/)



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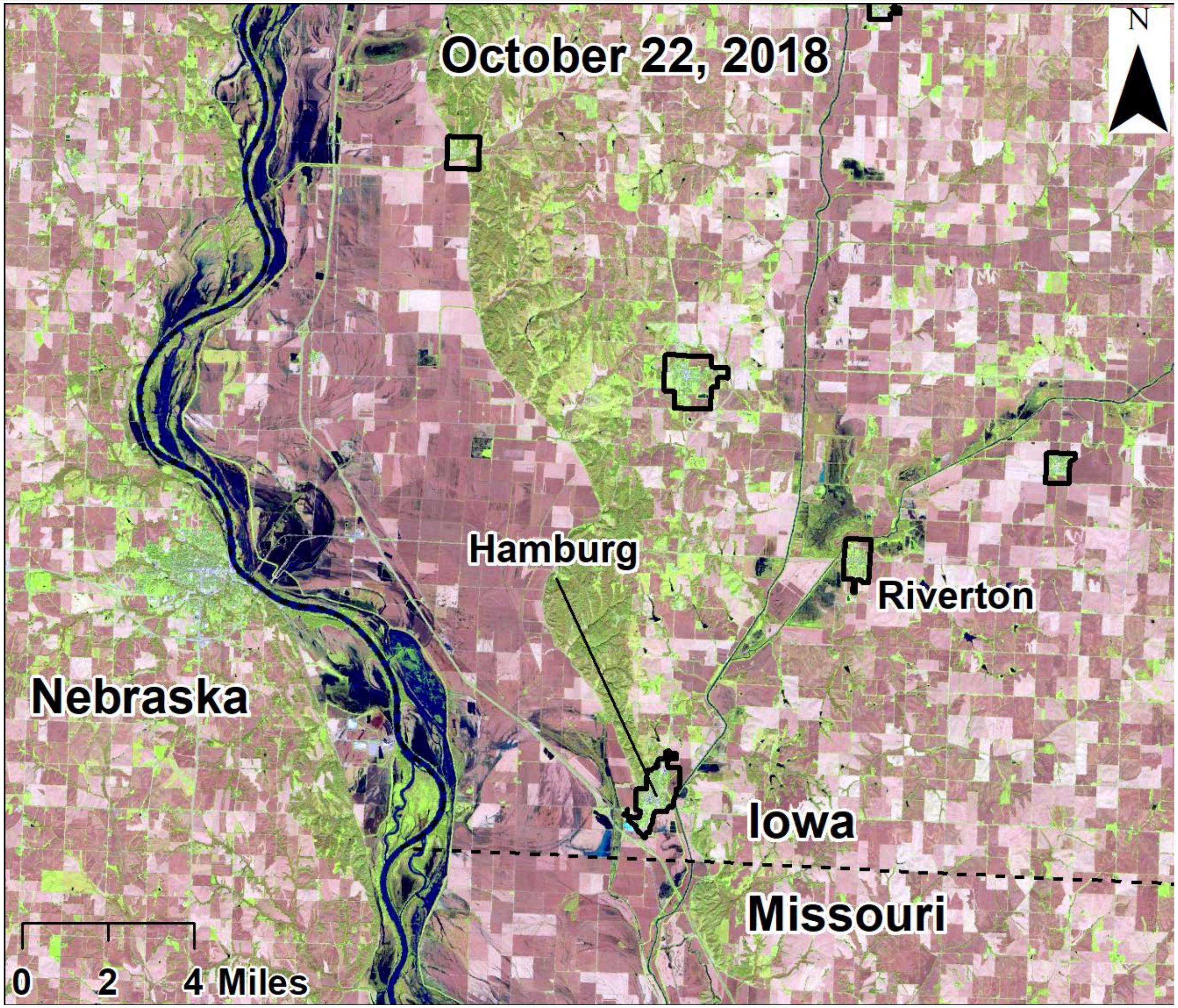
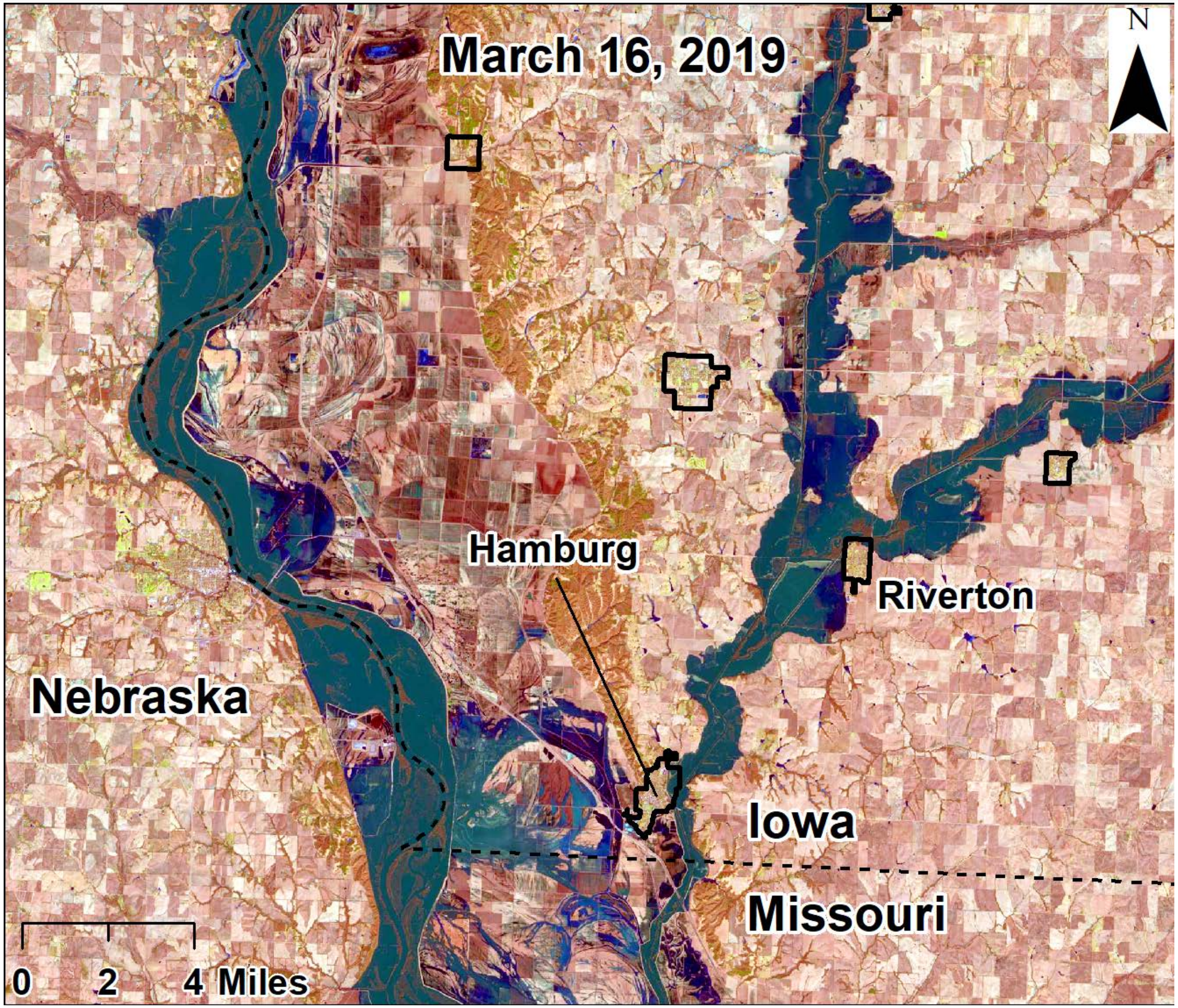
Nishnabotna River above Hamburg. Mean daily flow: 4,350 cfs.



Raw data: Sentinel-2 data downloaded from https://earthexplorer.usgs.gov/

Nishnabotna River above Hamburg. Mean daily flow: 34,300 cfs.



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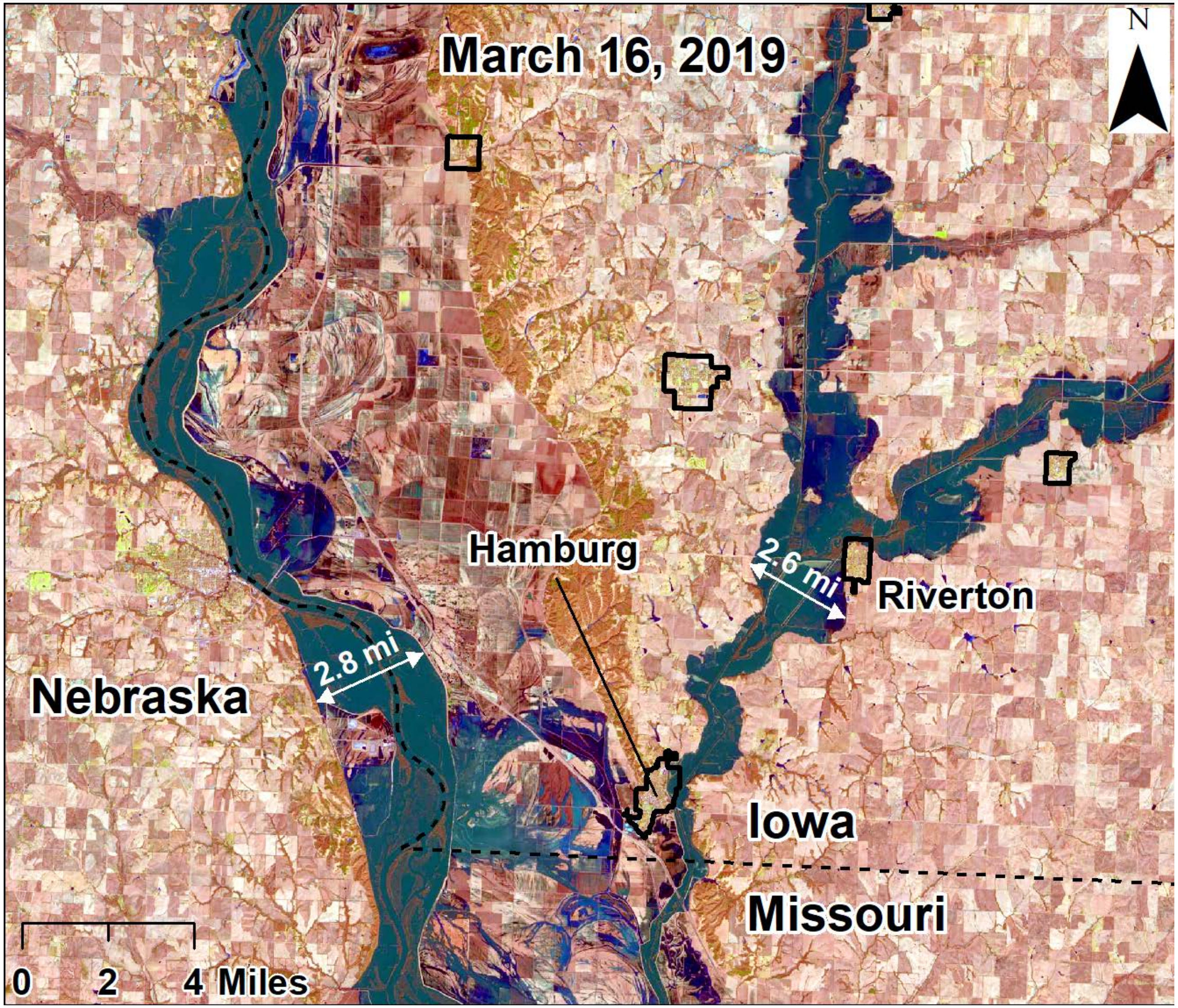
Raw data: Sentinel-2 data downloaded from https://earthexplorer.usgs.gov/

Nishnabotna River above Hamburg. Mean daily flow: 34,300 cfs.



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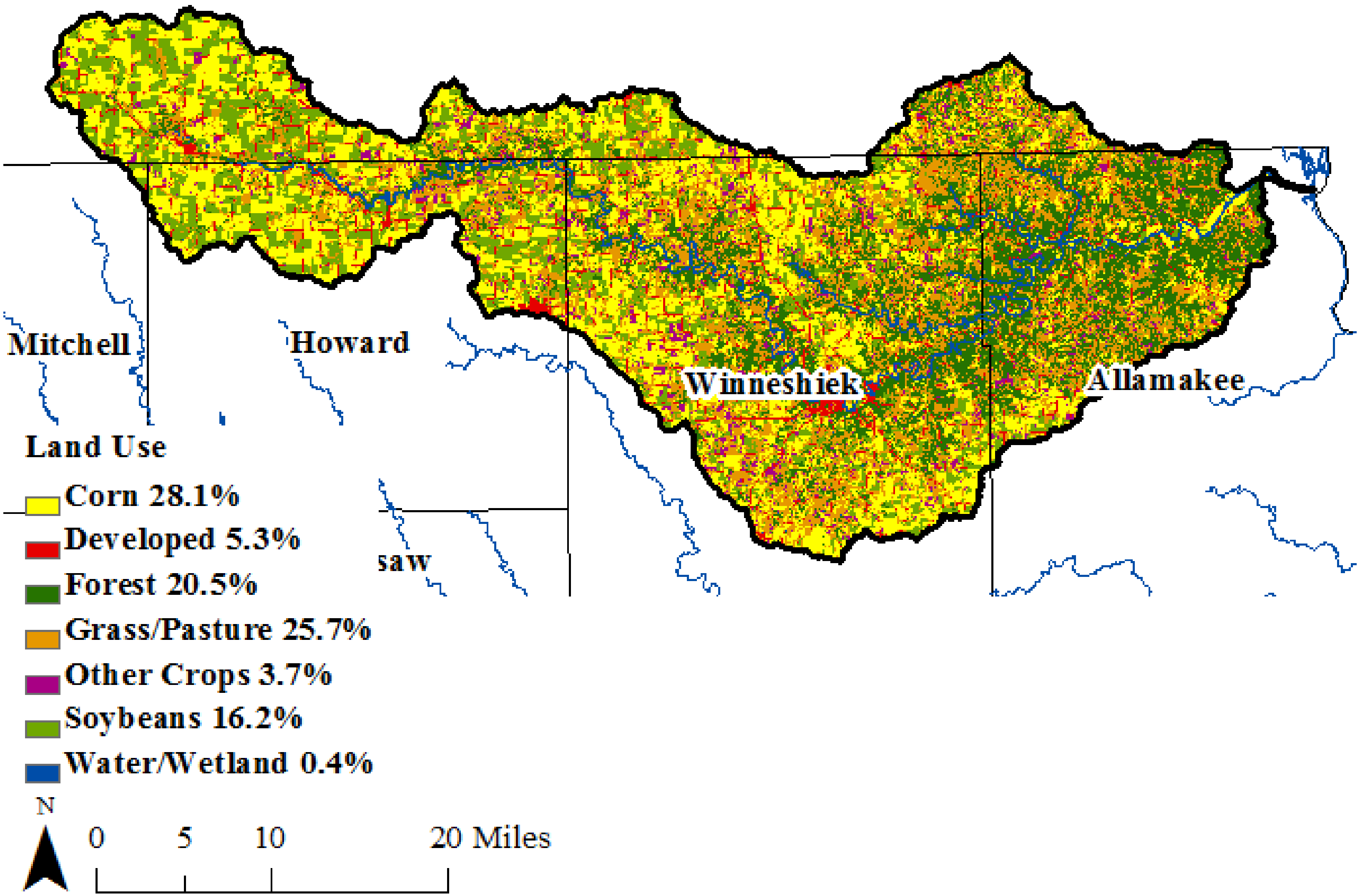

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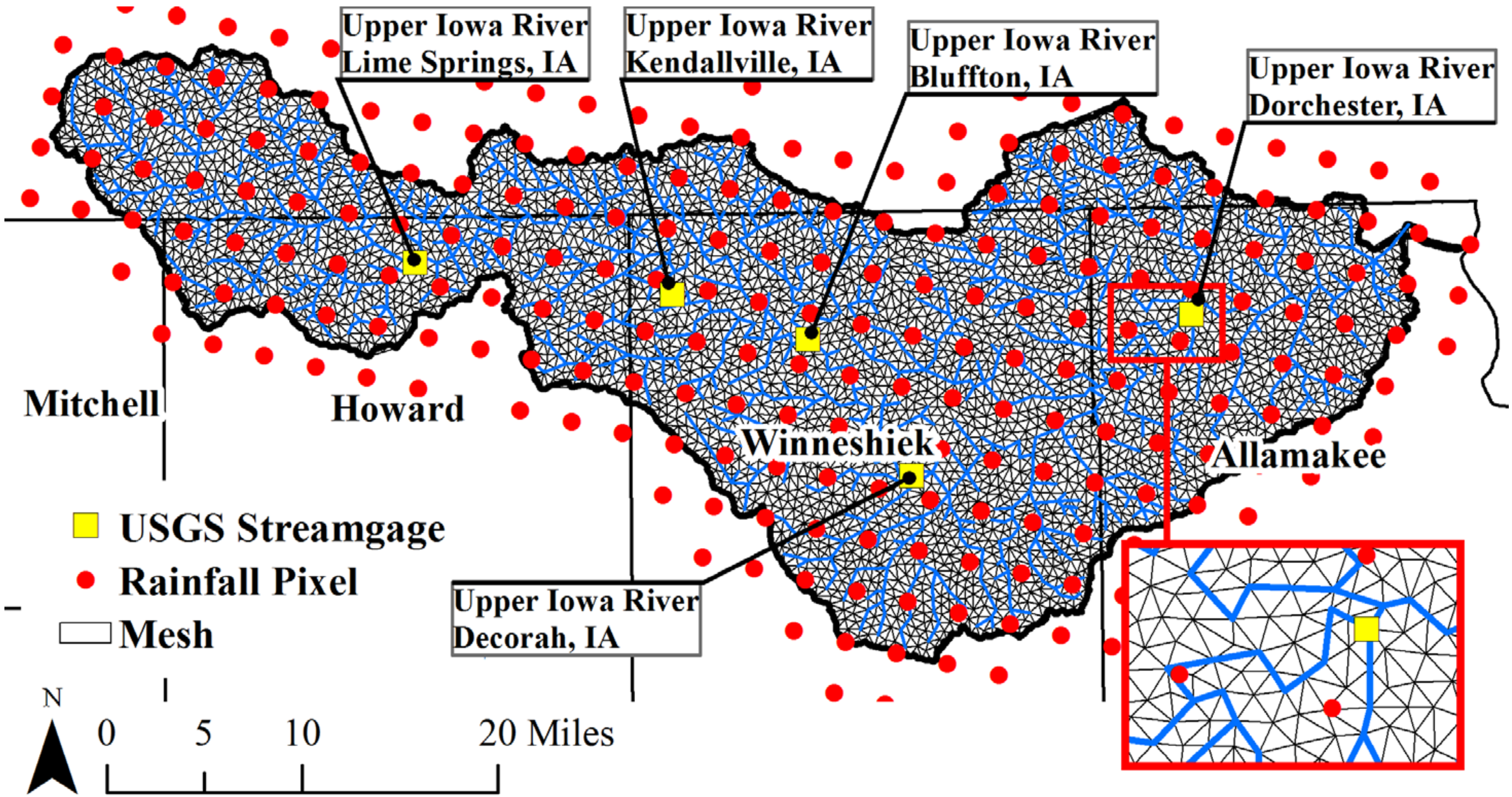

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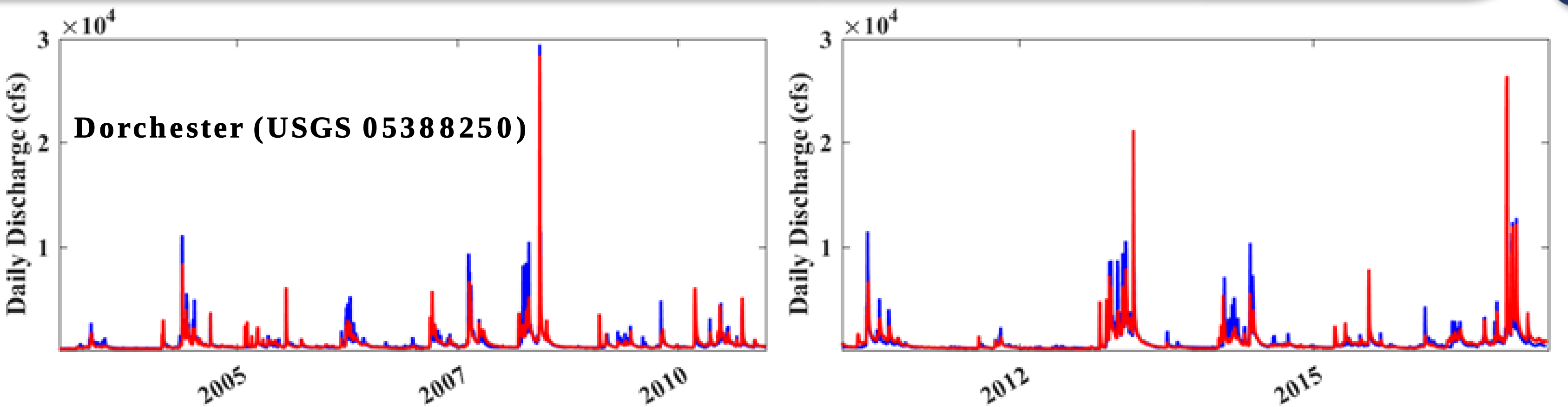

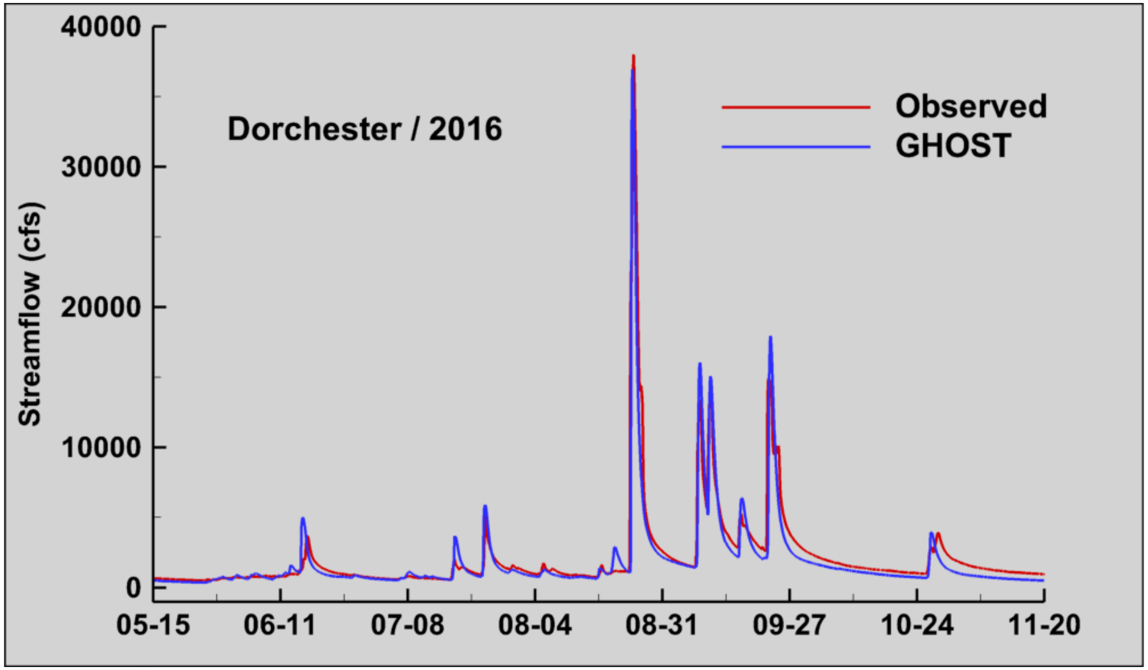

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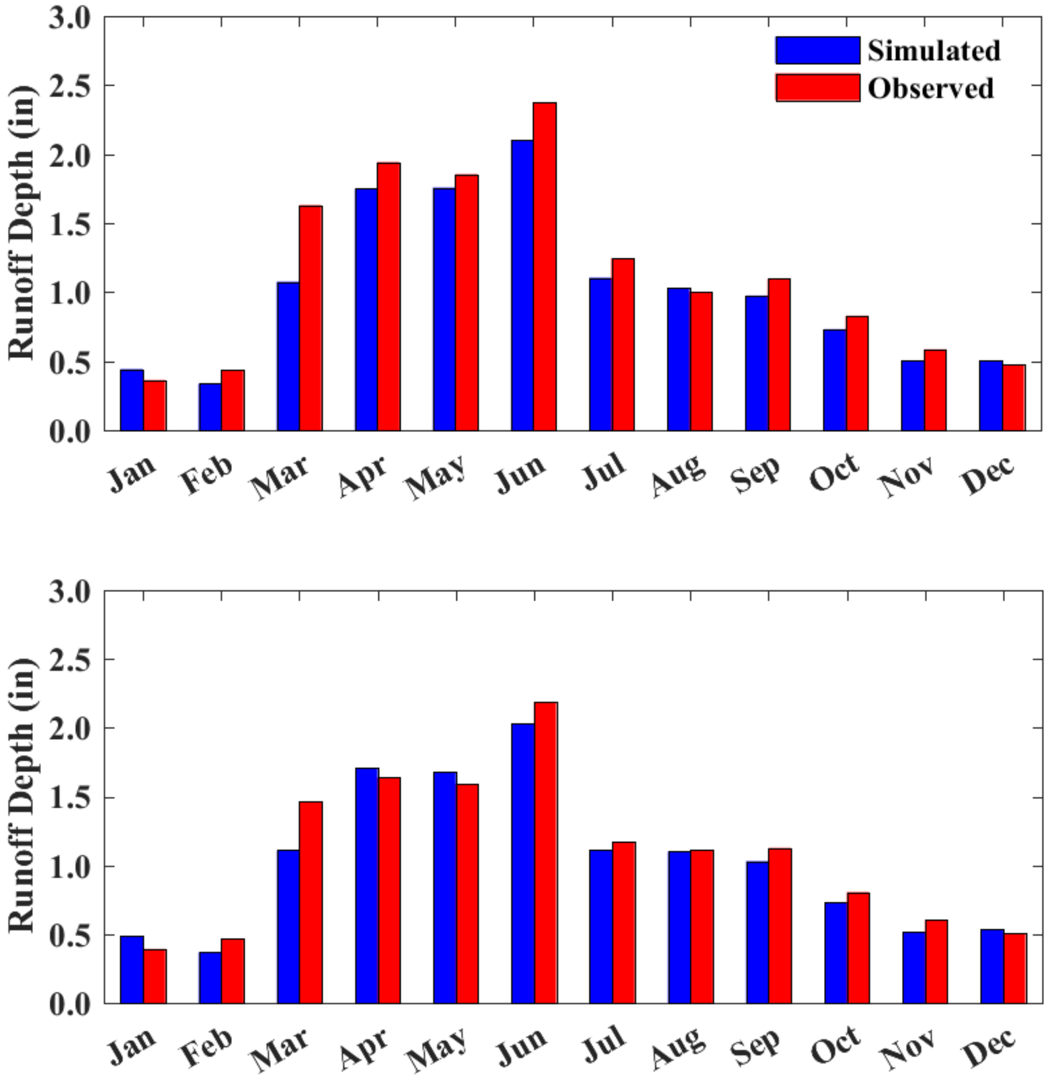

Observed and simulated average monthly runoff depth (in inches) for the Upper Iowa River Watershed. Results are shown for both the calibration and validation periods. Top: Decorah (USGS 05387500) and bottom: Dorchester (USGS 05388250).

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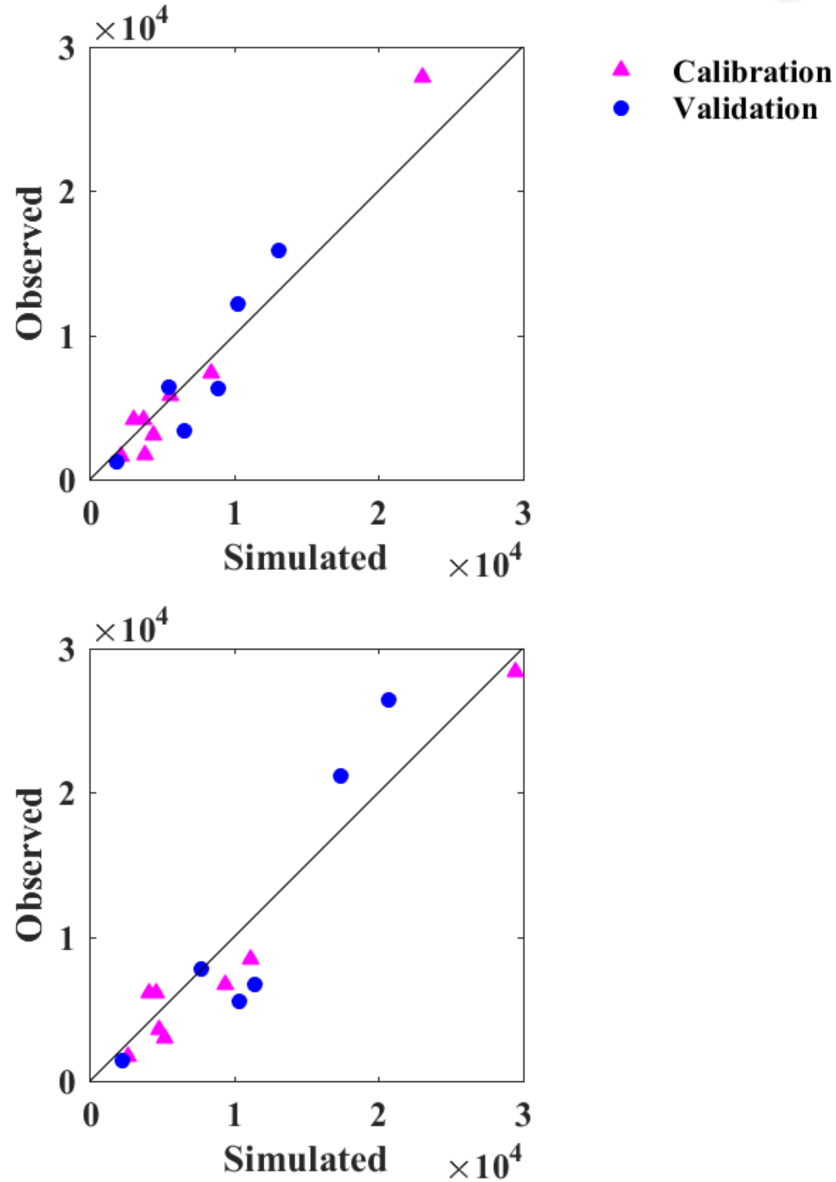
Simulated versus observed annual maximum peak daily discharges (cfs). Top: Decorah (USGS 05387500) and bottom: Dorchester (USGS 05388250).



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Analysis of Watershed Scenarios

- **Increased rainfall intensity**
- **Analysis of Flood Mitigation Strategies**
  - **Native Prairie**
  - **Mitigating the Effects of High Runoff with Increased Infiltration/Cover Crops/No-Till**
  - **Mitigating the Effects of High Runoff with Distributed Storage**

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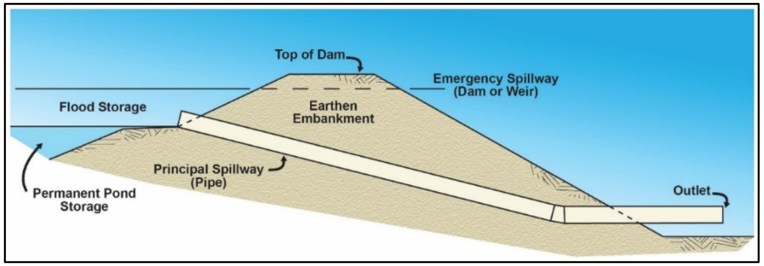
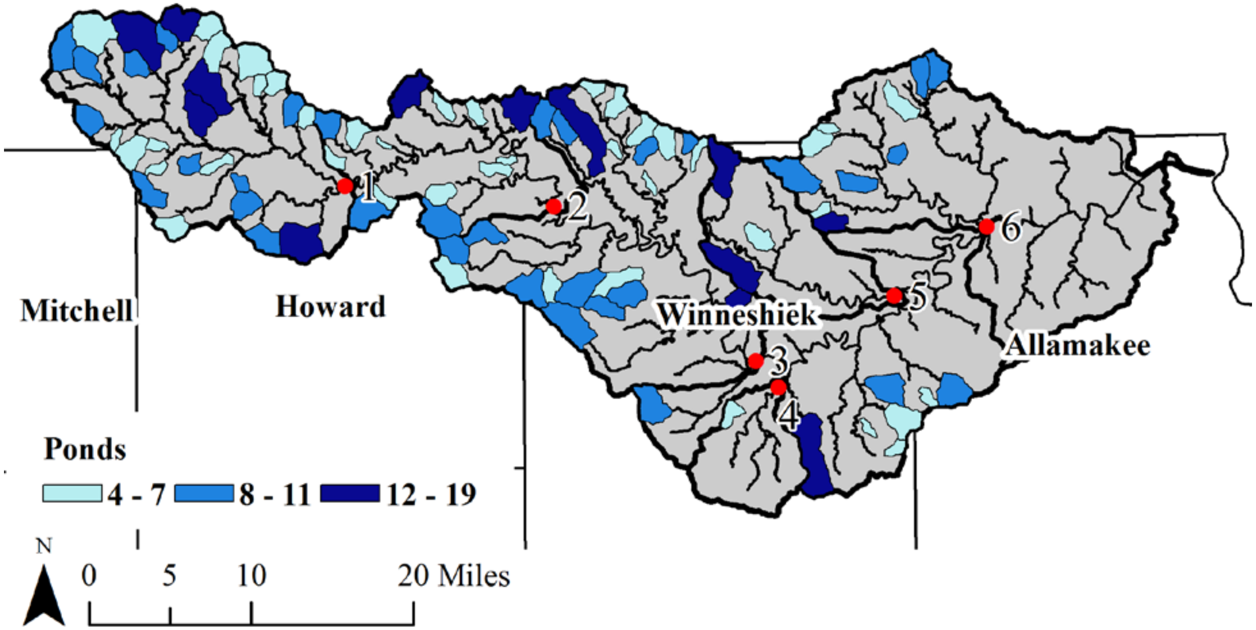
Pond Locations and Index Points

Index Point	Represents
1	Upper Iowa River at Lime Springs
2	Upper Iowa River at Kendallville
3	Upper Iowa River into Decorah
4	Near outlet of Trout Creek (HUC 12 near Decorah/Freeport)
5	Canoe Creek (HUC10)
6	Upper Iowa River at Dorchester





Ponds (735) placement in the Upper Iowa River Watershed.

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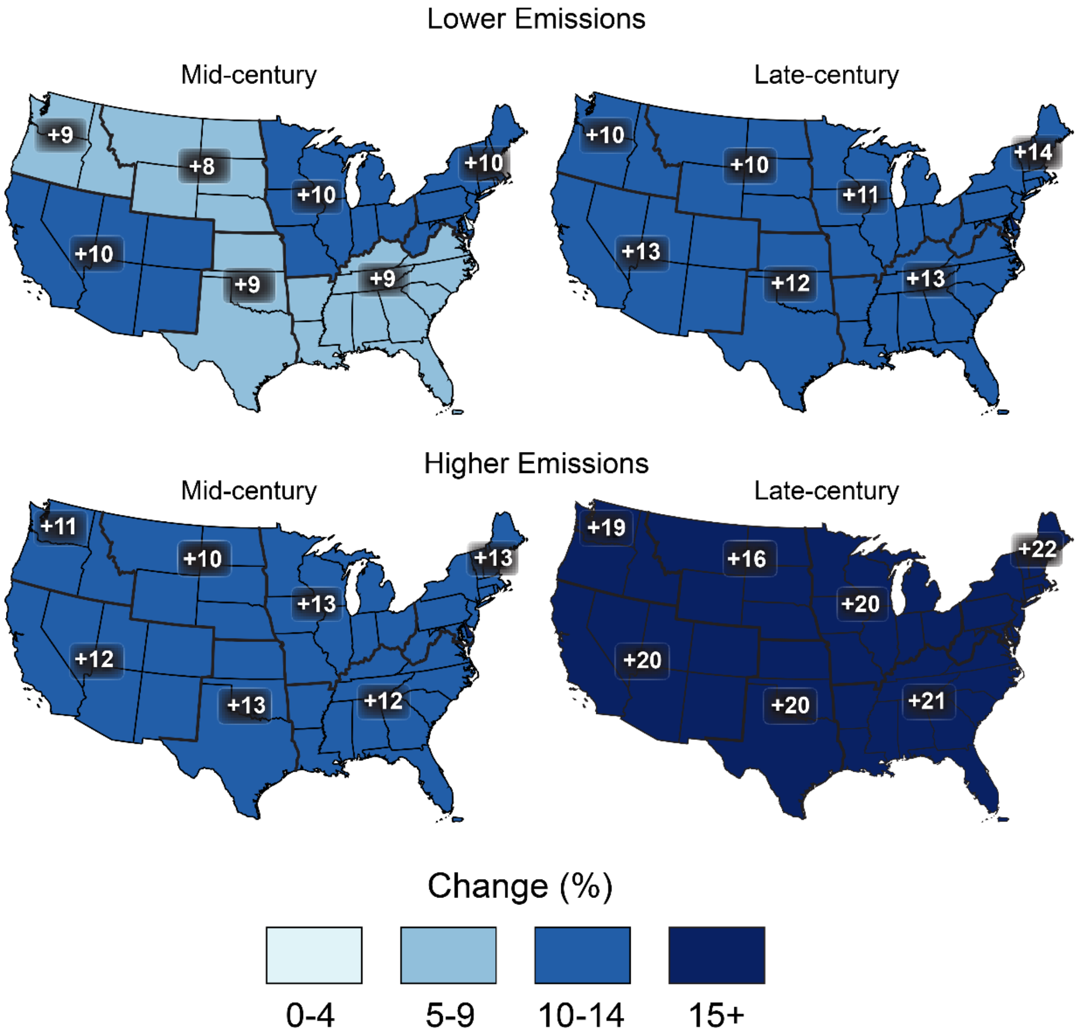
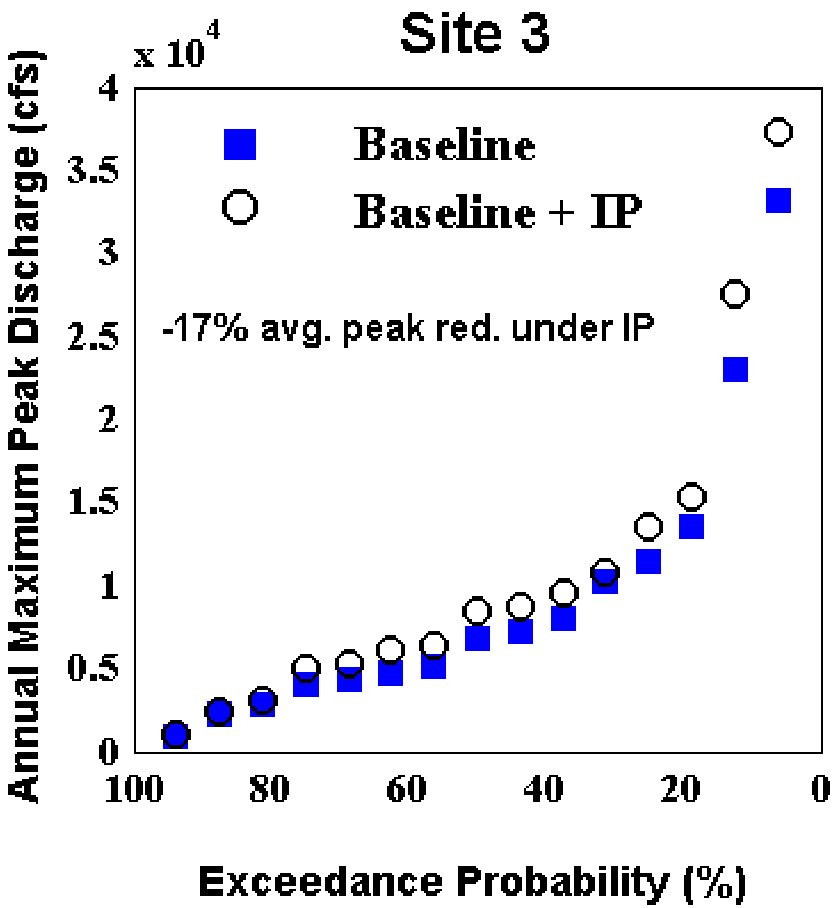
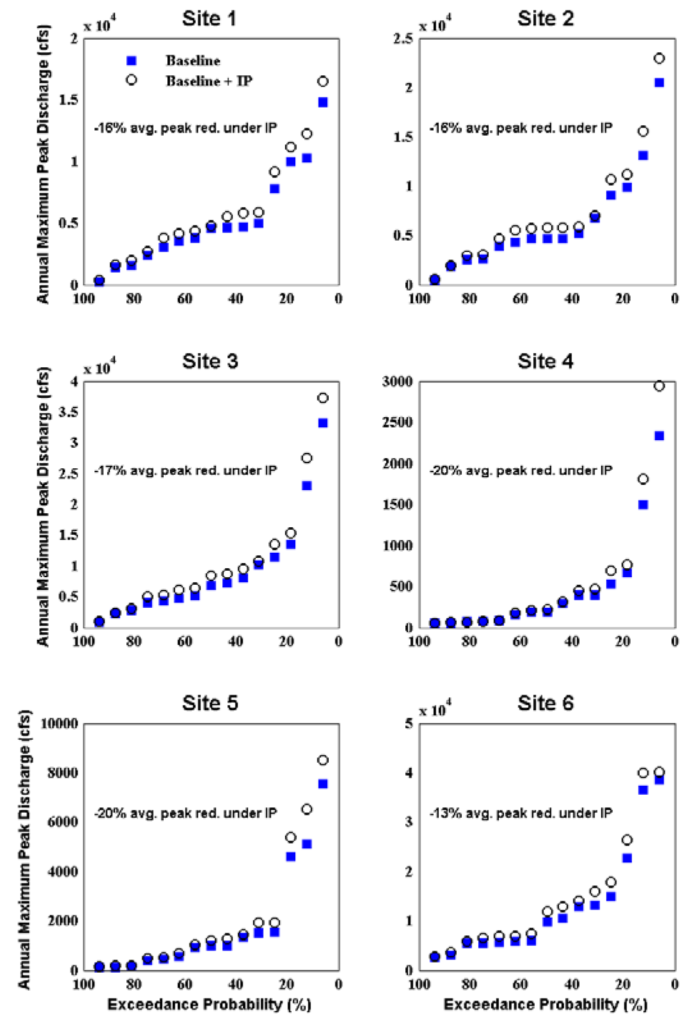


Projected change in heavy precipitation. Twenty-year return period amount for daily precipitation for mid- (left maps) and late-21st century (right maps). Results are shown for a lower emissions scenario (top maps; RCP4.5) and for a higher emissions scenario (bottom maps, RCP8.5). Figure taken from The Climate Science Special Report (Easterling et al. 2017) (https://science2017.globalchange.gov/).

Scenario Results/Historic Precipitation/Increased Precipitation





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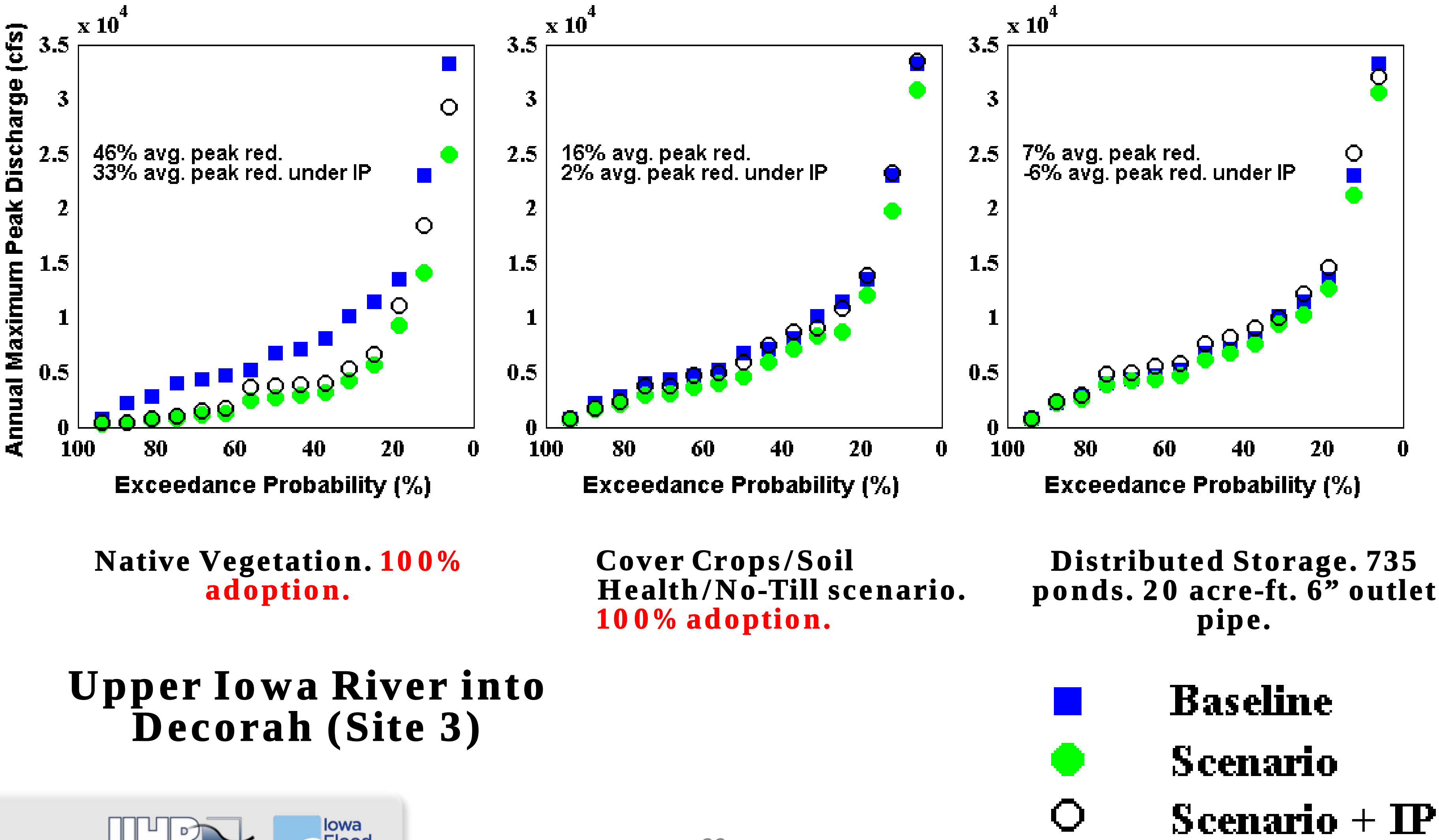
Scenario Results/Historic Precipitation/Increased Precipitation (IP)



Native Vegetation. 100% adoption.

Cover Crops/Soil Health/No-Till scenario. 100% adoption.

Distributed Storage. 735 ponds. 20 acre-ft. 6" outlet pipe.

Upper Iowa River into Decorah (Site 3)

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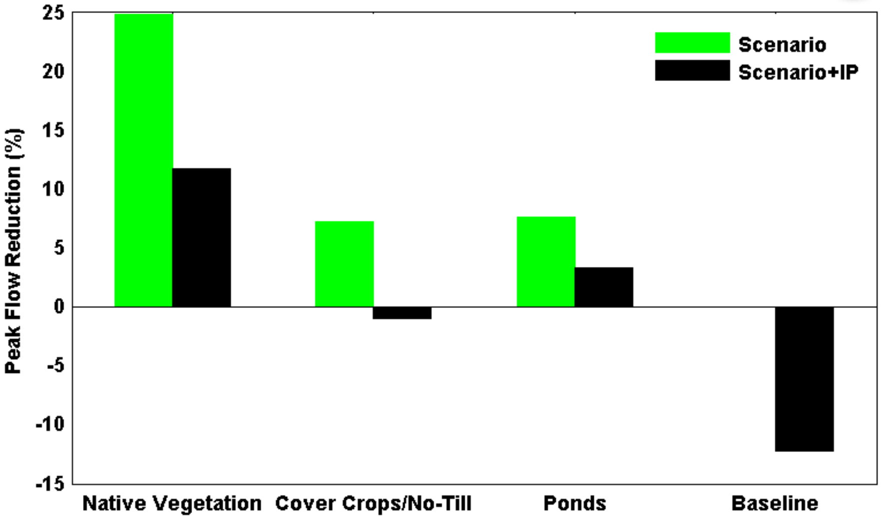
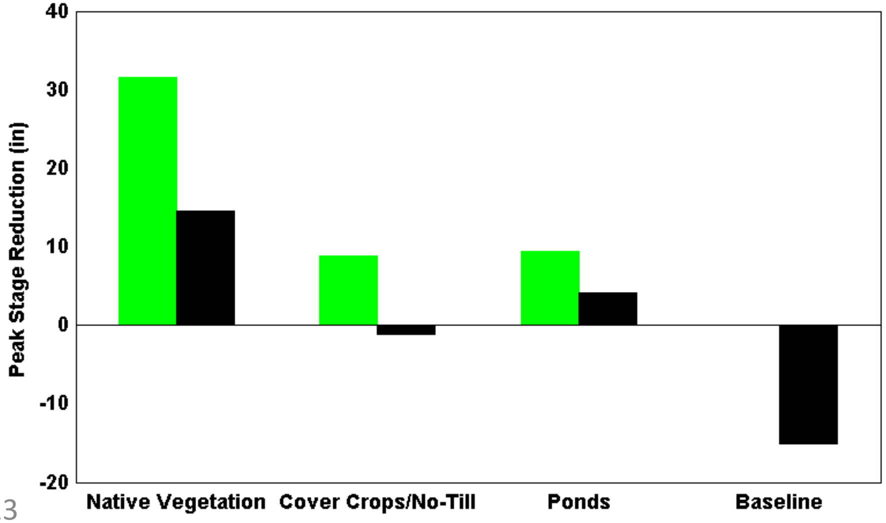
Model results at *Decorah in 2008*. Top: annual peak flow reductions. Bottom: Peak flow stage reduction (inches).

- **Native Vegetation. 100% adoption.**
- **Cover Crops/Soil Health/No-Till scenario. 100% adoption.**
- **Distributed Storage. 735 ponds. 20 acre-ft. 6” outlet pipe.**





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The University of Iowa
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Iowa City, IA 52242

319-384-1729
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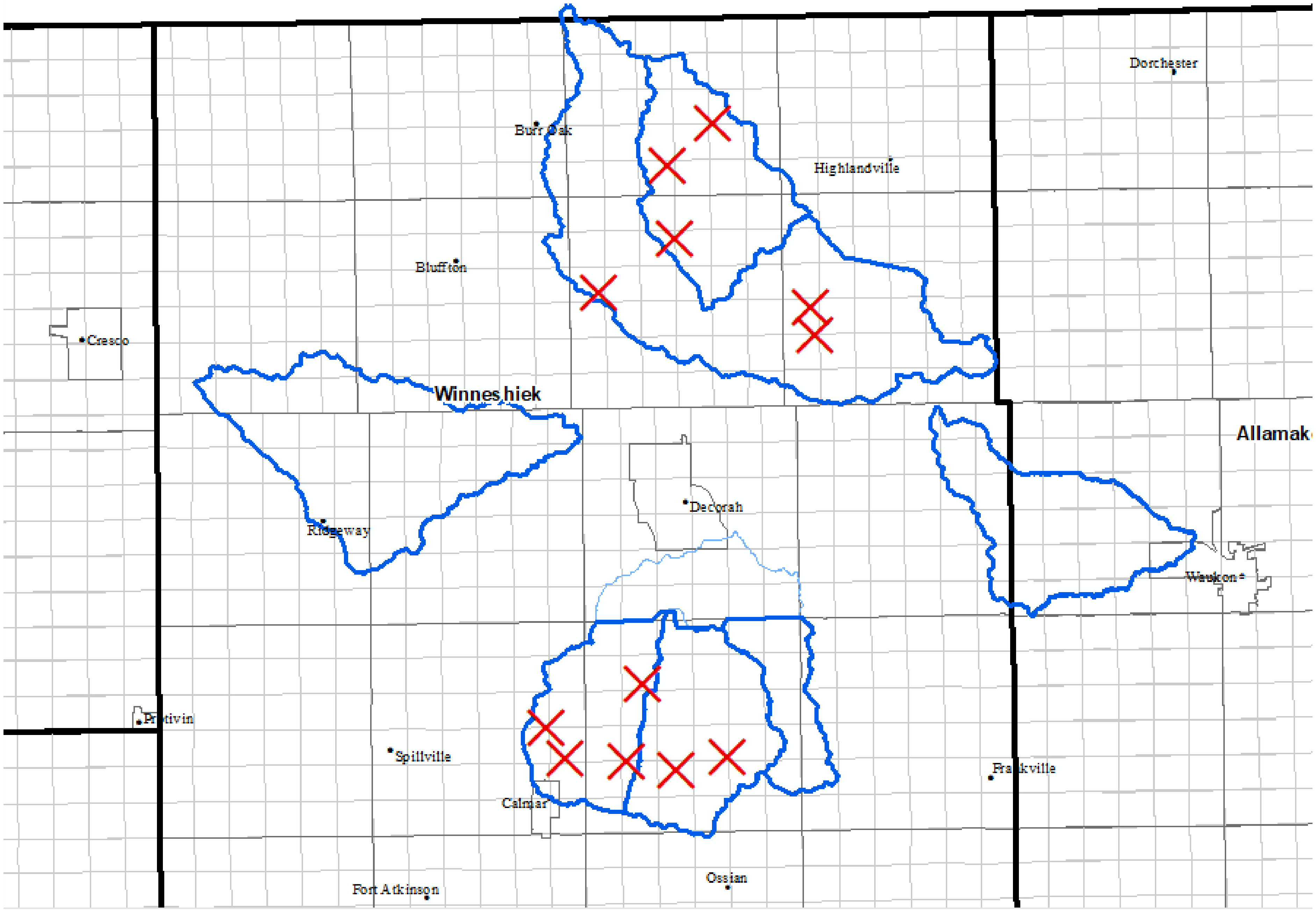
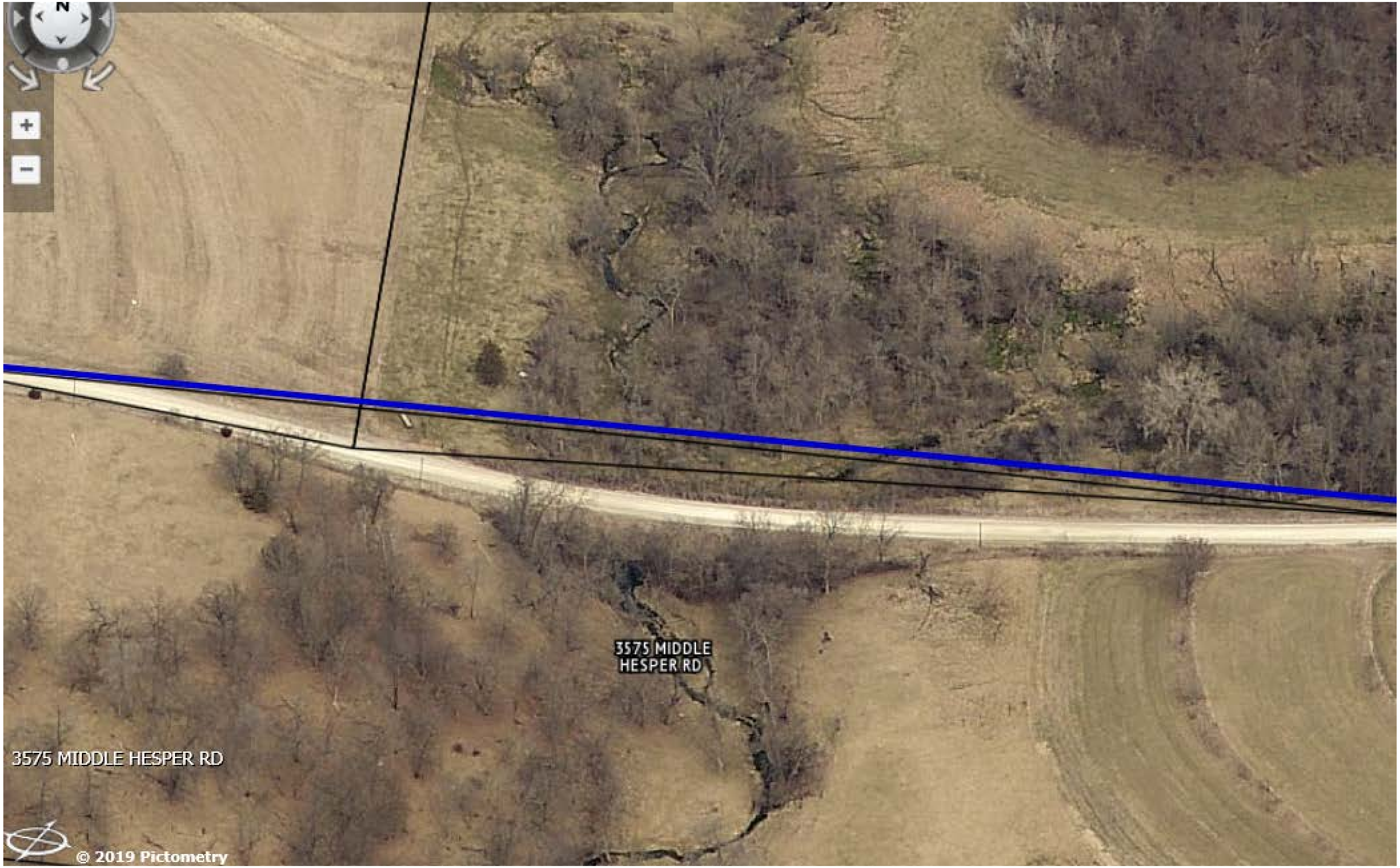
The University of Iowa College of Engineering
IIHR Hydroscience & Engineering
Iowa Flood Center

UIR WMA 2019 Project Sites

Matt Frana – *UIR Project Coordinator*

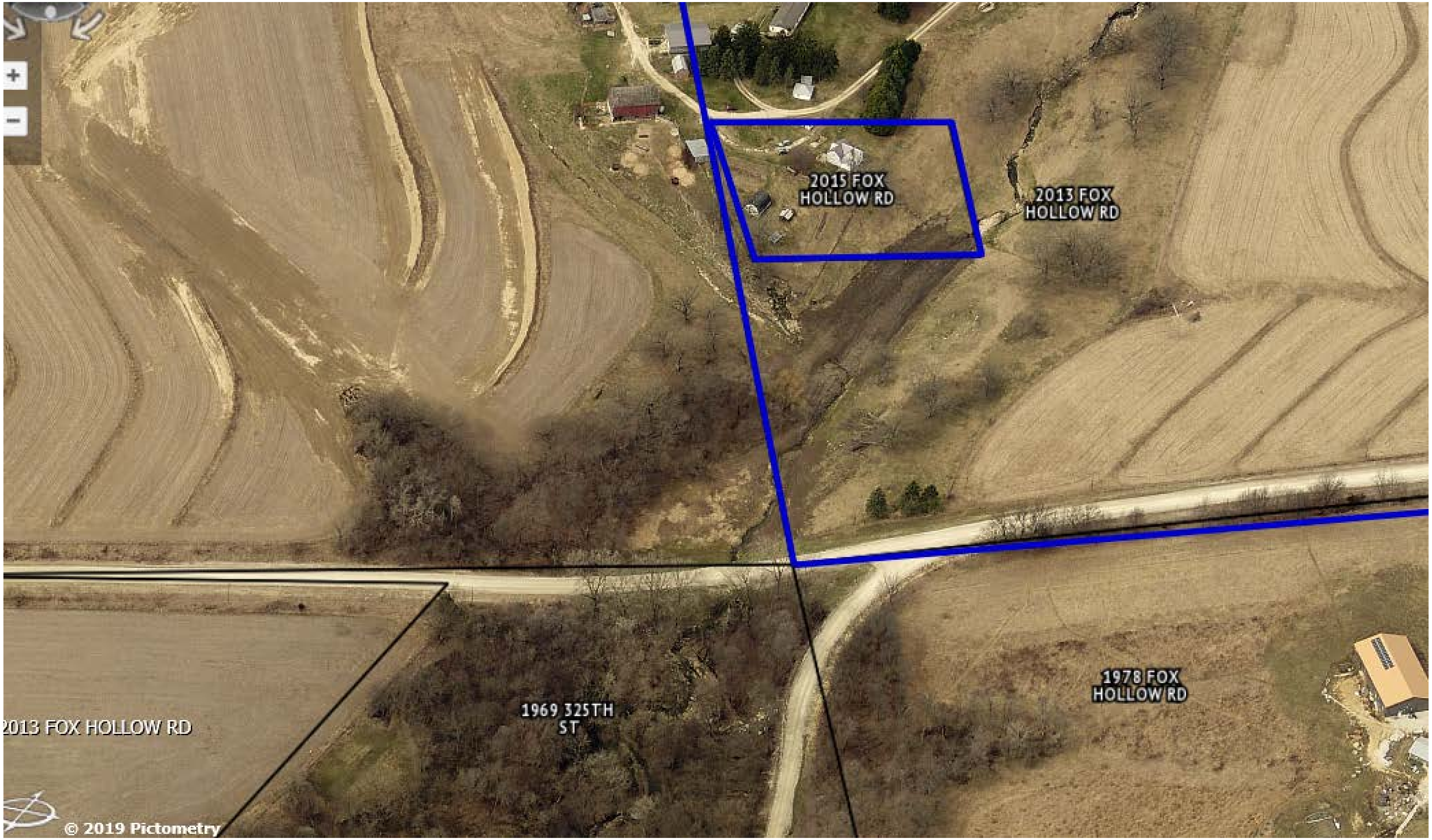

Dorchester
Burr Oak
Highlandville
Bluffton
Cresco
Winneshiek
Allamakee
Decorah
Ridgeway
Waukon
Protivin
Spillville
Frankville
Calmar
Ossian
Fort Atkinson


Winneshiek
Road Structure
Drainage Area - 350ac
Estimated Cost - $250,000
Start Date - Fall 2019


N
3575 MIDDLE HESPER RD
3575 MIDDLE HESPER RD
© 2019 Pictometry


Winneshiek
1 WASCOB, 2 waterways
Drainage Area - 15ac
Estimated Cost - $25,000
Start Date - Summer 2019


Winneshiek
Road Structure
Drainage Area - 370ac
Estimated Cost - $330,000
Start Date - Fall 2019


2015 FOX HOLLOW RD
2013 FOX HOLLOW RD
1978 FOX HOLLOW RD
1969 325TH ST
2013 FOX HOLLOW RD
© 2019 Pictometry

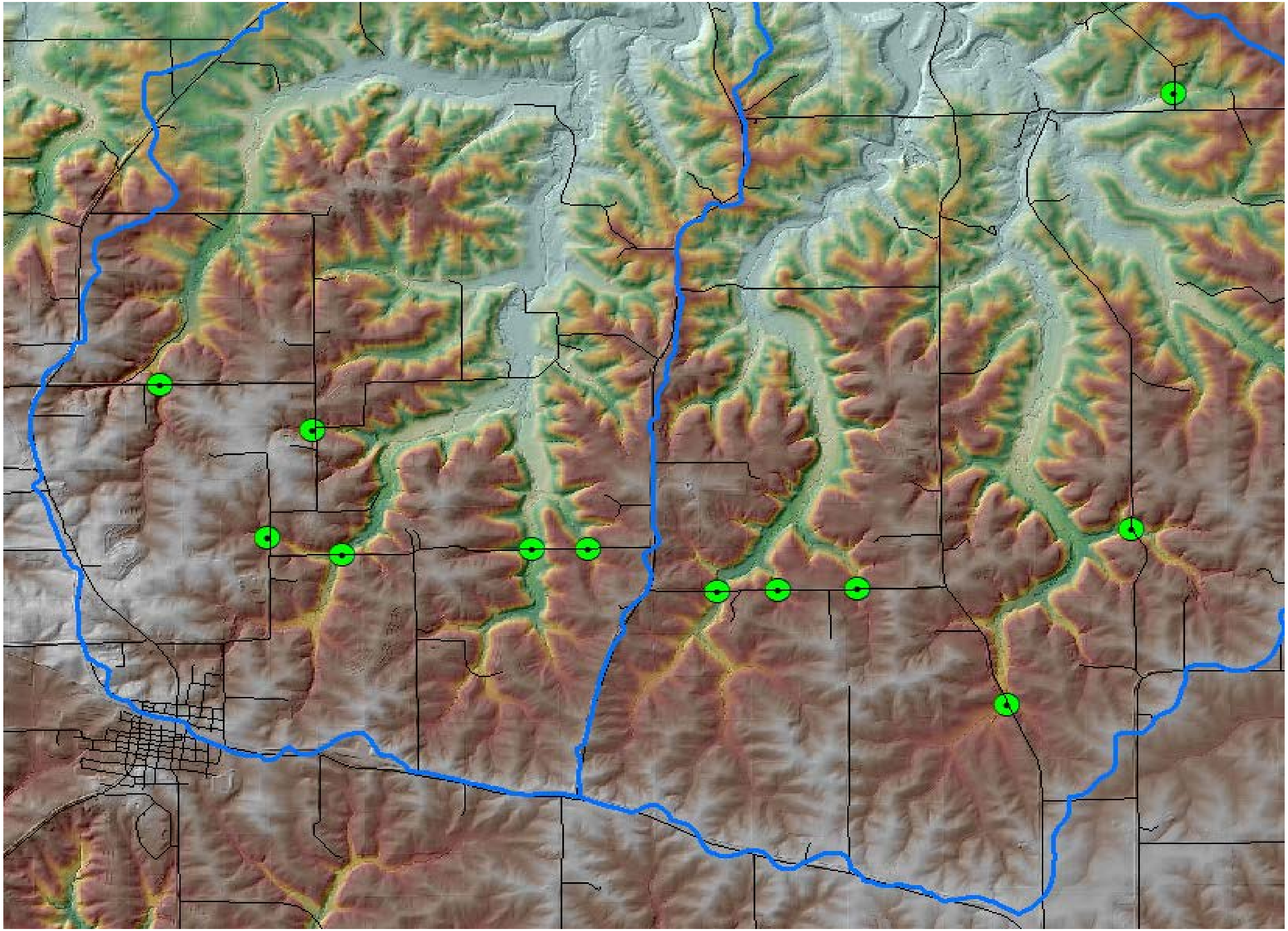

Pond
Drainage Area - 35ac
Estimated Cost - $35,000
Start Date - Fall 2019
Winneshiek

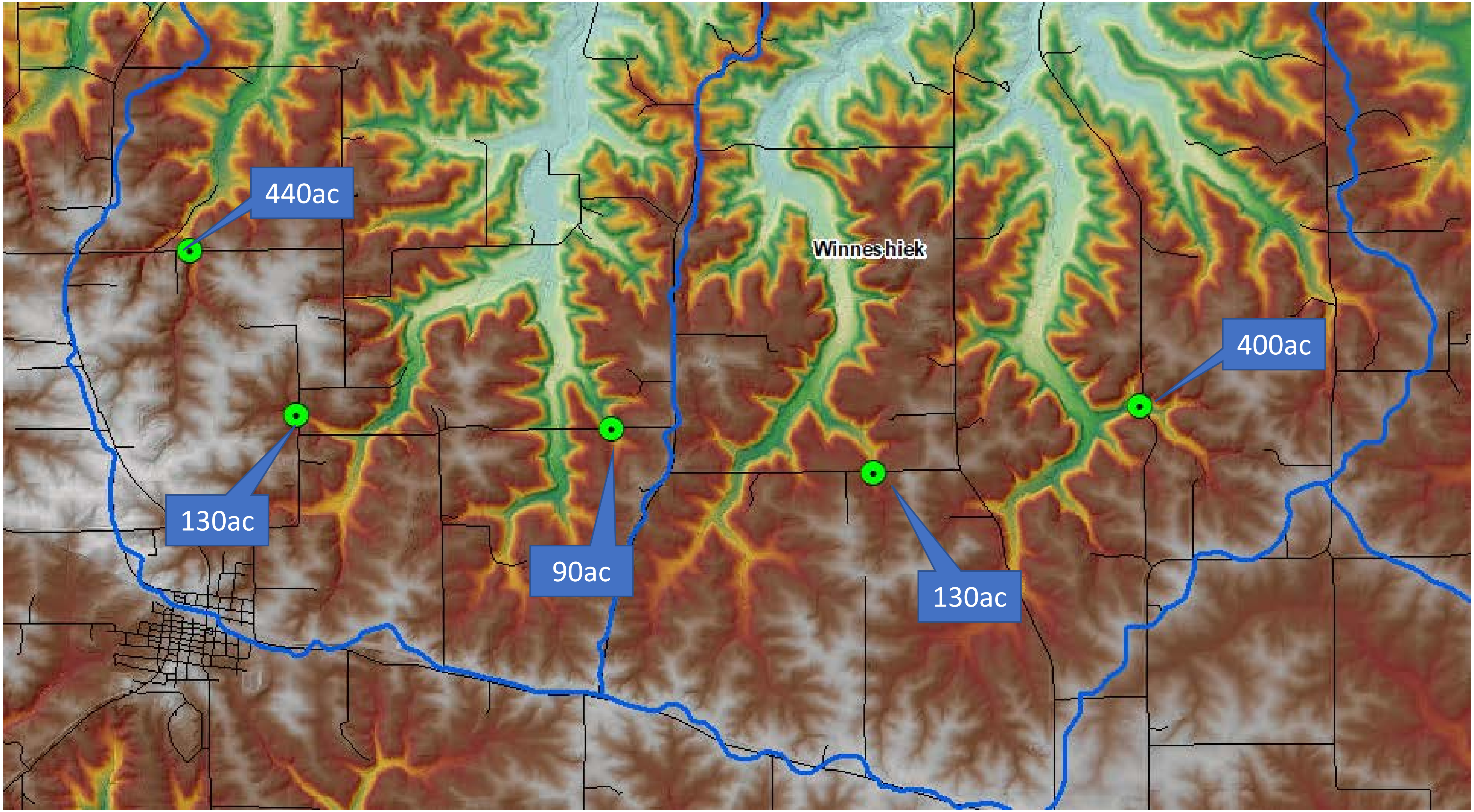

Pond
Drainage Area - 250ac
Estimated Cost - $125,000
Start Date - Summer 2019


MIDDLE


Winneshiek
Pond
Drainage Area - 80ac
Estimated Cost - $50,000
Start Date - Summer 2019


Pond
Drainage Area - 40ac
Estimated Cost - $25,000
Start Date - Summer 2019
Winneshiek

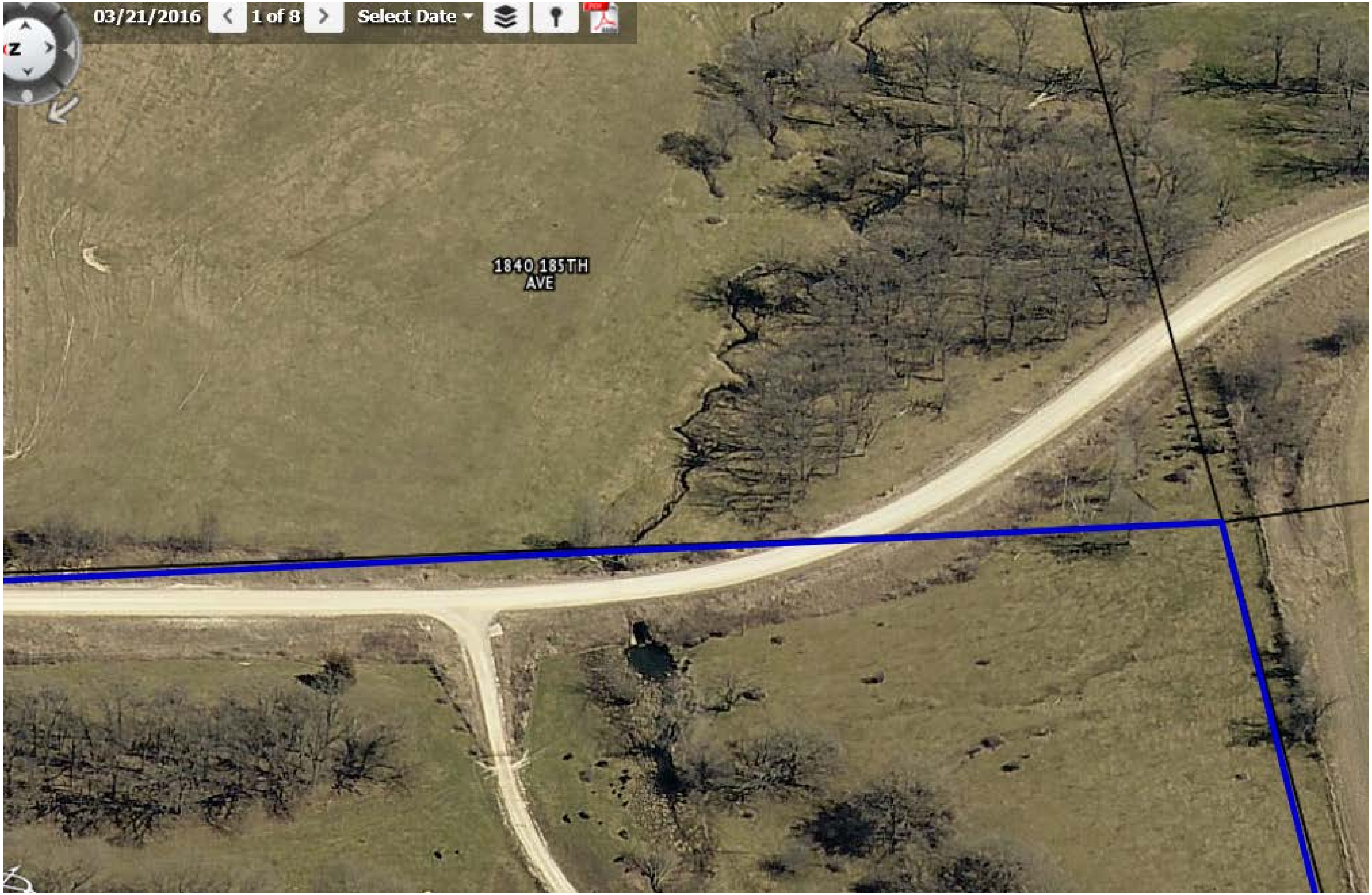


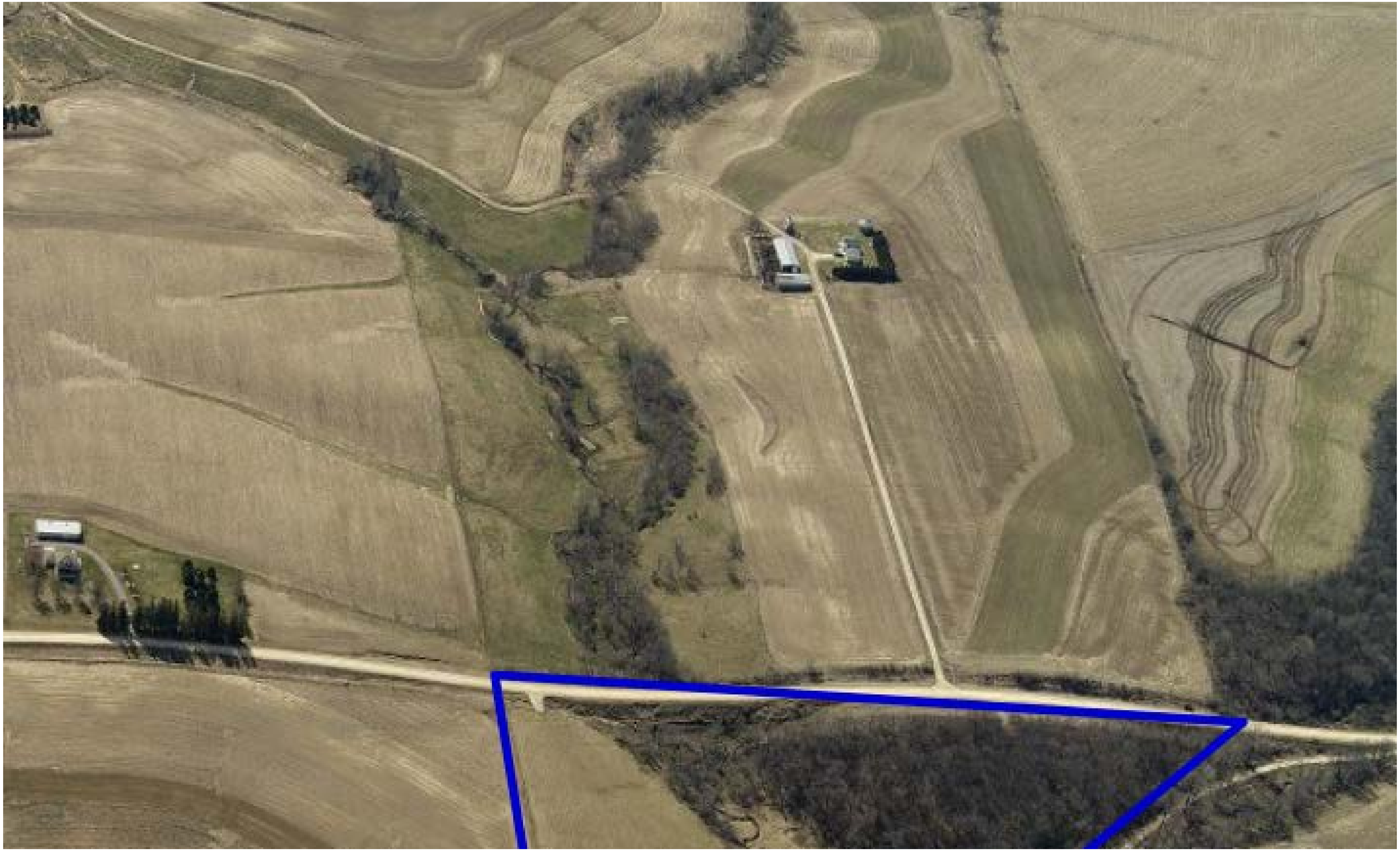


~1200ac total


Road Structure
Drainage Area - 90ac
Estimated Cost - $370,000
Start Date - Fall 2019
Winneshiek


1823 MIDDLE
CALMAR RD


03/21/2016
1 of 8
Select Date
1840 185TH AVE



2019 Projects in the Works

- 8 projects with designs and estimates
- Total Acres Treated = 1235 acres
- Total Estimated Project Cost - $1,210,000
- Around $1,000/ac to treat