

The Iowa Watershed Approach

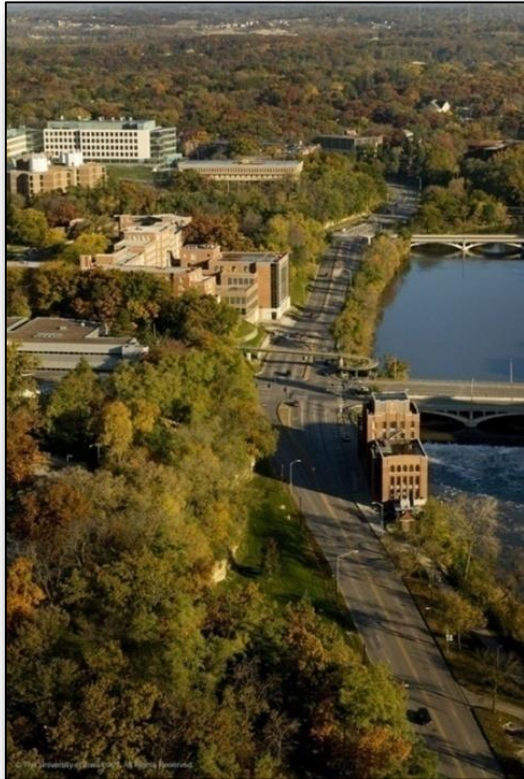


Larry J Weber

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Director, IIHR—Hydroscience & Engineering

IIHR—Hydrosience & Engineering



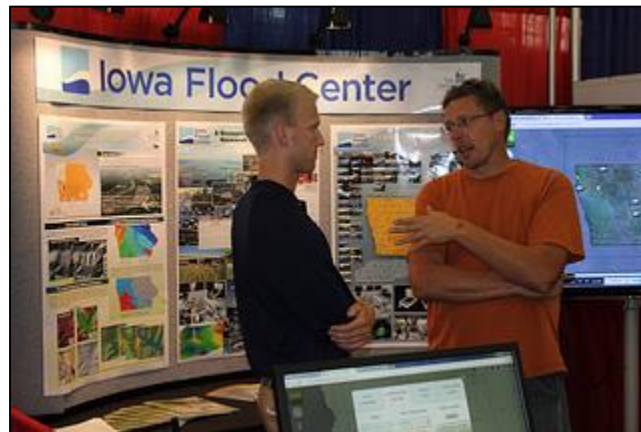
IIHR is a unit of the University of Iowa's College of Engineering. At IIHR, students, faculty members, and research engineers work together to understand and manage one of the world's greatest resources—water.



www.iihr.uiowa.edu

Iowa Flood Center

In response to extreme flooding in 2008, the state legislature established the Iowa Flood Center at the University of Iowa to serve as a technical resource for Iowans.



www.iowafloodcenter.org

National Disaster Resilience Competition



- Funder: US Dept. of Housing and Urban Development (HUD), in collaboration with the Rockefeller Foundation
- Funding Level: \$1 billion; Community Development Block Grant; Superstorm Sandy (special appropriation of \$180M)
- Applicant: State of Iowa, Iowa Economic Development Authority
- *Iowa Watershed Approach* program development by Iowa Flood Center in consultation with many, many partners

HUD's Program Goals

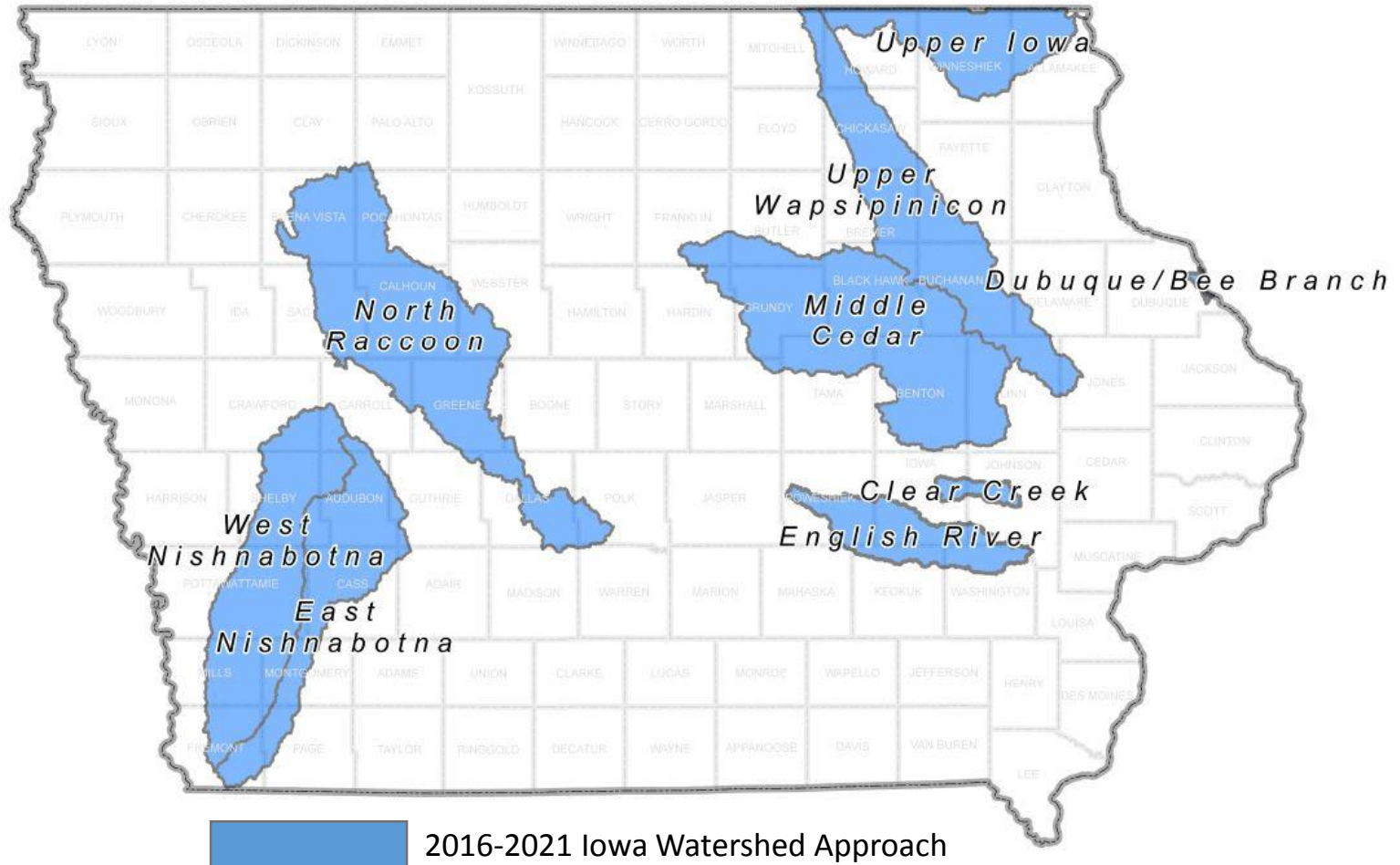


- Help communities recover from prior disasters and improve their ability to withstand and recover more quickly from future disasters, hazards, and shocks
- Consider future risks and vulnerabilities in planning and decision-making
- Help communities better understand their risks and identify ways in which they can protect the long-term well-being and safety of residents

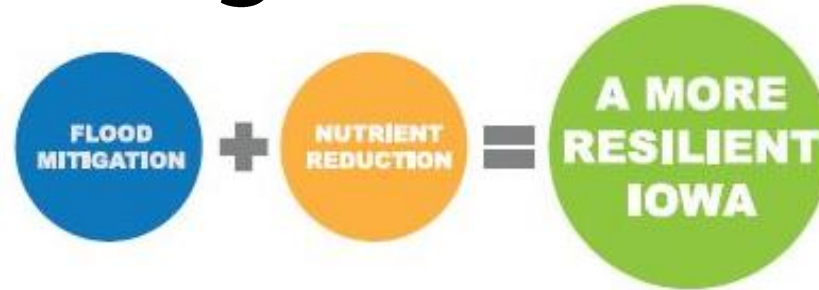
Iowa Watershed Approach Partners



Iowa Grant Award: \$96,887,177



Iowa Watershed Approach (IWA): Program Goals



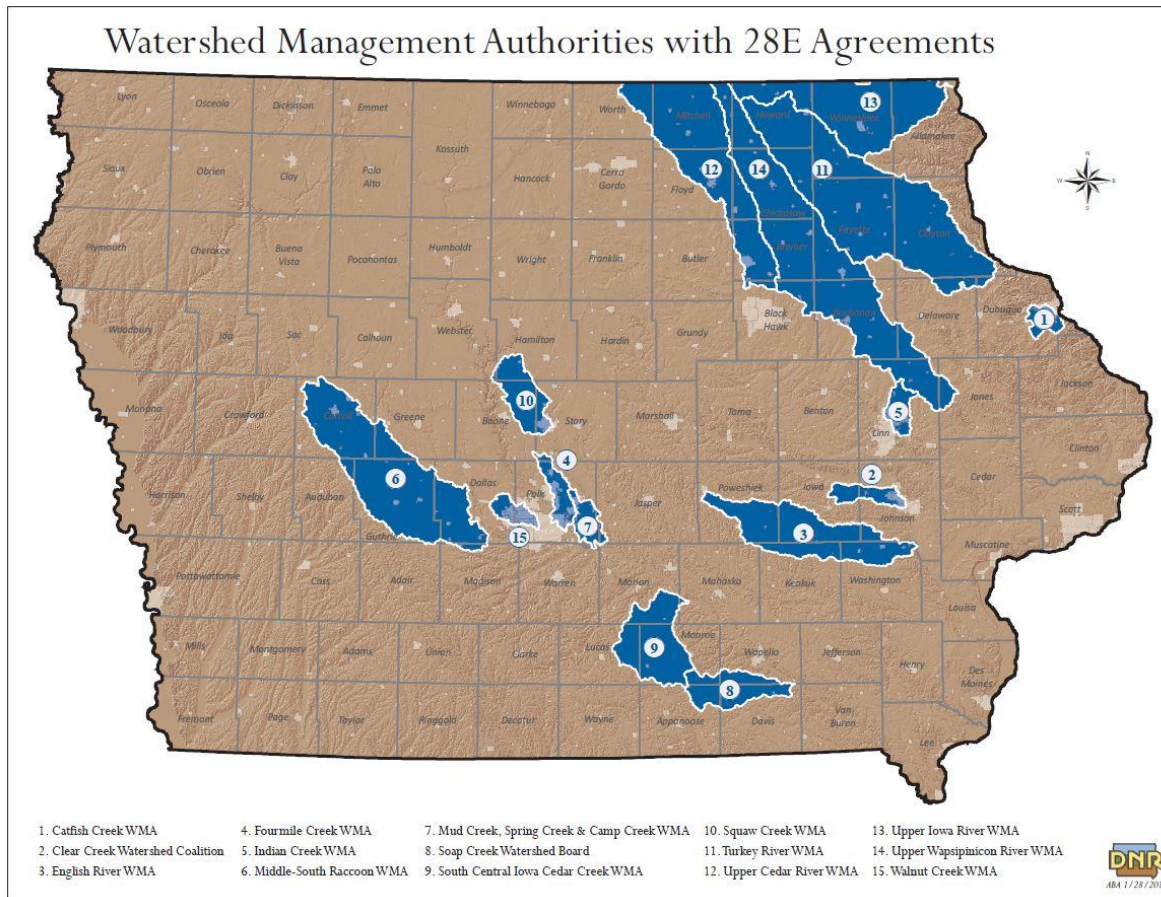
- Reduce flood risk
- Improve water quality
- Increase resilience
- Engage stakeholders through collaboration and outreach/education
- Improve quality of life and health, especially for vulnerable populations
- Develop a program that is replicable throughout the Midwest and the United States

IWA Project Description



- Establish a Watershed Management Authority
- Develop a hydrologic assessment and watershed plan
- Deploy monitoring equipment
- Implement projects in the watershed to reduce the magnitude of downstream flooding and improve water quality
- Assess the project benefits based on monitoring and modeling data

Watershed Management Authority

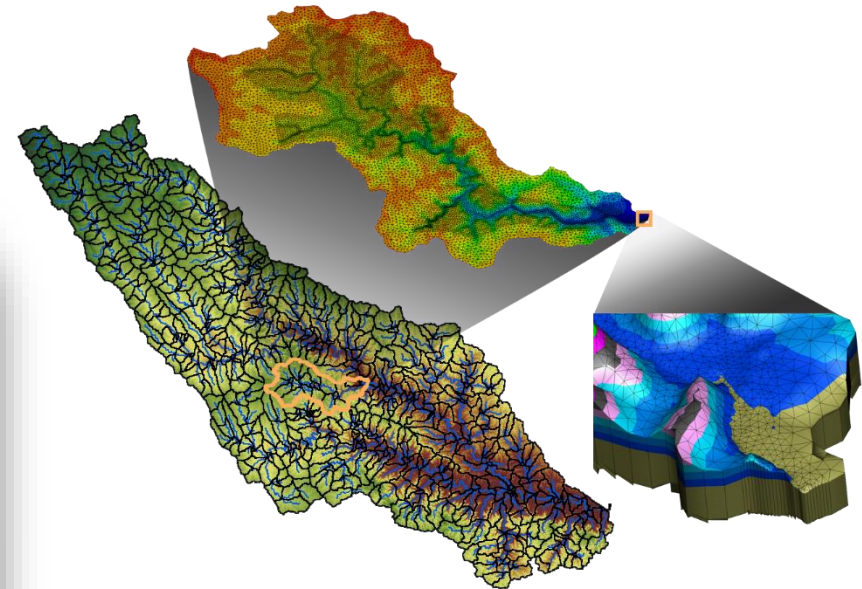
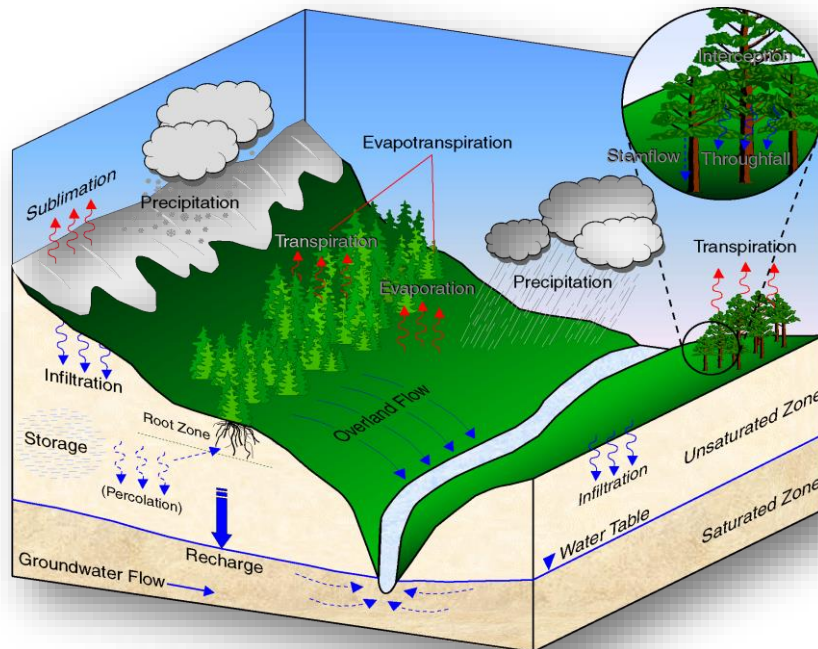


Benefits of forming a WMA:

- Foster multi-jurisdictional partnership and cooperation
- Develop a watershed plan
- Leveraging resources such as funding, technical expertise
- Facilitate stakeholder involvement in watershed management

Hydrologic Assessment & Modeling

- Understand flood hydrology in the watershed
- Estimate watershed response to different rainfall events
- Quantify the impact of small-scale flood mitigation practices



Project Construction & Implementation



- Engage volunteer landowners to construct projects in subwatersheds
- Practices may include:

Floodplain restoration or easements, farm ponds, terraces, buffer strips, bioreactors, wetlands, saturated buffers, storm water detention basins, sediment detention basins

- 75% cost share assistance available to landowners; 25% local (landowner) contribution
- Practices will follow NRCS guidelines and specifications
- Monitor impact of constructed projects and evaluate feasibility at a larger scale

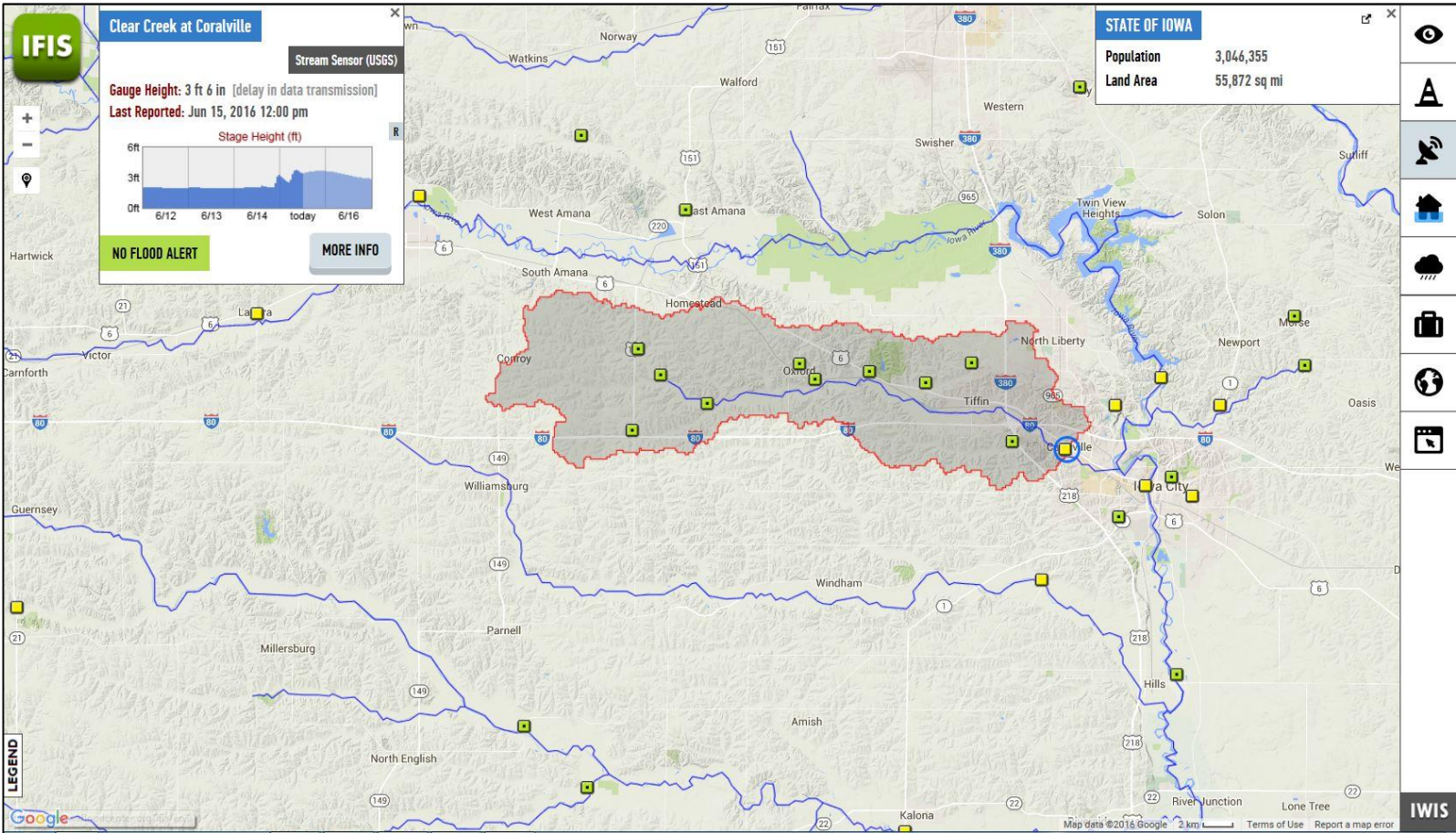
Engagement of WMA, watershed partners, and private landowners will be vital to project success

Data Collection & Monitoring





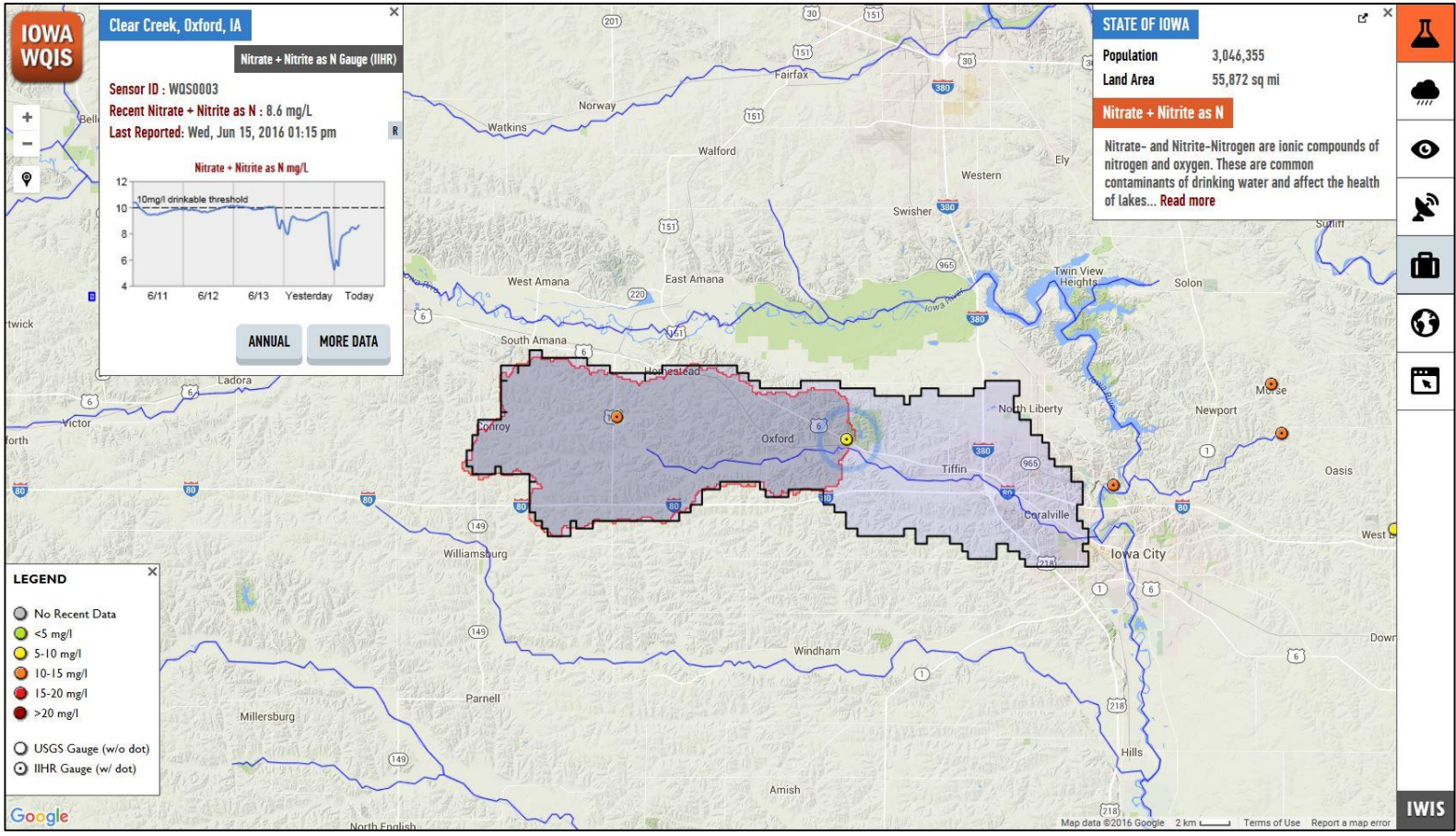
Iowa Flood Information System



<http://ifis.iowafloodcenter.org/ifis/en/>



Iowa Water-Quality Information System



<http://iwqis.iowawis.org/app/>

Resilience Program

- *Ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events*
- “Build back stronger”
- “Build back differently”



What Does a Resilient Community Look Like?
A RESILIENT COMMUNITY...

- Engages governments, nonprofit and faith-based organizations, businesses, and citizens to identify and manage risks together
- Communicates risks clearly
- **Measures resilience and tracks progress**
- Exchanges lessons learned with other communities

<http://resilientamerica.nas.edu>

IWA Flood Resilience Team

The IWA Flood Resilience Team will engage stakeholders in nine watersheds for 3 to 5 years

YEAR 1

Clear Creek
 Upper Iowa
 English River

YEAR 2

Clear Creek
 Upper Iowa
 English River

Middle Cedar
 Upper Wapsi
 Dubuque

YEAR 3

Clear Creek
 Upper Iowa
 English River

Middle Cedar
 Upper Wapsi
 Dubuque

North Raccoon
 East Nish
 West Nish

YEAR 4

Ongoing
 Assessment

Middle Cedar
 Upper Wapsi
 Dubuque

North Raccoon
 East Nish
 West Nish

YEAR 5

Ongoing
 Assessment

Ongoing
 Assessment

North Raccoon
 East Nish
 West Nish



Major IWA Flood Resilience Team Activities



Local Hazard Mitigation & Disaster Recovery Planning

| Flood Risk Analysis | Disaster Recovery |
|--|---|
| <p>Hazard Identification Review Historical Impacts, Conduct an Asset Inventory</p> | <p>Recovery Organization Framework Community Priorities</p> |
| <p>Vulnerability Assessment Determine the Likelihood Determine the Economic Social, Legal, and environmental consequences</p> | <p>Recovery Support Functions Community Planning Economic Health & Social Services Housing Infrastructure Systems Natural & Cultural Resources</p> |
| <p>Impacts Assessment Hazus Modeling Integrated Climate Conditions Identify community weaknesses</p> | <p>Disaster Case Management Unmet Recovery Needs Vulnerable Populations Voluntary Organizations</p> |
| <p>Plan Development Vision, Goals, Strategies, Actions Prioritization Integration Implementations</p> | <p>Resilience?</p> |



Contact: Jessica Turba
 Planner, Iowa Homeland Security & Emergency Management
Jessica.turba@iowa.gov

Iowa Department of Ag & Land Stewardship

- Technical assistance to SWCD commissions and/or County Supervisors on management of project coordinators dedicated to HUD IWA program
- Assistance with hiring process for watershed coordinators
- Development of standard documents for use by project coordinators (i.e. maintenance agreements)
- Direct technical assistance to project coordinators related to engaging with landowners and selling practices
- Individual and/or group training for coordinators on unique requirements associated with HUD program compared to other SWCD watershed implementation grants



Contact: Jake Hansen
Bureau Chief, Water Resources Bureau
Jake.Hansen@iowaagriculture.gov

Iowa DNR

- WMA formation assistance
 - Preparing 28e documents, work with local partners to promote benefits of WMA and answer questions, GIS mapping services, project coordinator trainings
- Watershed management planning assistance
 - Assistance with developing WMP, providing technical assistance, reviewing draft documents and providing feedback
- WMA network meetings
 - Meetings will include:
 - Education/Training
 - WMA networking opportunities
 - Site visits, field trips
 - Q & A
 - Open WMA discussion
- WMA formation guidebook
 - Develop a guidebook to assist new WMAs form across the state

ISU Extension & Outreach

- Develop theme-based curriculum, outreach materials, and social media packages
- Develop a communication plan in each project watershed
- With project partners, coordinate field days, workshops, and events
- Collaborate with INRC team to develop additional outreach materials

Contact: John Lawrence
Director, Iowa Nutrient Research Center
jdlaw@iastate.edu

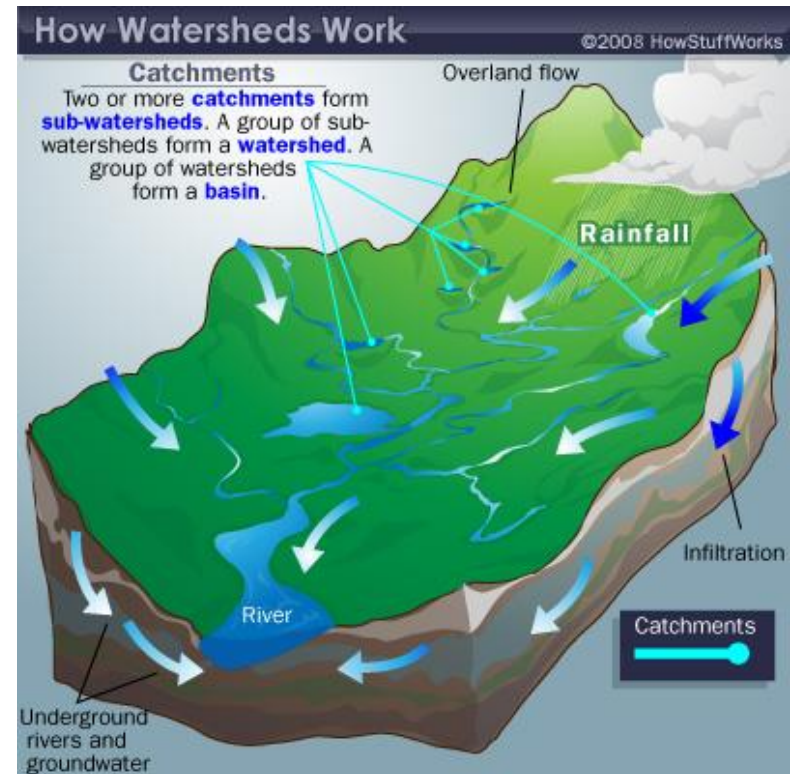
Iowa Nutrient Research Center

- Develop a framework to monetize the benefits of nutrient-reducing practices
 - Considering both primary on- and off-site economic benefits, as well as, secondary and tertiary benefits
- Develop alternative scenarios of practices aimed at achieving the goals established in the Iowa Nutrient Reduction Strategy
 - Better understand effects from field to sub-watershed to larger watershed scales
- Incorporate changing hydrologic patterns into hydrologic models that predict water quantity and quality
 - Understand how hydrologic changes from weather and land management impact nutrient processing and E/ET



Iowa Water Center

- Identify vulnerable watershed areas based on
 - Slope
 - Soil type
 - Proximity to water
- Identify appropriate practices to address runoff and erosion vulnerability
- Estimate soil erosion and runoff with and without practice implementation



Tallgrass Prairie Center



- Provide technical assistance to each WMA in native vegetation establishment and management, including individual consultation
- Coordinate with partners to organize field days, workshops, and create demonstration sites for teaching and learning
- Provide print and online technical guides and videos
- Build a leadership network in prairie reconstruction techniques related to agriculture

Iowa Watersheds Project

Overview:

- In 2010, The Iowa Flood Center and IIHR—Hydroscience and Engineering at the University of Iowa were awarded funds from the U.S. Department of Housing and Urban Development (HUD) to prepare watershed mitigation projects directed toward flood damage reduction in select Iowa watersheds.

Specific Project Goals:

- Maximize soil water holding capacity from heavy precipitation
- Minimize severe scour erosion and sand deposition during floods
- Manage water runoff in uplands under saturated soil moisture conditions
- Reduce and mitigate structural and nonstructural flood damages

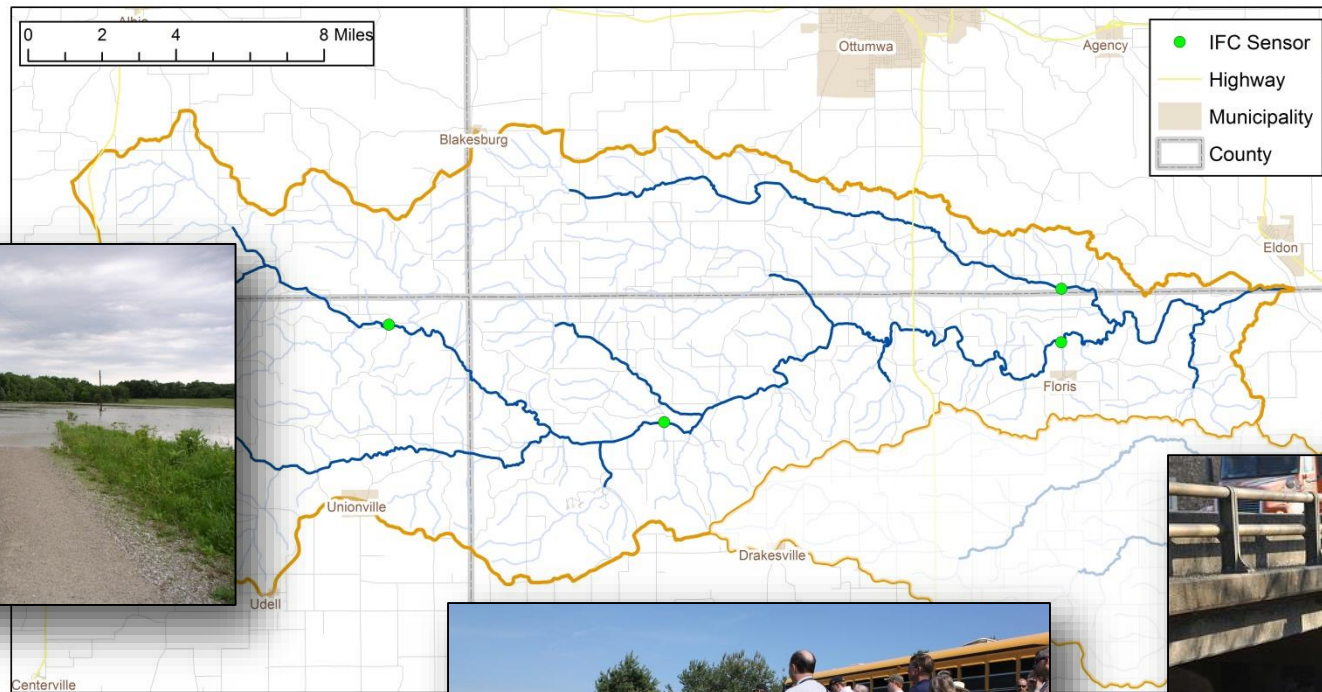


Soap Creek Watershed

1986 – Formation of Soap Creek Watershed Board – 28E

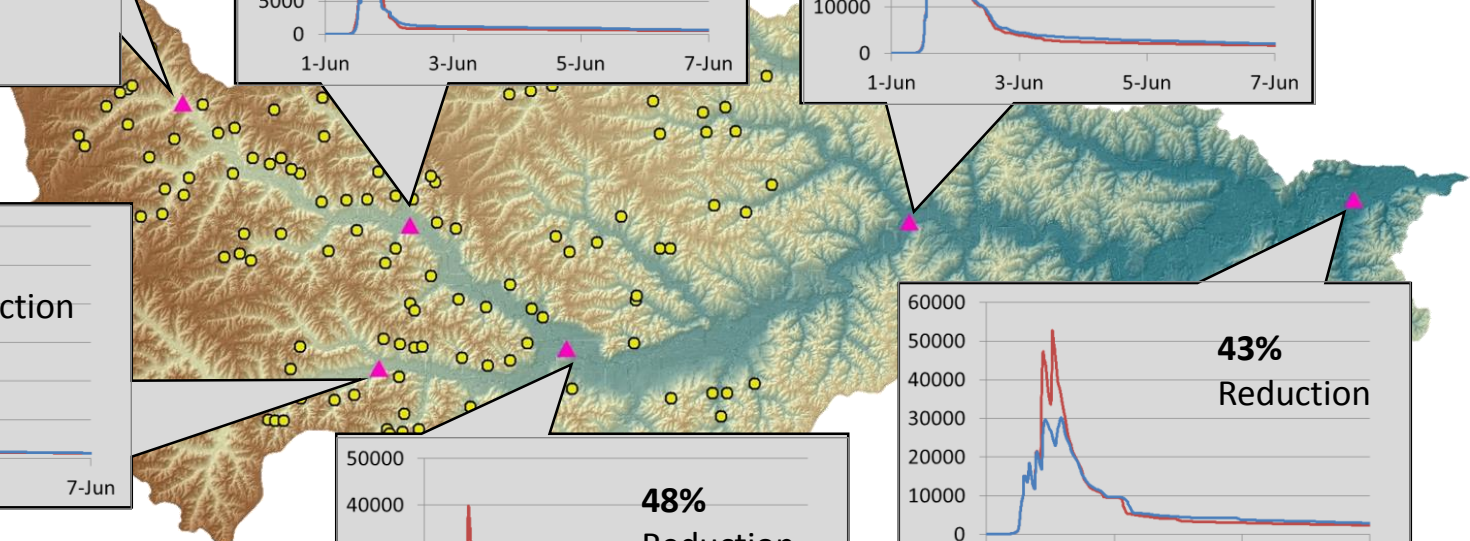
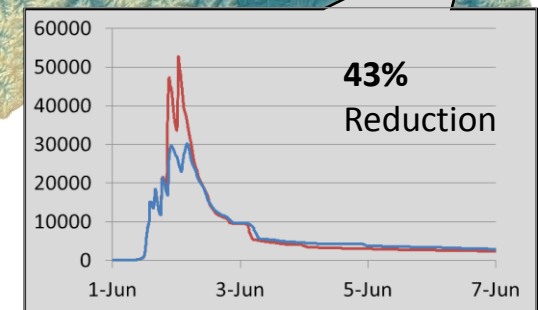
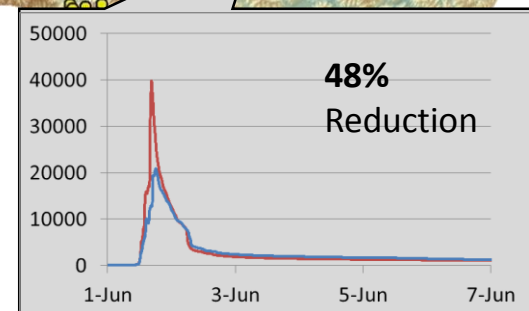
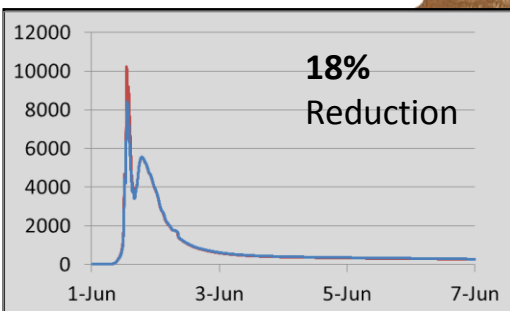
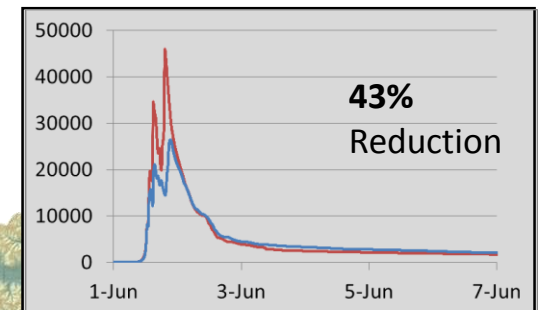
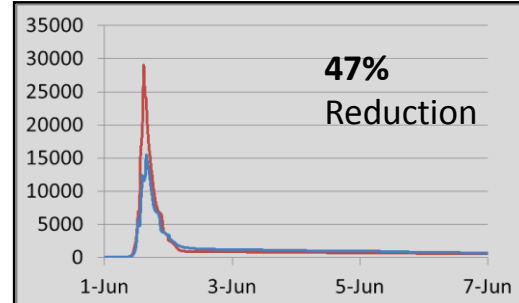
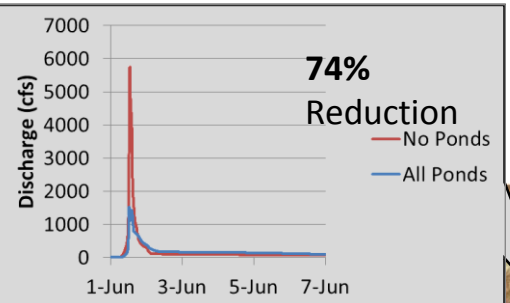
1988 – Study identifies 154 project locations to reduce flooding

2012 – 132 watershed projects complete

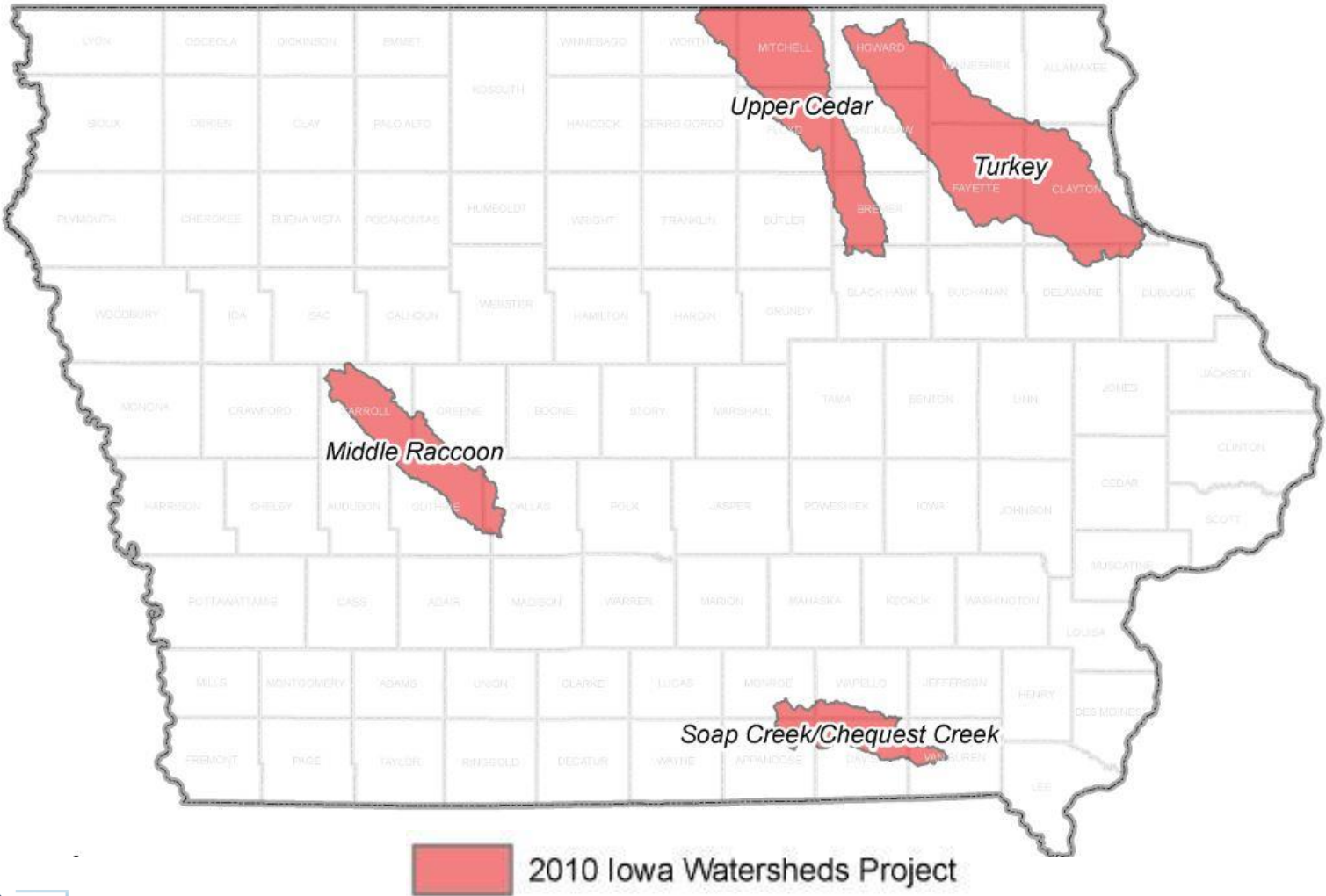


Reduction in Peak Flow

100 yr Storm, 7.5" inches of rain in 24 hours

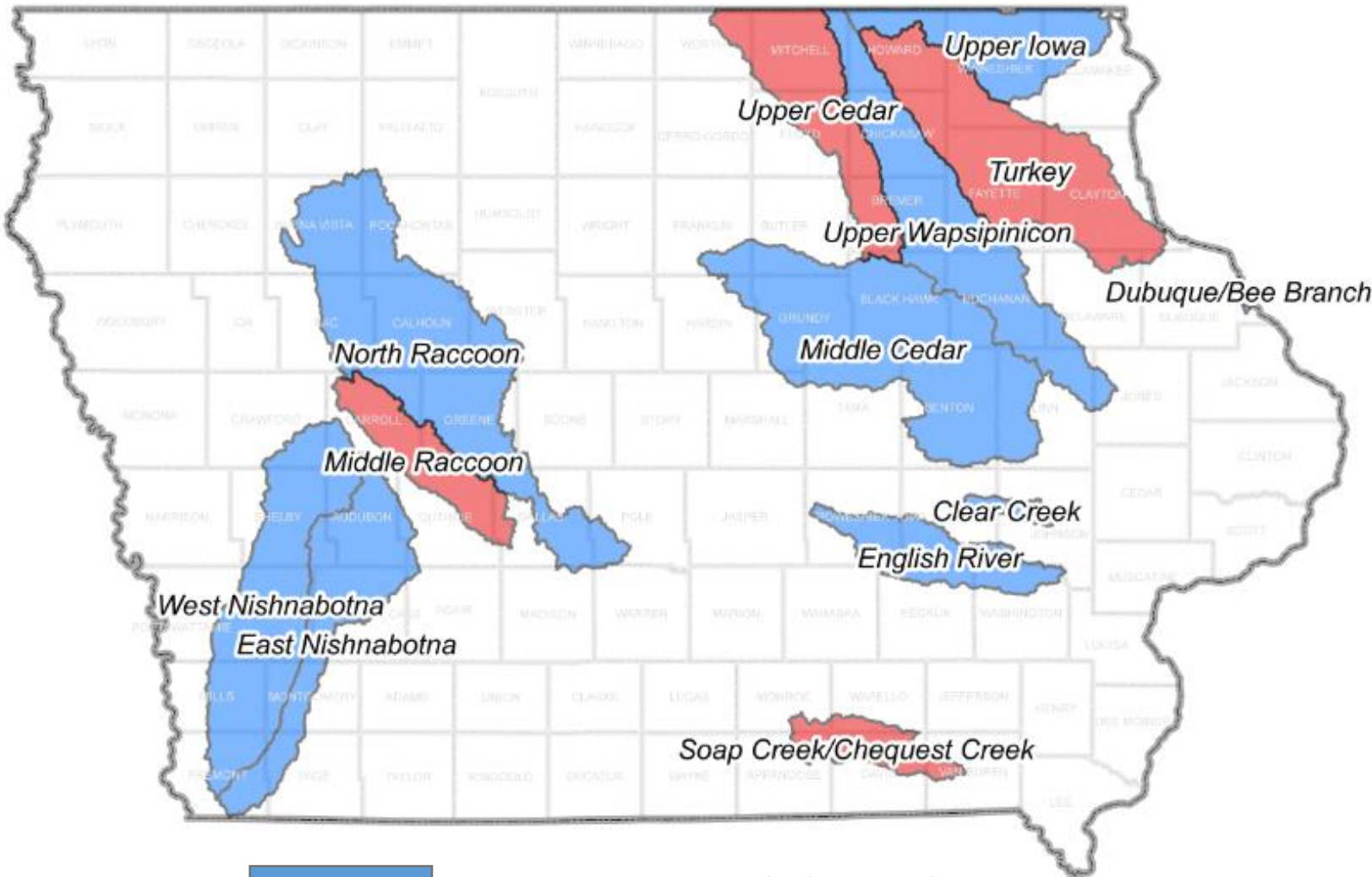




Iowa Watersheds Project



The Iowa Watershed Approach

a vision for a more resilient Iowa

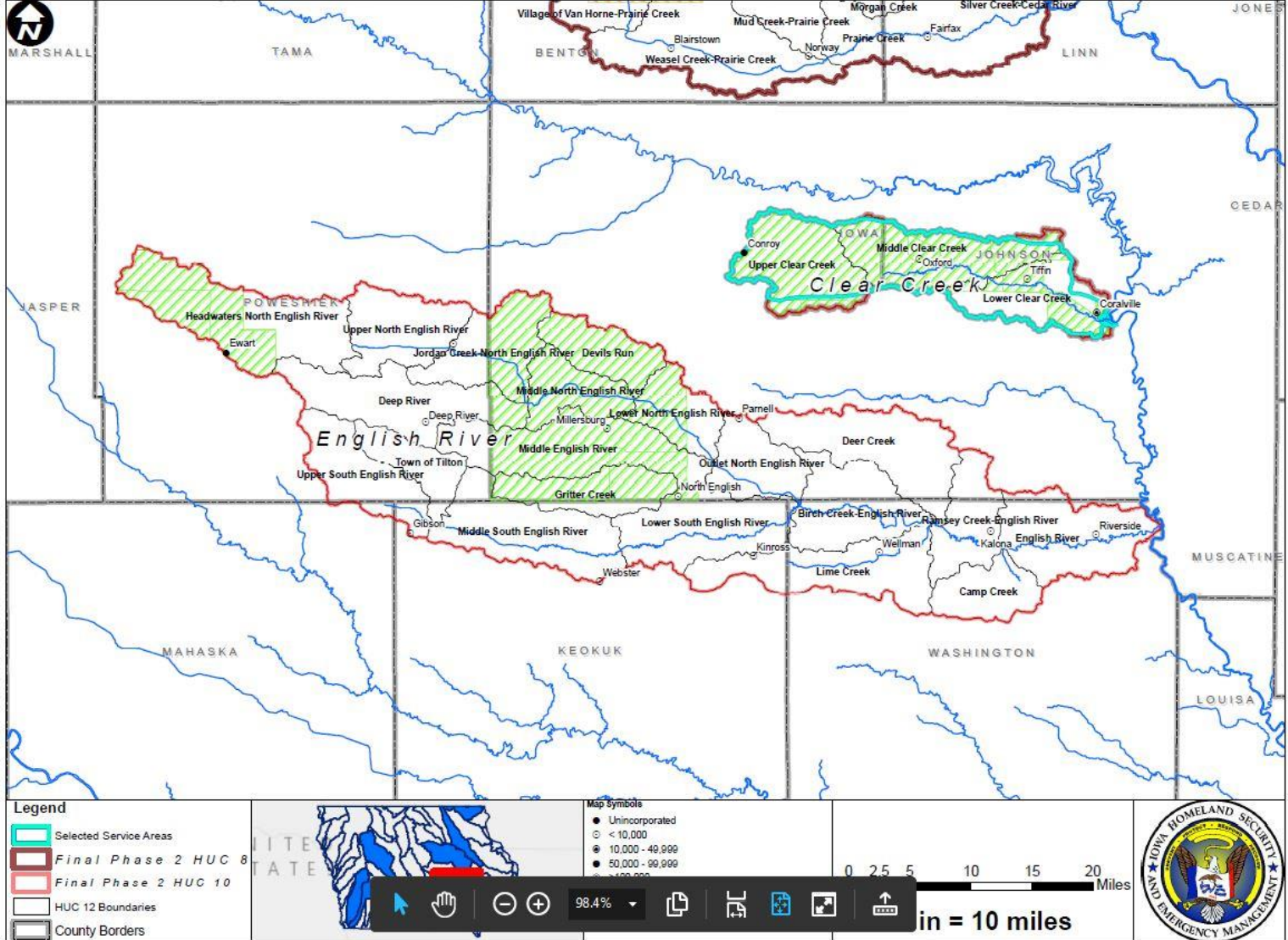


-  2016-2021 Iowa Watershed Approach
-  2010-2015 Iowa Watersheds Project

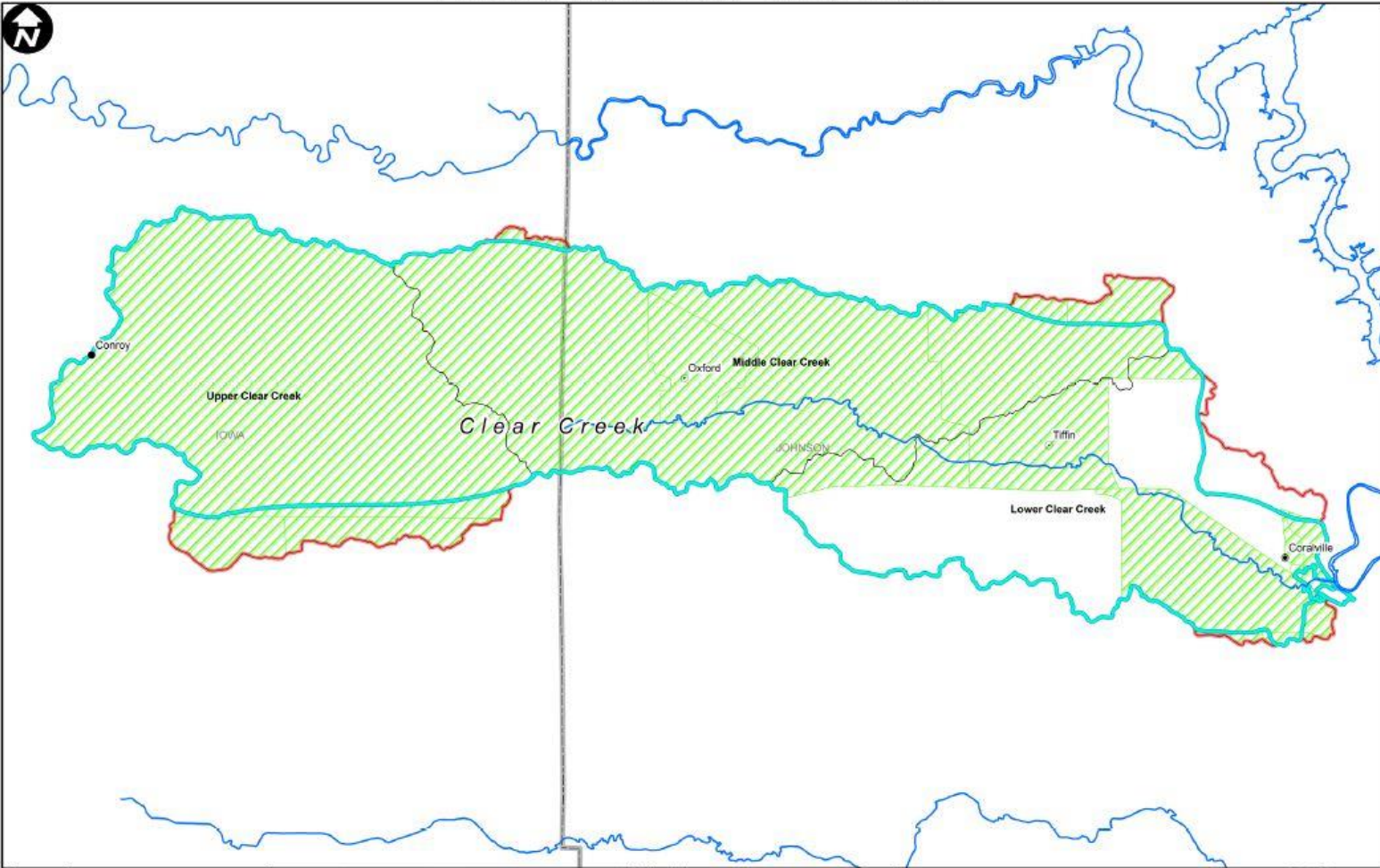
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a vision for a more resilient Iowa

Phase 2 Watersheds - English River/Clear Creek

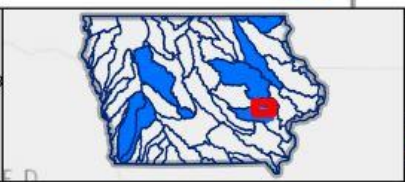


Phase 2 Watersheds - Clear Creek



Legend

- Selected Service Areas
- Final Phase 2 HUC 8
- Final Phase 2 HUC 10
- HUC 12 Boundaries
- County Borders



Map Symbols

- Unincorporated
- < 10,000
- 10,000 - 49,999
- 50,000 - 99,999
- >100,000
- WQI HUC 12
- MID-URN Environmental Area
- MID-URN Infrastructure Area

0 0.75 1.5 3 4.5 6 Miles

1 in = 3 miles



National Disaster Resilience Competition

| | |
|--|---------------------|
| ISU Planning (Extension, Water Center, Nutrient Center) | \$2,112,500 |
| IaDNR Planning (WMA Formation & Assistance) | \$576,000 |
| UI CEA Planning (Program Evaluation) | \$482,863 |
| IHR/IFC Planning (Phase 1 Hydrologic Assessment) | \$3,125,000 |
| IHR/IFC Planning (WMA Adv Board and Training) | \$812,500 |
| UNI Planning (Tallgrass Prairie Center) | \$438,750 |
| HSMED Planning (Data Support and Flood Mitigation Board) | \$1,776,852 |
| HSMED Planning-PreAgreement CostsApplication | \$50,500 |
| IFC Planning-PreAgreement CostsApplication | \$62,000 |
| Dubuque Planning-PreAgreement CostsApplication | \$52,100 |
| IDALS Planning (Coordination w/WQI) | \$250,000 |
| UI IFC/CEA (+CAP) Resilience Planning | 3,689,513 |
| Total Planning | \$13,428,578 |

| | |
|-------------------------|---------------------|
| Infrastructure Projects | |
| Dubuque | \$31,527,665 |
| Storm Lake | \$6,474,750 |
| Coralville | \$1,834,800 |
| Total | \$39,837,215 |

| | | |
|----------------------------|----------------------------------|---------------------|
| Watershed Related Projects | | |
| Counties | Project Coordinators | \$2,250,000 |
| SWCD/NRCS/Contract | Design | \$1,511,792 |
| Counties | Practices | \$29,947,500 |
| IHR/IFC | Modeling, Data Analysis, Sensors | \$5,303,179 |
| Total | | \$39,012,471 |

admin \$4,608,913

Grand Total \$96,887,177

Draft Budget
Subject to
Change
Pending
Final HUD
Agreement

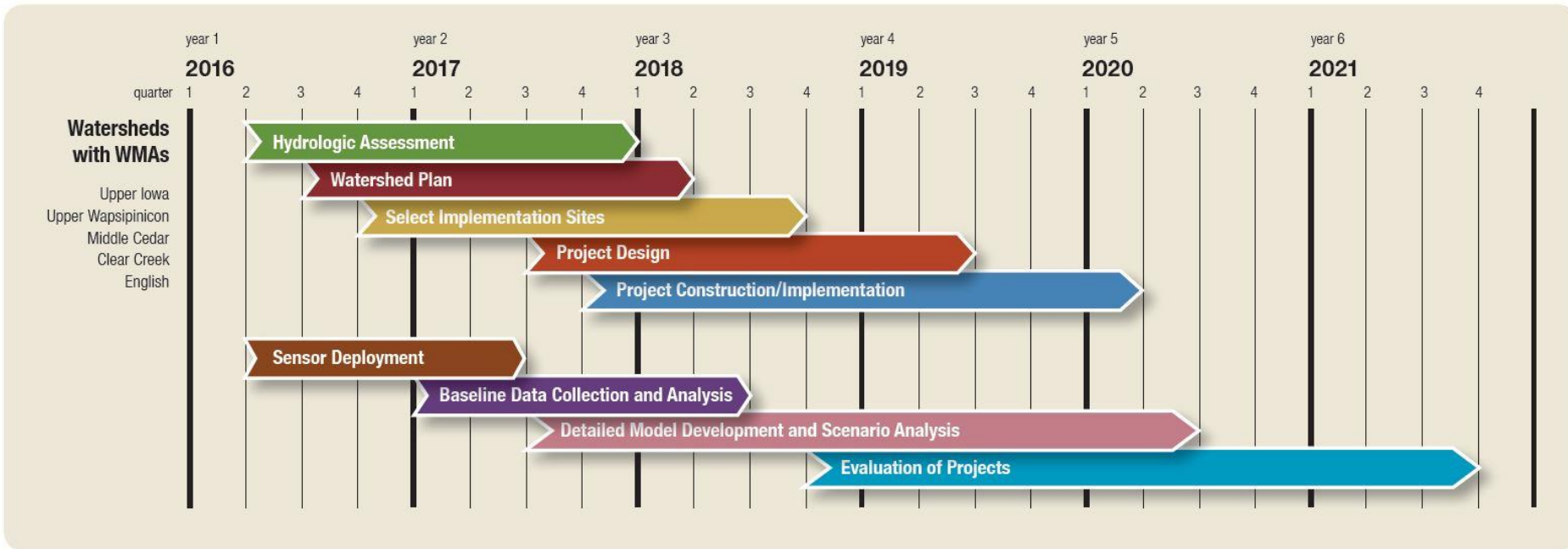
National Disaster Resilience Competition

Clear Creek Watershed

| | |
|--|--------------------|
| Practices (County) | \$3,037,500 |
| Project Coordinator (County) | \$375,000 |
| Planning, hydrologic assessment, design (IFC/County) | \$505,781 |
| Model/Sensors/Data Collection & Evaluation (IFC) | \$505,065 |
| | \$4,423,346 |

Draft Budget
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Project Timeline





Iowa Flood Center
The University of Iowa
100 C. Maxwell Stanley Hydraulics Laboratory
Iowa City, IA 52242
319-384-1729 (office)

For more information, visit
www.iowafloodcenter.org

