



A vision for a more resilient Iowa

The Iowa Watershed Approach

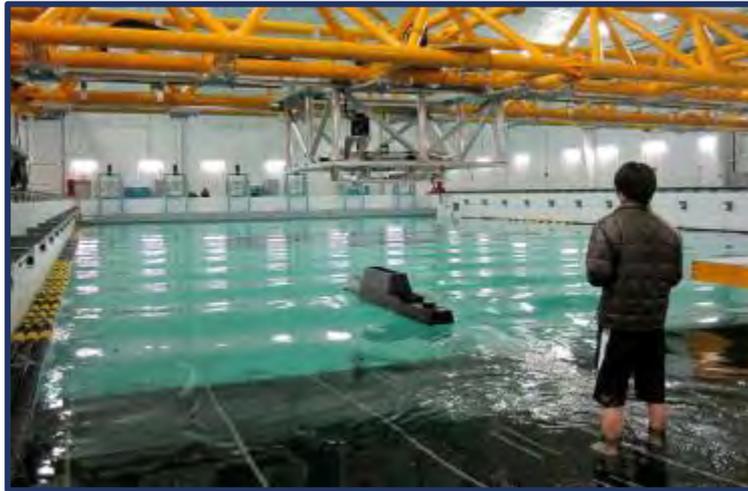
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IIHR—Hydrosience & Engineering



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.





Iowa Flood Center's Goals



- Provide accurate, science-based information to help Iowans better understand flood risks
- Develop hydrologic models for physically-based frequency estimates and real-time flood forecasting
- Establish community programs to improve flood monitoring
- Develop strategies to mitigate and prevent future flood damage
- Develop Iowa's workforce in flood-related fields

Iowa Watersheds Project

- August 2010, HUD announces \$312M for Disaster Recovery Enhancement Fund (DREF) to 13 states in response to flood mitigation efforts
- Iowa received the largest grant of \$84.1M of CDBG funds
- \$10M allocated to watershed demonstration projects directed toward flood damage reduction and educational programming
- \$8.8M set aside for watershed demonstration projects overseen by the Iowa Flood Center
- \$800K was used to establish the first WMAs in Iowa



Iowa Watersheds Project Goals

- Establish WMAs
- Complete hydrologic assessments
- Identify priority subwatersheds
- Develop watershed plans
- Work with volunteer landowners to implement small-scale flood mitigation projects in pilot subwatersheds
 - 75/25 cost share assistance
- Evaluate project performance and replicability at a larger scale
 - Deploy dense instrumentation network to track watershed conditions



The Iowa Watershed Approach



Beaver Creek: 6 wetlands

Otter Creek: 5 on-road structures, 19 farm ponds, 5 WASCOBS

Soap/Chequest Creek: 22 farm ponds, 106 WASCOBS



Beaver Creek Wetlands

- Increase flood storage by 141%
- Reduce peak flows near project outlets by 20-90% for small (10-year) and large (50-year) floods
- Reduce downstream peak flows on Beaver Creek by 10-30% for small (10-year) and large (50-year) floods
- Capture 40-86 percent of incoming nitrate that would otherwise enter Beaver Creek



National Disaster Resilience Competition

- **Funder:** US Dept. of Housing and Urban Development, in collaboration with the Rockefeller Foundation
- **Funding level:** \$1B; CDBG; Superstorm Sandy
- **Applicant:** State of Iowa, Iowa Economic Development Authority (IEDA)
- **Iowa Watershed Approach program** developed by IFC in consultation with many, many partners

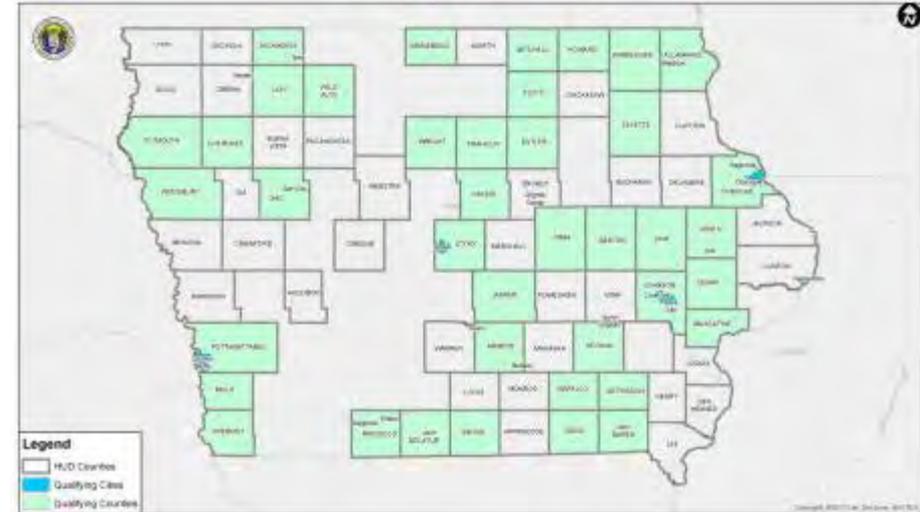


The Iowa Watershed Approach

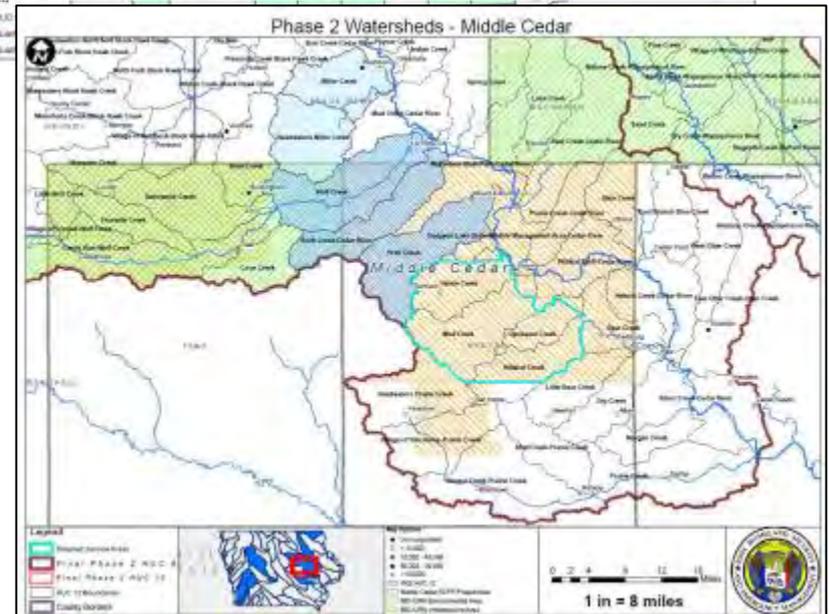
NDRC Qualifications

- Presidential Declared Major Disaster in 2011, 2012, or 2013
- Benefit to low to moderate income (LMI) areas
- Environmental and/or infrastructure most impacted and distressed and unmet recovery needs areas (MID-URN) present

Qualifying Areas Submitted to HUD



Phase 2 Watersheds - Middle Cedar



The Iowa Watershed Approach

Iowa Watershed Approach: \$97,887,177



The Iowa Watershed Approach

IWA 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



The Iowa Watershed Approach

IWA Project Description

- **Built off the framework of the IWP**
- Establish a WMA
- Develop a hydrologic assessment and watershed plan
- Deploy monitoring equipment
- Work with *project coordinators* and volunteer landowners to implement projects that reduce the magnitude of downstream flooding and improve water quality
- Assess project benefits based on monitoring and modeling data

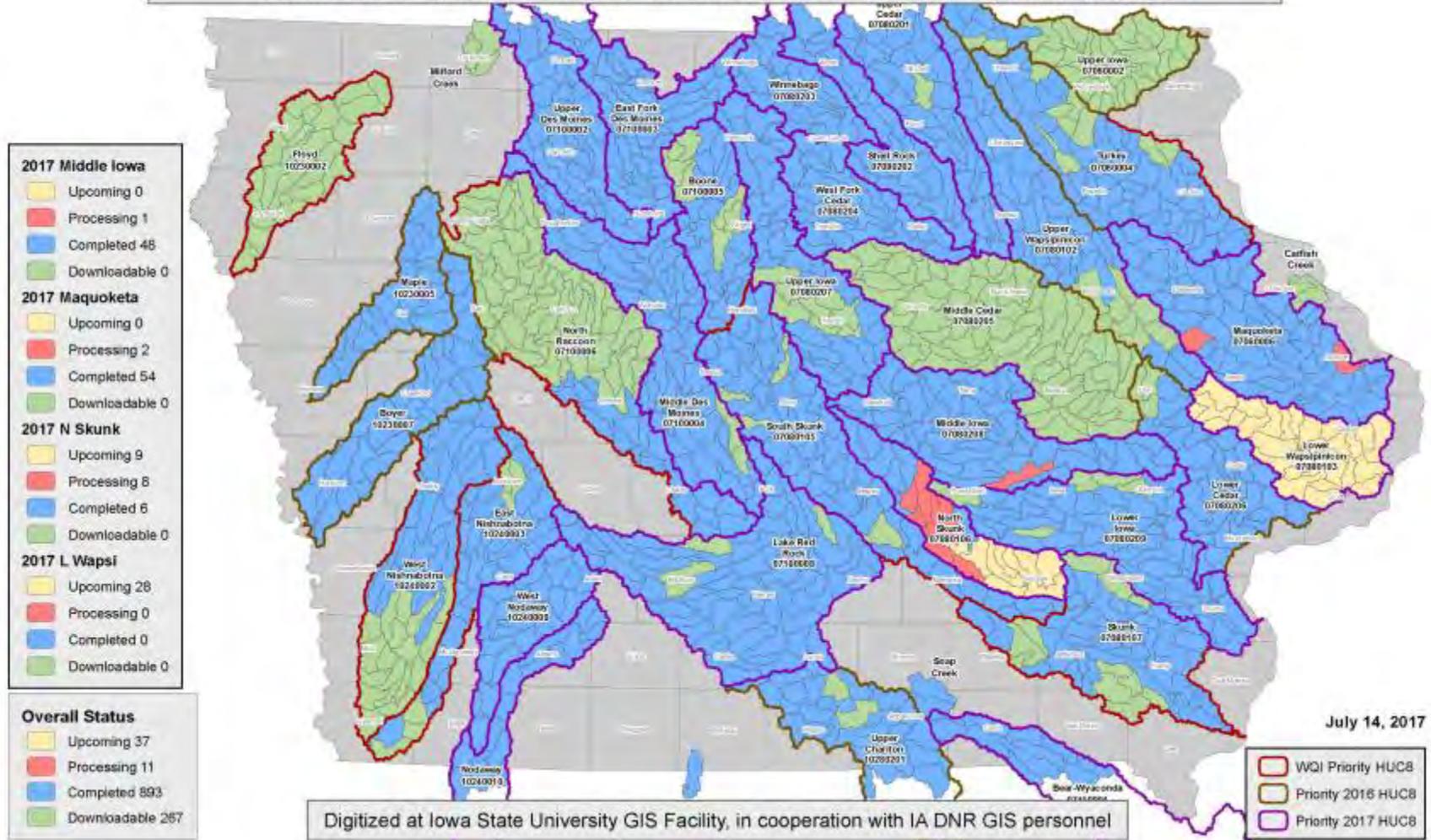


Hydrologic Assessment

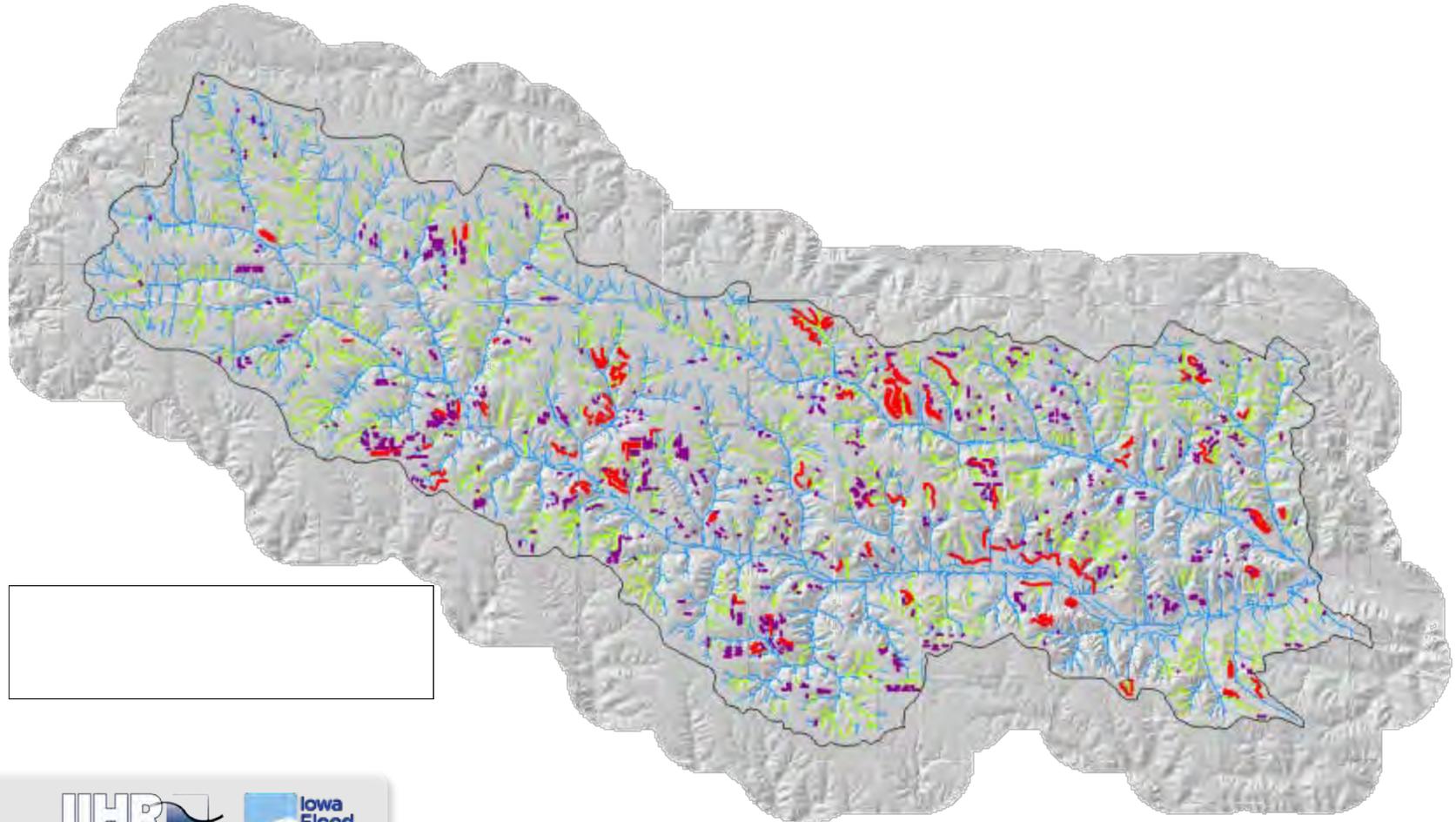
- Iowa's Flood Hydrology and Water Quality
- Conditions in each IWA Watershed
 - Hydrology
 - Geology and Soils
 - Topography
 - Land Use
 - Instrumentation/Data records
- BMPs: Existing and Potential
- Hydrologic Model
- Watershed Scenarios

The Iowa Watershed Approach

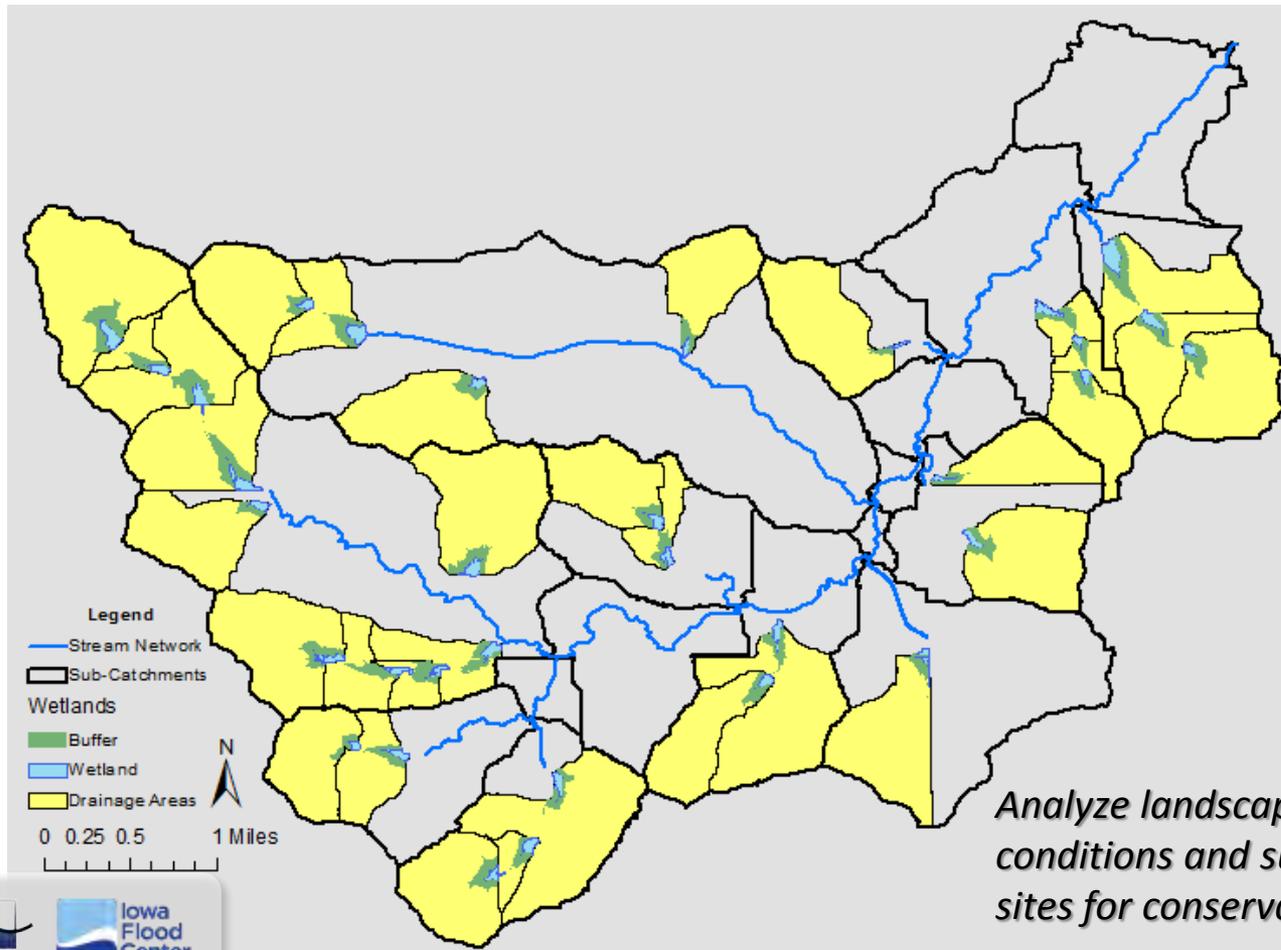
Best Management Practices Inventory HUC 12 Watershed Status
 Summer 2017 Focus HUC 8: Middle Iowa; Maquoketa; North Skunk; Lower Wapsipinicon



Existing BMPs in Headwaters North English River

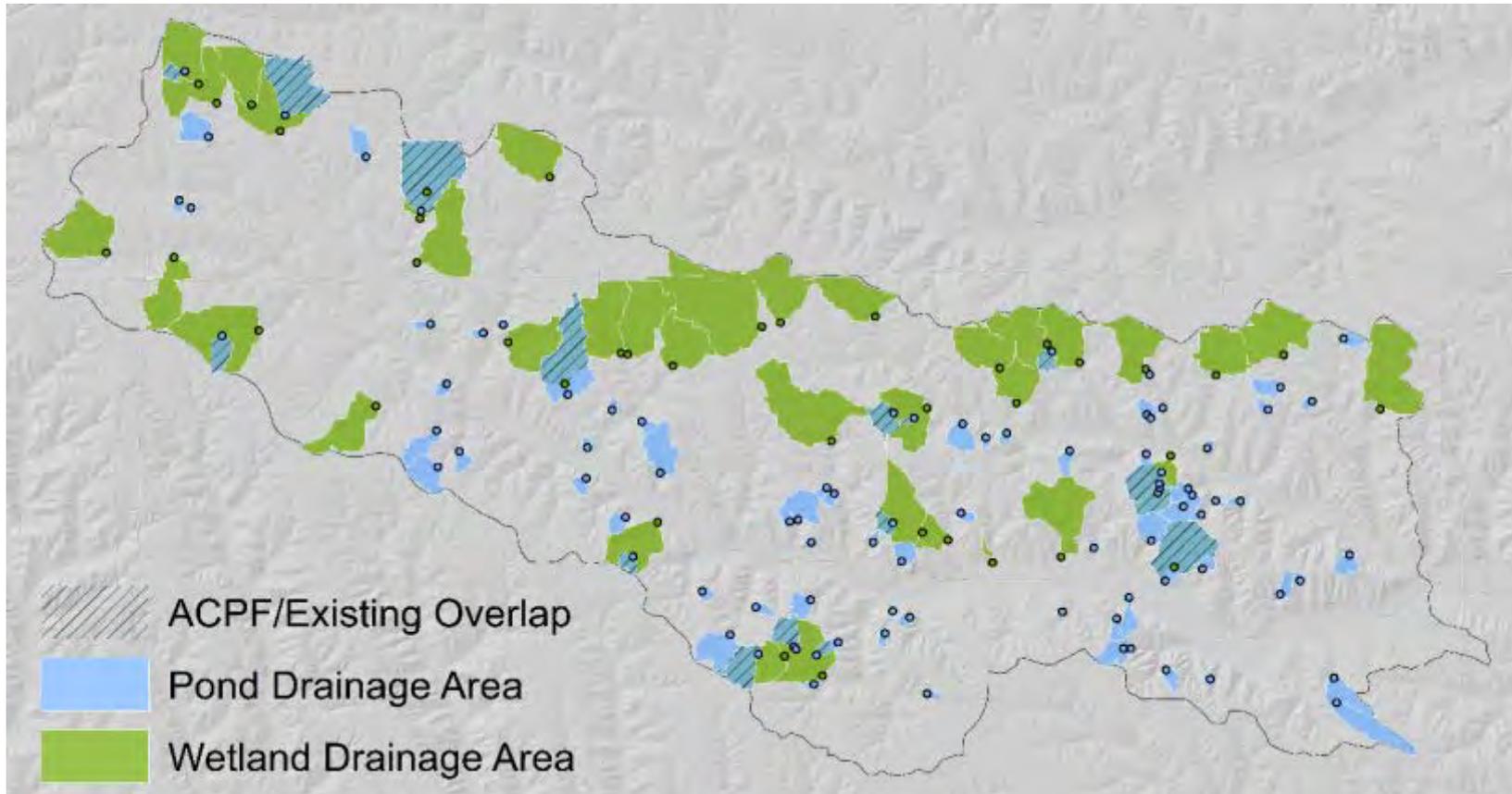


Agricultural Conservation Planning Framework (ACPF)



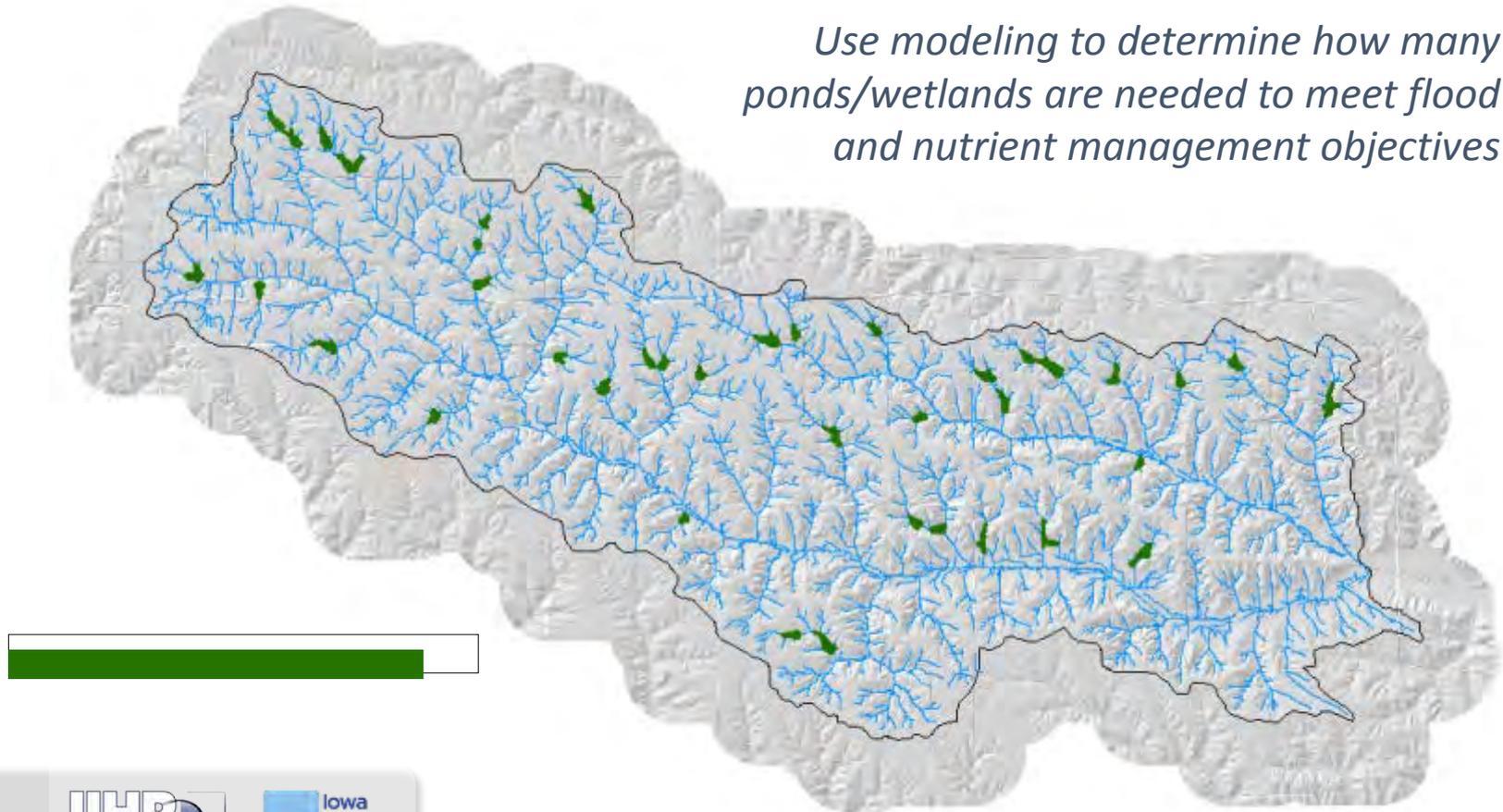
Analyze landscape and runoff conditions and suggest potential sites for conservation practices

Ponds and Wetlands in Headwaters N. English River



ACPF Wetlands in Headwaters N. English River

Use modeling to determine how many ponds/wetlands are needed to meet flood and nutrient management objectives



Data Collection & Monitoring



The Iowa Watershed Approach

IFIS Iowa Flood Information System

The screenshot displays the IFIS web application interface. The main map shows the state of Iowa with various gauges marked by yellow triangles. A detailed gauge information window is open for the 'Near IA-3 at Edgewood' gauge. This window includes a 'Rain / Soil Moisture Gauges' section with a bar chart showing 'Daily Rainfall Accumulation (in)' from 10/13 to today. The chart shows zero rainfall for all days. Below this is a 'SOIL MOISTURE INFO' and 'RAIN GAUGE INFO' section. A 'IFC RAIN GAUGE' pop-up window is also visible, providing details for the Edgewood gauge: City: Edgewood, Road: IA-3, Station ID: TLI18 (IFC), Last Reported: Tue, October 17, 2017 8:15 am, and Last Reading: no rain. This pop-up also features a weather forecast bar chart from Oct 9 to Oct 14, showing conditions like 'Partly Cloudy', 'Rain', 'Cloudy', 'Cloudy', 'Thunderstorm', and 'Thunderstorm'. On the right side of the map, a 'STATE OF IOWA' information box lists Population: 3,046,255 and Land Area: 55,872 sq mi. Below this is a 'Flood Alerts (observations)' section. The bottom right corner of the interface contains the URL <http://ifis.iowafloodcenter.org/ifis/en/app/> and the IFIS logo.

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Iowa Water Quality Information System

IOWA WQIS

West Nishnabotna River, Randolph, IA

Nitrate + Nitrite as N Gauge (USGS)

Sensor ID : 04080500

Recent Nitrate + Nitrite as N : 4.4 mg/L

Last Reported: Tue, Sep 19, 2017 05:00 pm

Nitrate + Nitrite as N mg/L

11 10mg/L drinkable threshold

9 8 7 6 5 4 3

9/15 9/16 9/17 Yesterday Today

ANNUAL MORE DATA

STATE OF IOWA

Population 3,046,355

Land Area 55,872 sq mi

Nitrate + Nitrite as N

Nitrate- and Nitrite-Nitrogen are ionic compounds of nitrogen and oxygen. These are common contaminants of drinking water and affect the health of lakes. [Read more](#)

LEGEND

- No Recent Data
- <5 mg/l
- 5-10 mg/l
- 10-15 mg/l
- 15-20 mg/l
- >20 mg/l
- USGS Gauge (w/ dot)
- USDA Gauge (w/ chevron)
- IHR Gauge (w/ dot)

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

IOWIS



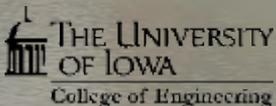
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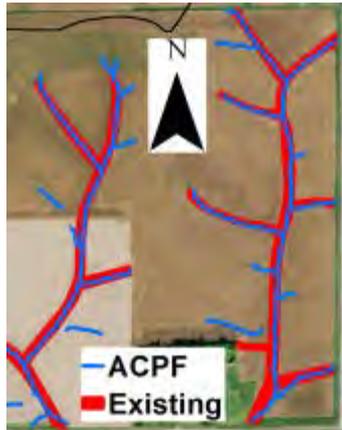
www.iowafloodcenter.org



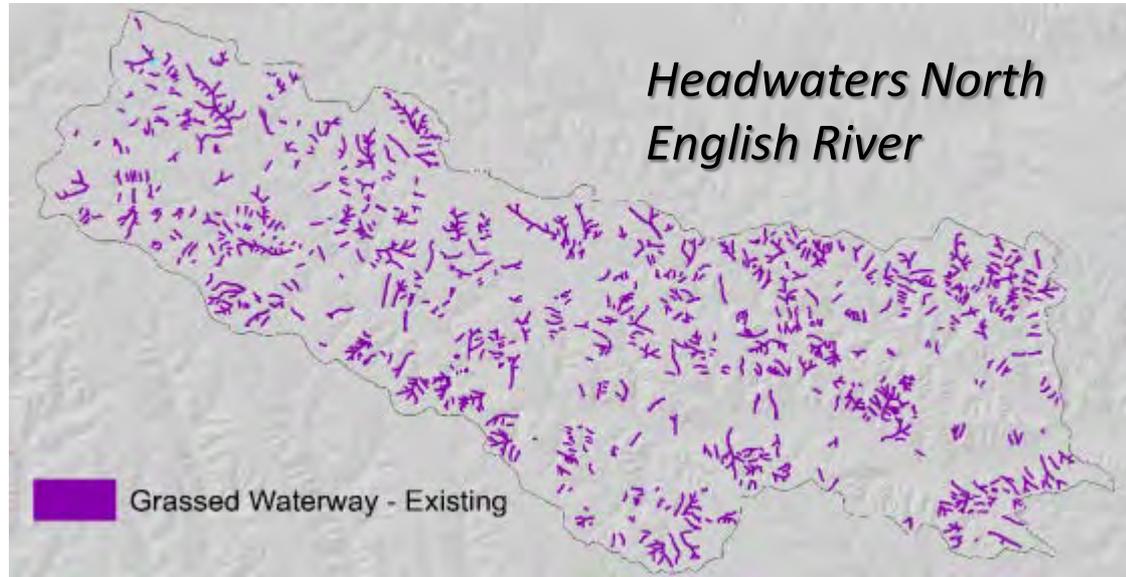
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Grassed Waterways

185.2 miles of existing grassed waterways



348.9 miles of ACPF grassed waterways

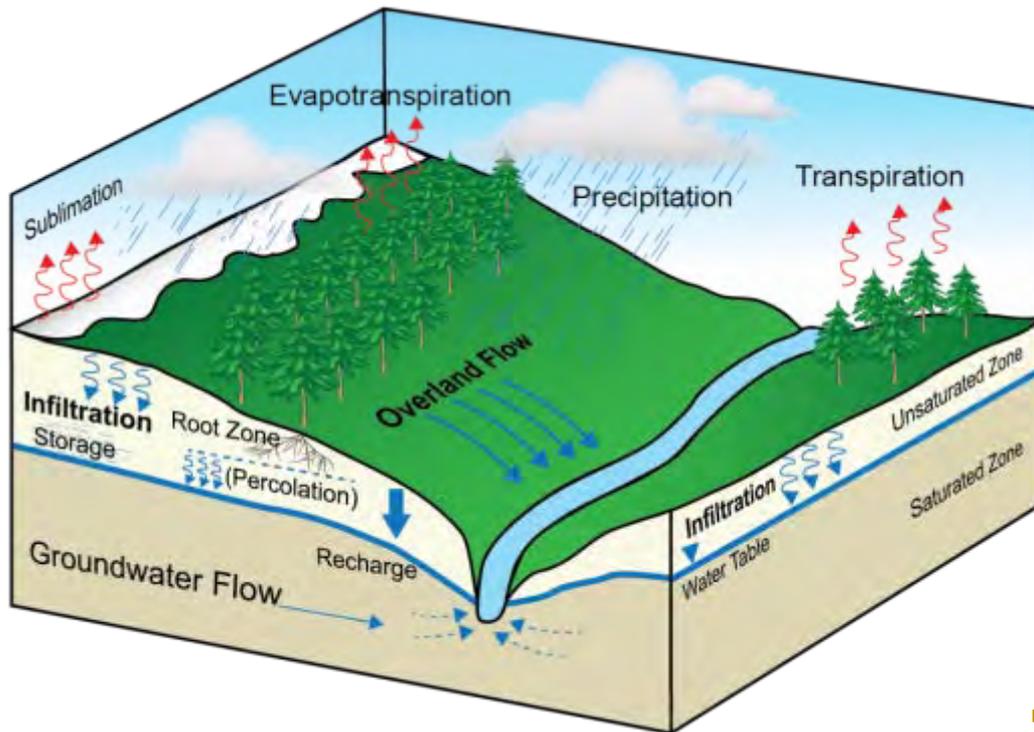


Headwaters North English River



Grassed Waterways - ACPF

Modeling



- Develop and run watershed-scale hydrologic models (PIHM) to estimate watershed responses to rainfall events
 - Modeler breaks the watershed down into manageable and representative user defined areas
 - Simulate hydrologic processes using a physically-based approach
 - Compare simulated results to observed hydrologic time series (e.g. streamflow) to assess model performance
 - Quantify the impact of existing and potential BMPs
- Documentation

The Iowa Watershed Approach

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

