Iowa Watershed Projects

Overview of HUD Watershed Projects in Iowa

Larry Weber

Director, IIHR – Hydroscience and Engineering

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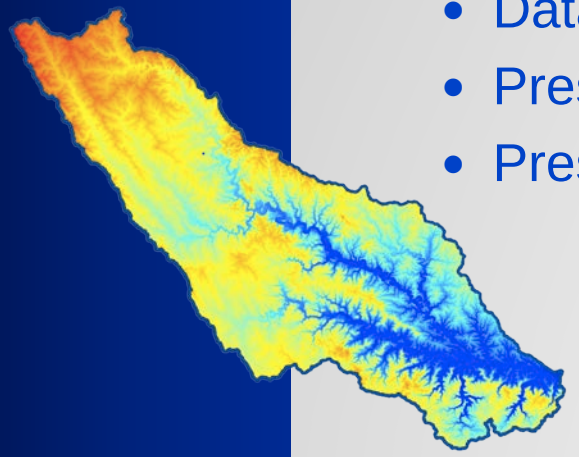
Kickoff Meeting

- Introduction to IIHR and Iowa Flood Center
- Project background
- Phase I – Hydrologic assessment & modeling approach
- Phase II – Project design & implementation
- Describe project timeline
- Data and information needs
- Present project deliverables
- Presentation from local watershed representatives



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IIHR Researchers

Forty-two research engineers and scientists work with 41 MS and 64 PhD students on cutting-edge fluids-related research, incorporating computational fluid dynamics with laboratory modeling and field observational studies

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Iowa Flood Center

In response to extreme flooding in 2008, the State of Iowa established (and funded) the new Iowa Flood Center at IIHR. The legislature appropriated $1.3M for the center in its first year (FY2010) and renewed at the same level for FY2011 and FY2012.

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www.iowafloodcenter.org

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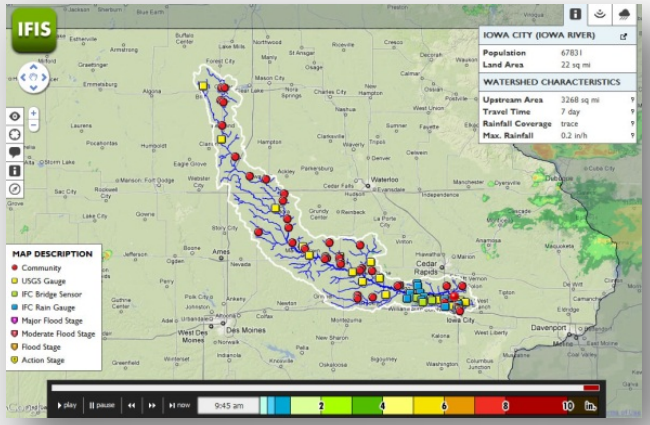
Iowa Flood Information System

The IFC's Iowa Flood Information System (IFIS) is a user-friendly, one-stop web platform, designed to allow access to:

- Community-based flood conditions
- Forecasts
- Visualizations
- Inundation maps
- Flood-related data, information, and applications



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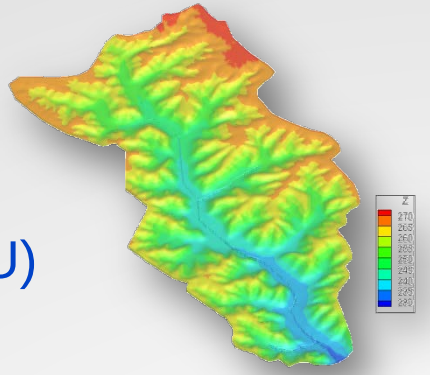
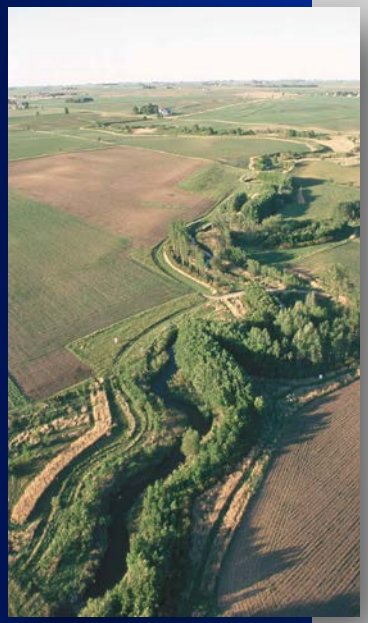
HUD Projects



- Four Distinct Projects
  - Agricultural Drainage Study (UI + ISU)
  - Iowa Watershed Project (UI)
  - Watershed Management Authority (IaDNR)
  - Education and Outreach (IaDNR + ISU Extension)
- Background
  - Originated from 2008 Disaster Funding
  - Conceptualized with the Rebuild Iowa Office
  - Must be used to benefit the 85 Presidentially Declared Disaster Counties
  - Addressed Needs Identified in the 2010 Legislative Session

Iowa Watershed Project



Overview:

- To plan, implement, and evaluate watershed projects to lessen the severity and frequency of flooding in Iowa

Specific Project Goals:

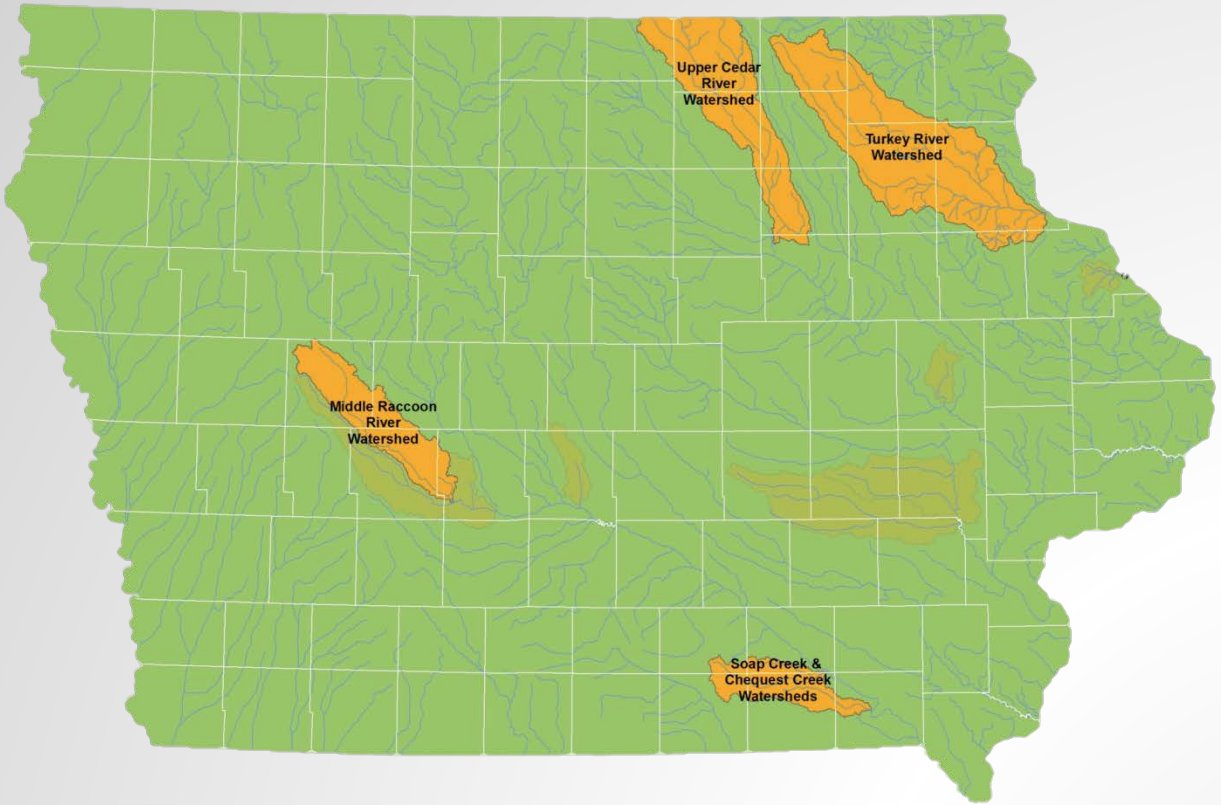
- Maximize soil water holding capacity from heavy precipitation
- Minimize severe scour erosion and sand deposition during floods
- Manage water runoff in uplands under saturated soil moisture conditions
- Reduce and mitigate structural and nonstructural flood damages

Phase I Overview

Hydrologic Assessment

- Watershed selection
  - Not larger than a HUC 8
- Community engagement
- Hydrologic model development and assessment
- Identify areas in the watershed where project implementation will meet overarching goals
  - HUC 12 scale

Phase I: Identify Watersheds



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Phase I: Identify Watersheds

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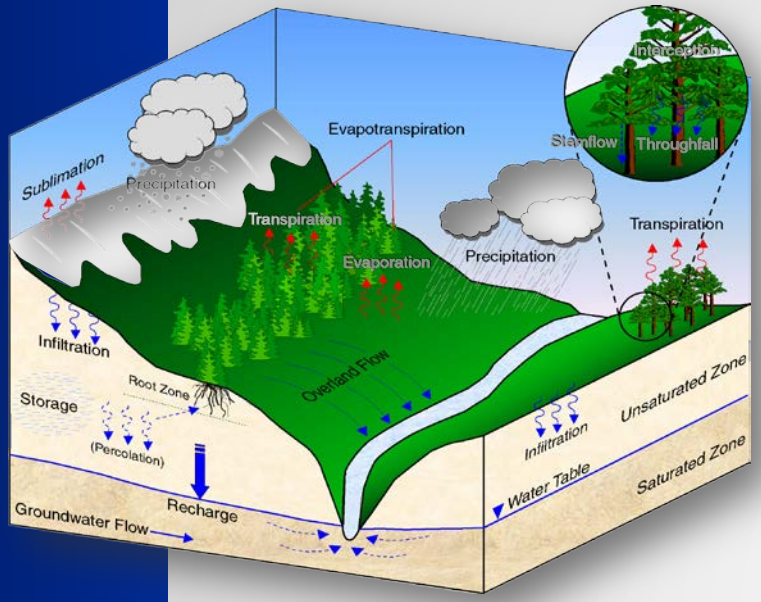
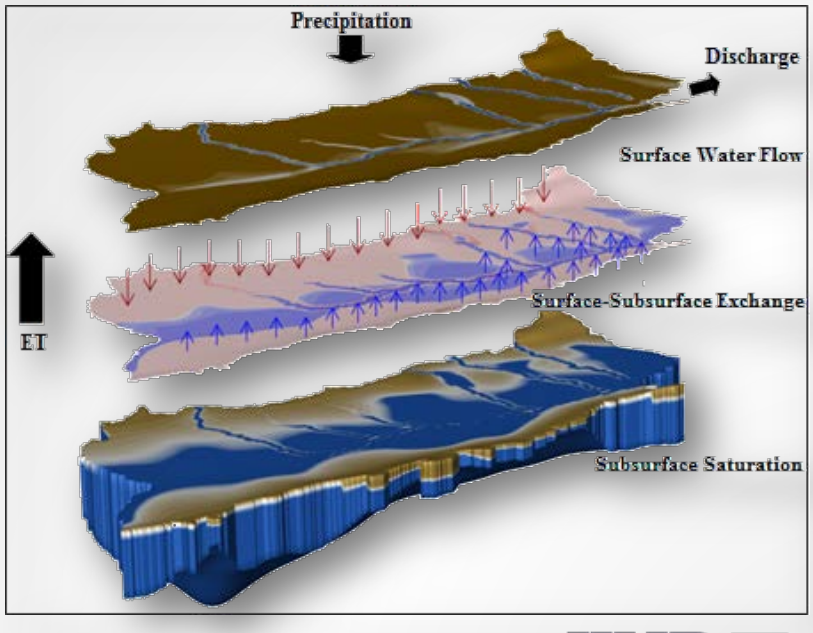
HydroGeoSphere – Integrated Physically-Based Modeling

- Attempt to account for all interactions between surface and subsurface flow regimes
- Rainfall partitioned between overland surface flow, evaporation, transpiration, and infiltration





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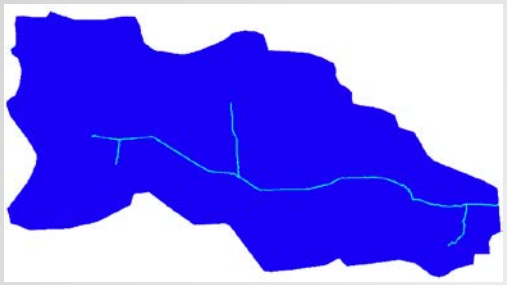
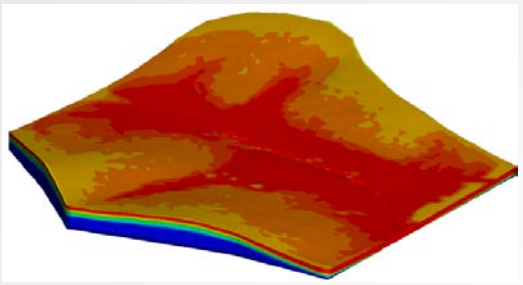
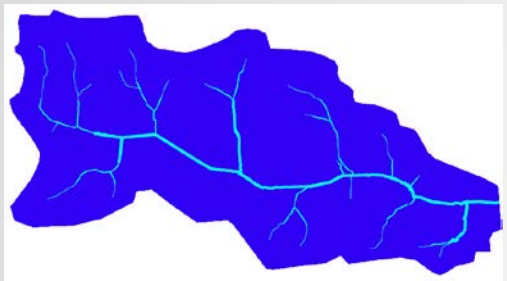
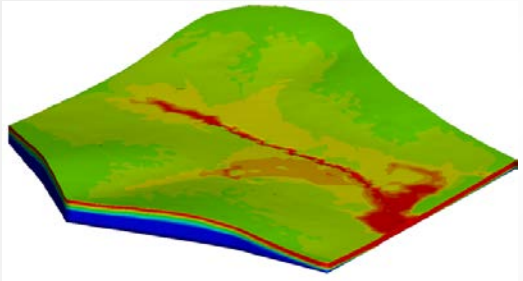
HydroGeoSphere – Typical Results

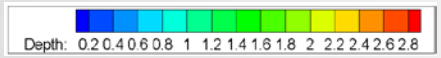
- Time/space varying solutions in surface and subsurface
- Depth, saturation, flow, infiltration, exfiltration, contaminant transport, etc.

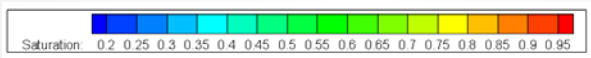






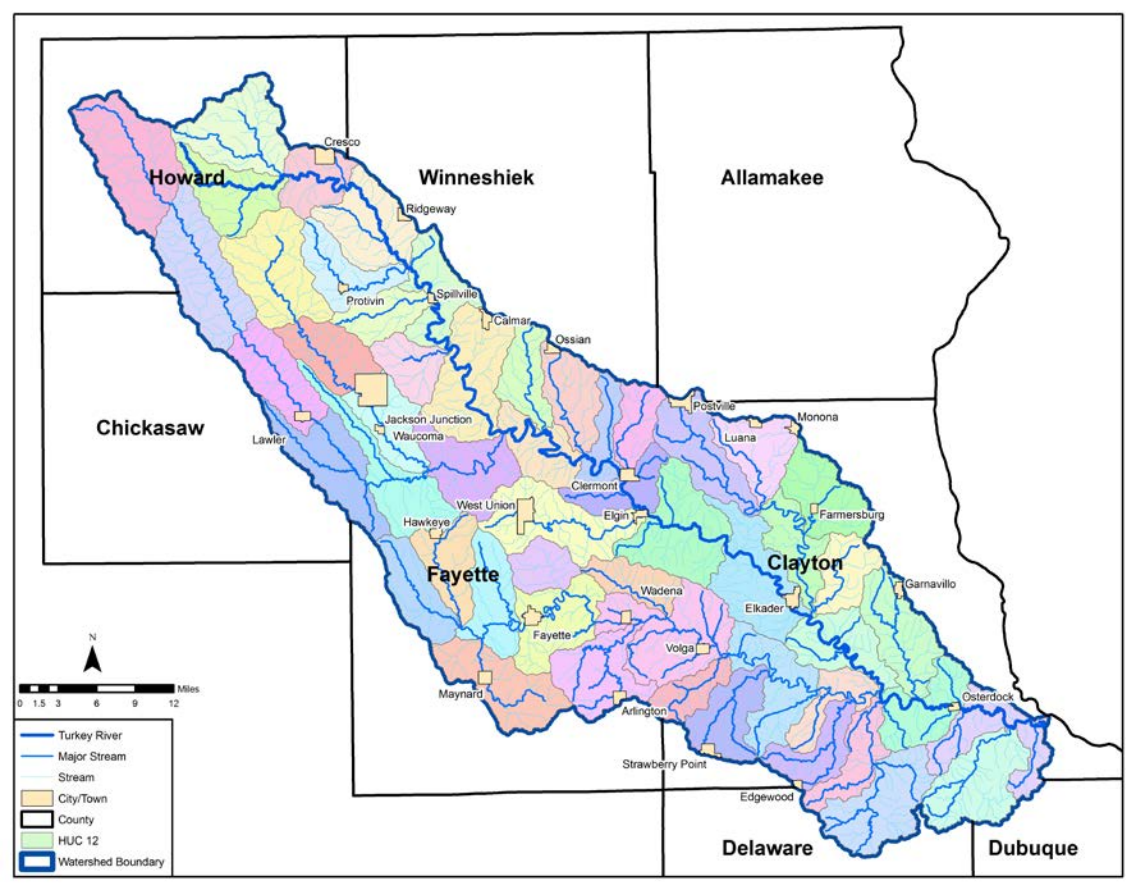






Phase I: Identify Locations

Project construction will occur at the HUC 12 scale



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Phase II Overview

Project Construction & Implementation

Project Types

- Active and passive distributed storage
- Floodplain restoration
- Buffer strip installation and enhancement
- Advanced tile drainage
- Urban/rural infiltration practices
- Floodplain easement acquisition

Engagement of Watershed Authority and Private Land Owners will be Vital to Project Success

Project Timeline

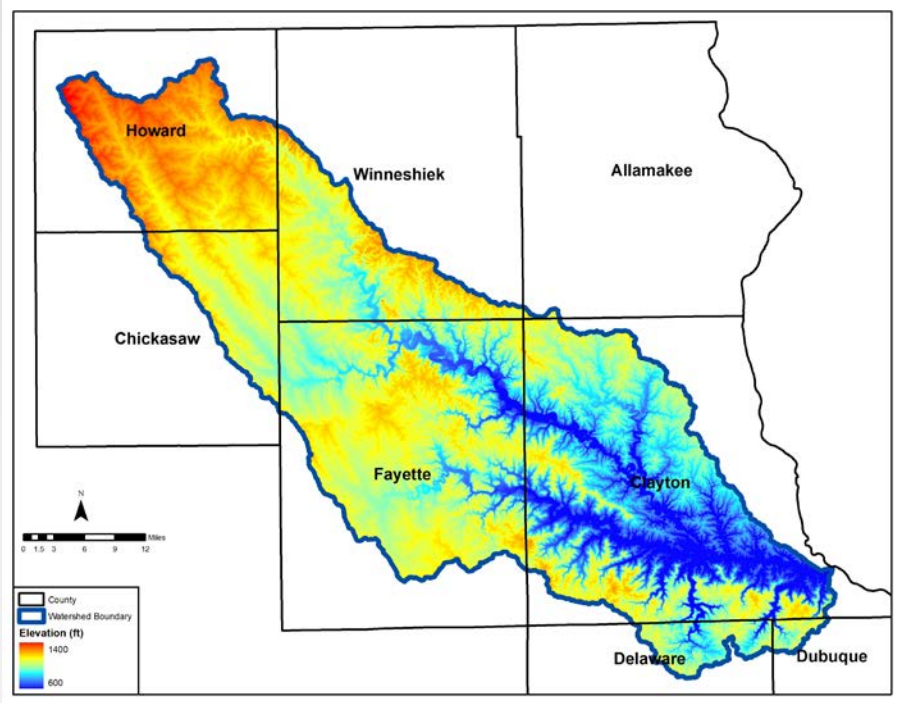
Phase I	
June 2012	Watershed kickoff meetings Commence data collection and watershed modeling
Fall 2012	Meeting to discuss model development & data needs
Winter 2013	Meeting to discuss initial findings of hydrologic modeling & community/landowner engagement in the watershed
Spring 2012-Ongoing	Continue quarterly meetings to discuss modeling progress, potential projects for implementation, share progress on other watershed activities
Fall 2013	Complete and present hydrologic assessment Identify HUC 12s for Phase II
Winter 2014	Finalize hydrologic assessment report

Project Timeline

Phase II	
Summer & Fall 2013	Explore project locations, commence project design
Winter & Spring 2014	Design projects
Summer 2014 – Summer 2015	Construct projects
Summer 2014 – 2017	Monitor & assess projects
Summer 2017	Finalize Phase II report

Turkey River Watershed

- Eight counties
- 1,084,086 acres
- Outlet to the Mississippi River
- Hydrologic Units
  - HUC 8 – Turkey River
  - HUC 12 – 53 total



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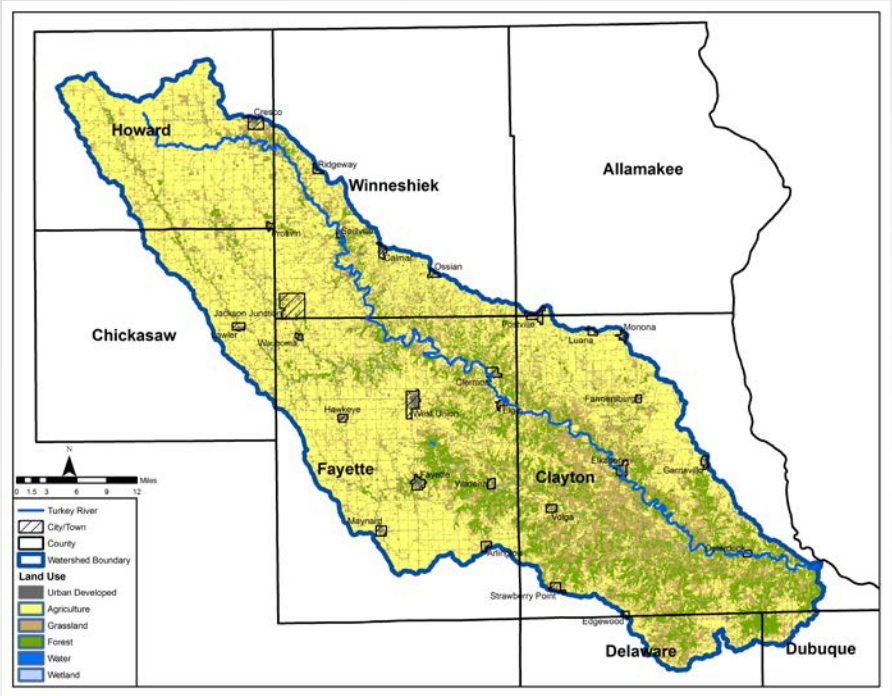
Turkey River Watershed

- Land Ownership
  - 91% private
- Land Coverage
  - Row crop 56%
  - Pasture 25%
  - Forest 16%
  - Developed 2%
  - Other 1%



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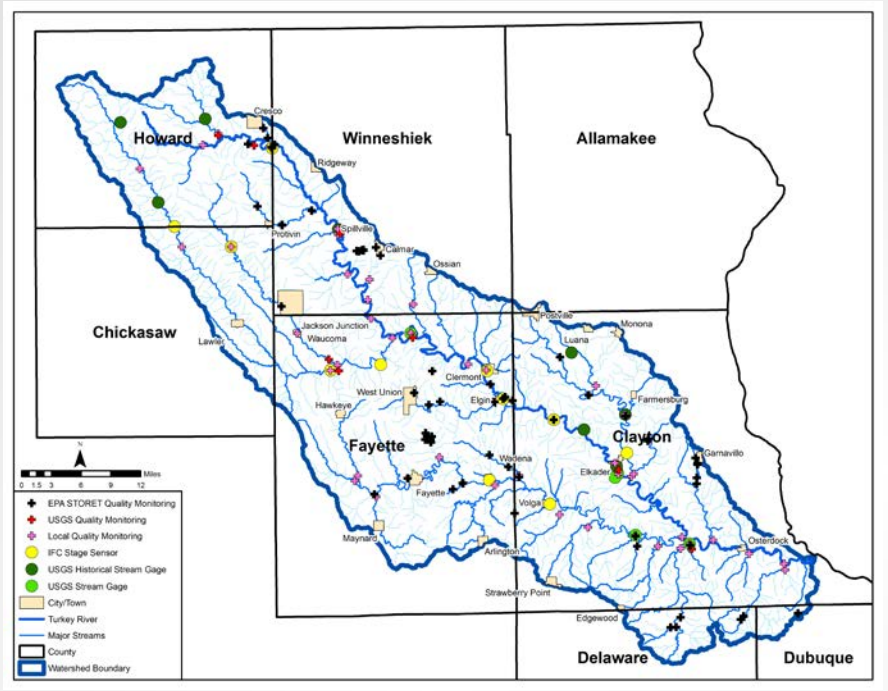
Turkey River Watershed

Data Sources

- Water quality
  - Field/lab samples, USGS
  - Surface, EPA STORET
  - IOWATER
  - Local Watershed Project Monitoring
- Groundwater
  - Quantity – Private well tracking system, IDNR
  - Quality – Iowa statewide rural well water survey, CHEEC
- Floodplain assessment factors
  - NRCS



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Watershed Activities

Turkey River Studies

- Rapid Watershed Assessment – NRCS
- Otter Creek Watershed Flood Mitigation Study – NRCS
- Impact of Levees in the Watershed
- Upper Cedar River surface water modeling – USGS

Turkey River Projects

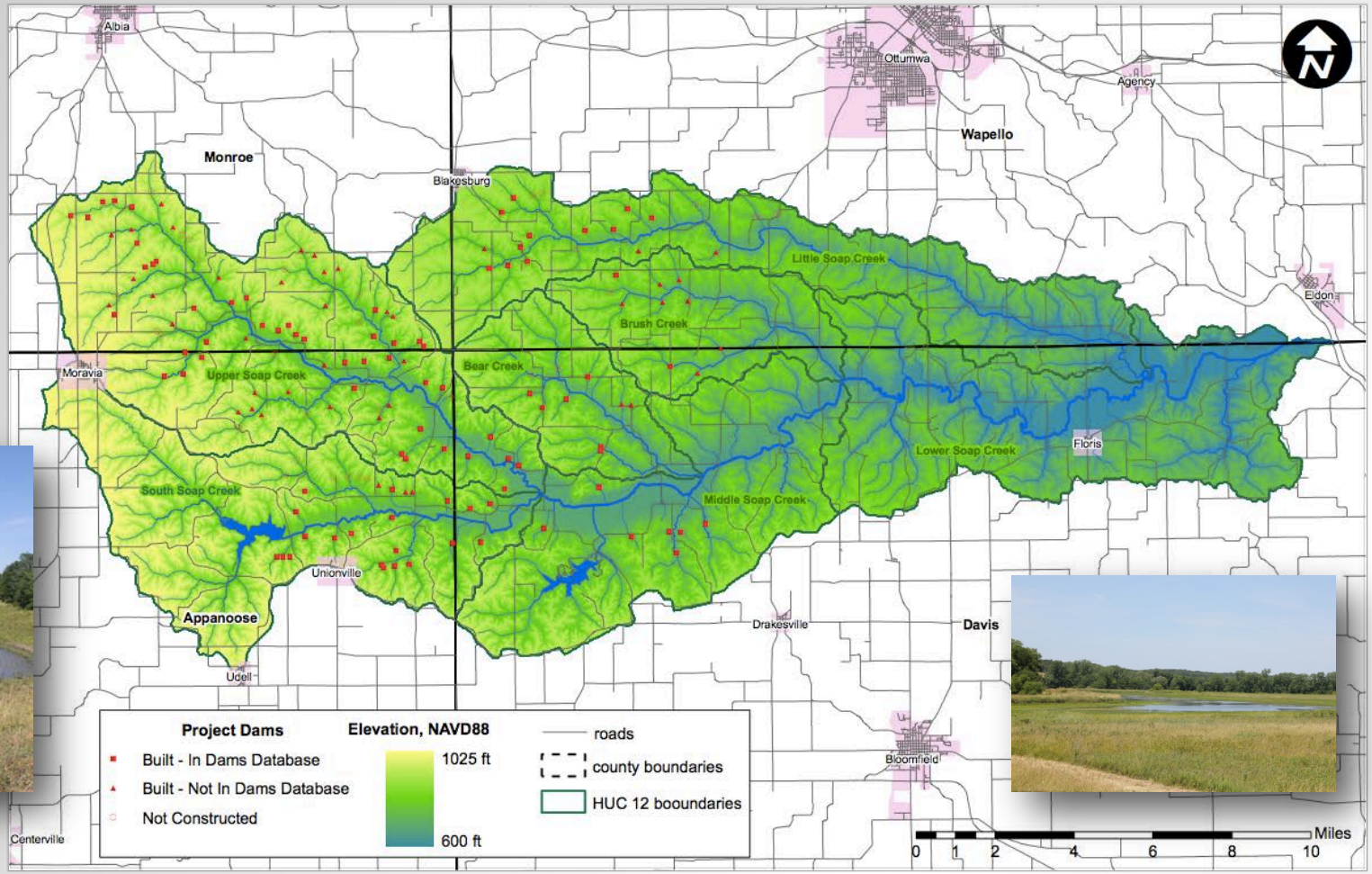
- Watershed Management Authority
- Water quality data collection & GIS analysis
- IDALS-DCS Watershed Projects

Iowa Watershed Projects

Deliverables

- Engagement with IIHR and IFC
- Hydrologic Assessment Report
  - Assessment of current and historical conditions
  - Assessment of future scenarios

Watershed Project Example



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