

# The Iowa Watershed Approach

Iowa Water Center

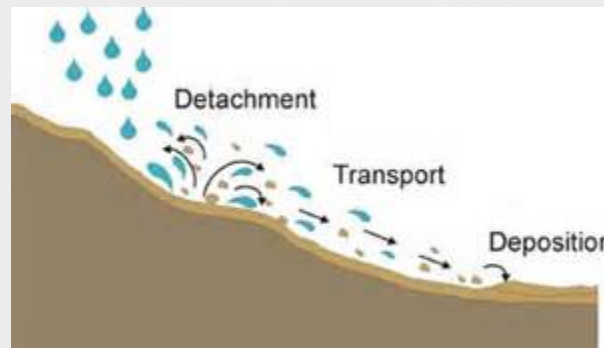
ISU Extension and Outreach

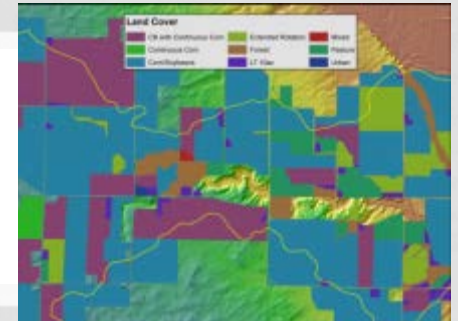
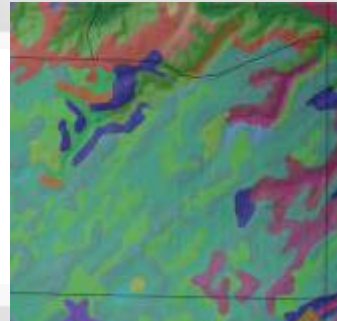
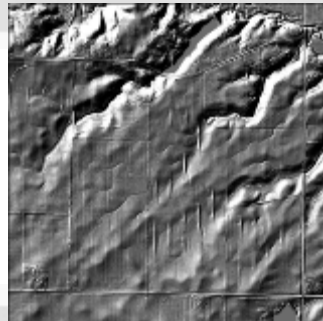
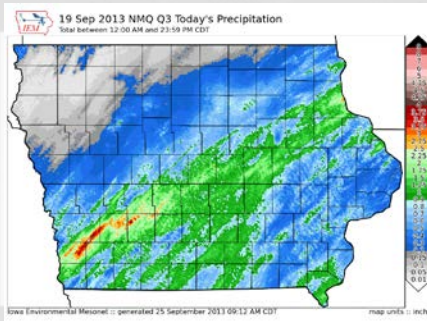
Iowa Nutrient Research Center



# DAILY EROSION PROJECT

- Estimate daily mass of soil transported from hillslopes across Iowa and sections of other selected Midwestern states
- Report these soil erosion values daily and publicly at the HUC 12 spatial resolution.





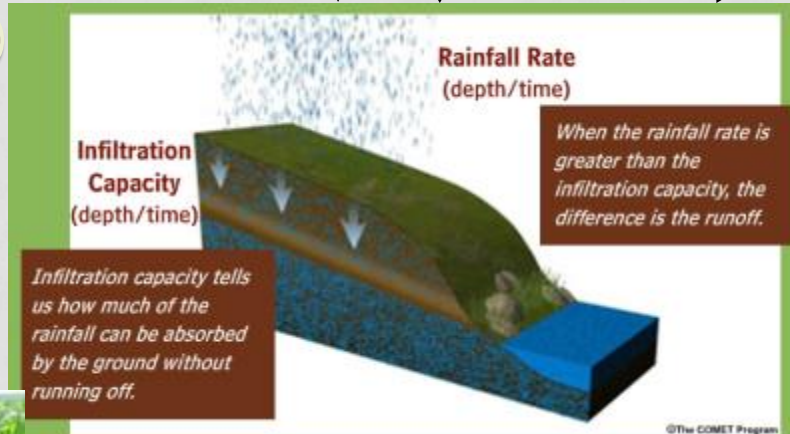
NEXRAD  
Precip

LiDAR  
Elevation

gSSURGO  
Soils

Field-scale  
Land-use &  
Management

# WEPP



## DEP Database

- 1,647 HUC12 watersheds
- 36,900,000+ Acres

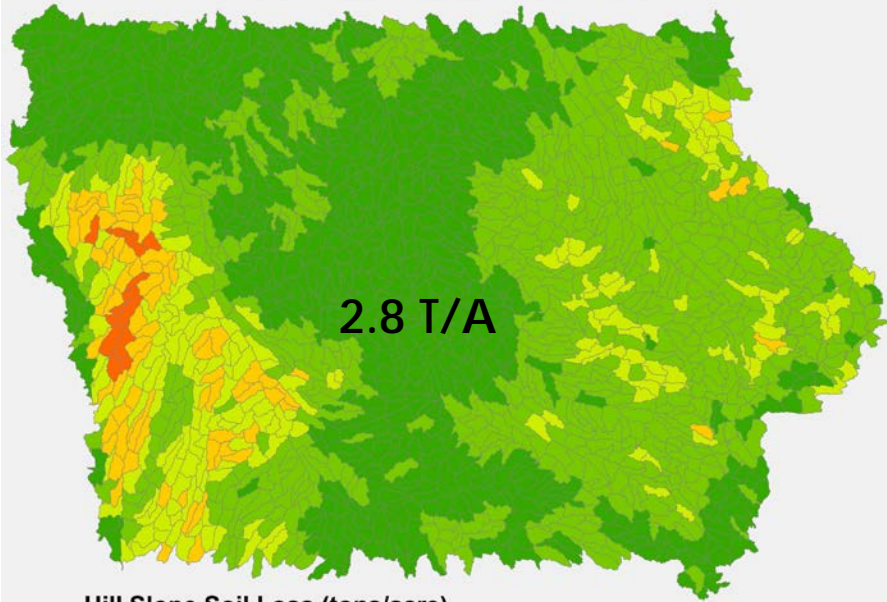
## Major Geo-Spatial Components by HUC12

- Soils - gSSURGO – 10m raster
- Land Use - 2008-2013 NASS Crop Data Layer
- Elevation - LiDAR-based, 2m resolution
- 2009 crop-specific field boundaries



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2007 Hill Slope Soil Loss

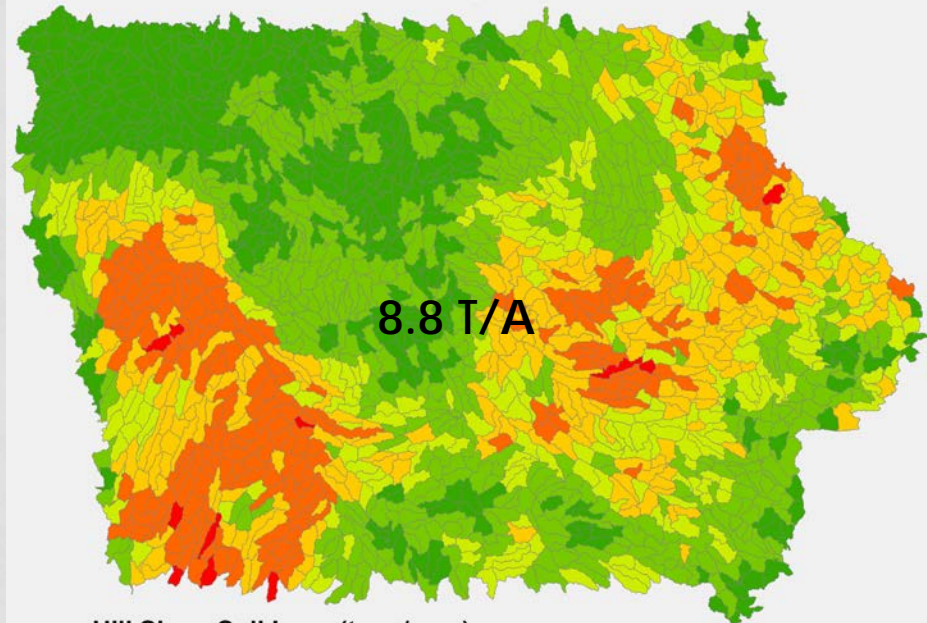


2.8 T/A

Hill Slope Soil Loss (tons/acre)

0 to 1 1 to 5 5 to 10 10 to 20 20 to 50 > 50

2008 Hill Slope Soil Loss

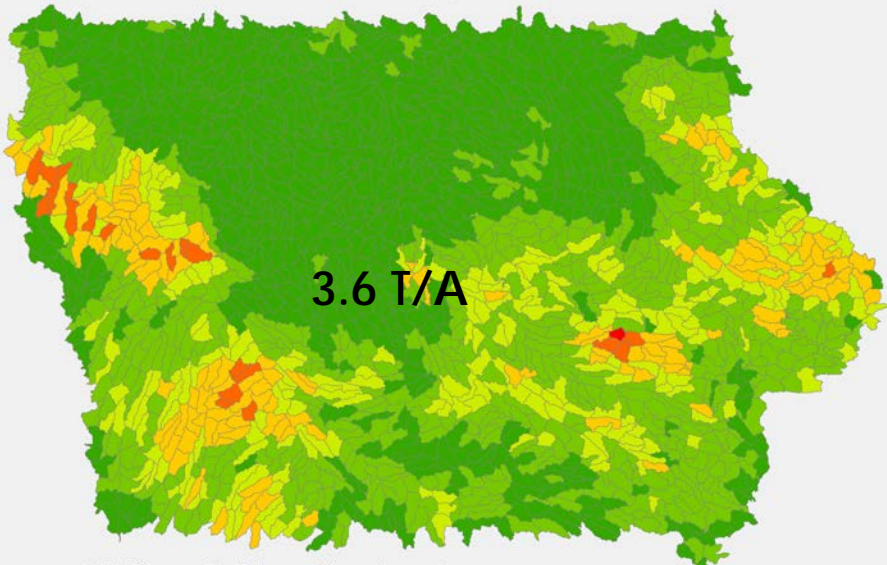


8.8 T/A

Hill Slope Soil Loss (tons/acre)

0 to 1 1 to 5 5 to 10 10 to 20 20 to 50 > 50

2009 Hill Slope Soil Loss

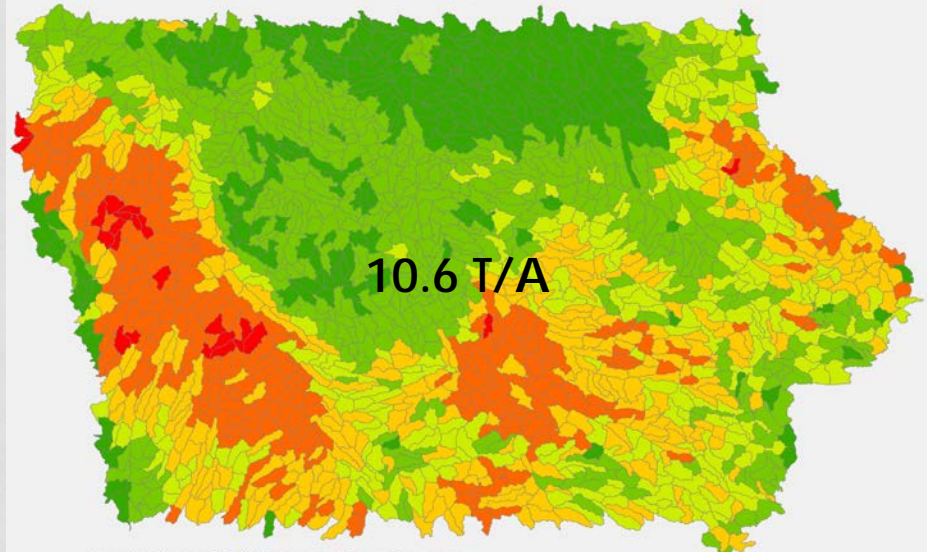


3.6 T/A

Hill Slope Soil Loss (tons/acre)

0 to 1 1 to 5 5 to 10 10 to 20 20 to 50 > 50

2010 Hill Slope Soil Loss



10.6 T/A

Hill Slope Soil Loss (tons/acre)

0 to 1 1 to 5 5 to 10 10 to 20 20 to 50 > 50

# CLIMATE AND EROSION

- Increasing storm frequency and intensity when soils are most vulnerable
- Elevated soil erosion & water runoff rates unless we
  - Increase perennial vegetation
  - Build soil health



# IWC ROLES (BESIDES DEP)

- Estimating historical loss of soil from HUC 12s and its impact on water retention in the uplands
- Information dissemination via Iowa Water Conference and other IWC channels
- WMAs of Iowa



# Extension and Outreach

- For each watershed project watershed:
  - Develop education and outreach plans with integrated communication plans
  - Develop practice-specific outreach materials

**The Iowa Watershed Approach**  
Reducing Flooding and Advancing Water Quality with Ponds

**What is a pond?**  
A pond is a body of water that can be constructed using either an earthen or concrete pond or a grassed waterway. The earthen and concrete ponds are typically constructed and are at least 10 feet deep. The grassed waterway is a shallow channel that is 10 to 20 feet wide and 2 to 4 feet deep. Ponds can reduce phosphorus loads by 80% to 90% and sediment loads by 50% to 75%. They also provide a habitat for wildlife and can be used for recreation.

**Ponds and Flood Reduction**

**THEIR IMPACT:**

1. Reduce sediment erosion
2. Reduce peak water flow rate and volume
3. Provide a habitat for fish

**Ponds and Water Quality**

**THEIR IMPACT:**

1. Remove phosphorus and sediment
2. Reduce sediment erosion
3. Reduce peak water flow rate and volume

**85% P**

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**The Iowa Watershed Approach**  
Reducing Flooding and Advancing Water Quality with Water and Sediment Control Basins

**What are water and sediment control basins?**  
Water and sediment control basins (WSCBs) are an advanced water control structure in a field or pasture. They are designed to capture sediment and phosphorus from runoff before it enters a water body. WSCBs are typically constructed with a concrete or masonry wall and a grassed waterway. They can reduce sediment loads by 80% to 90% and phosphorus loads by 50% to 75%. They also provide a habitat for wildlife and can be used for recreation.

**Water and Sediment Control Basins and Flood Reduction**

**THEIR IMPACT:**

1. Reduce sediment erosion
2. Reduce peak water flow rate and volume
3. Provide a habitat for fish

**Water and Sediment Control Basins and Water Quality**

**THEIR IMPACT:**

1. Remove phosphorus and sediment
2. Reduce sediment erosion
3. Reduce peak water flow rate and volume

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**Applying Woodchip Bioreactors**  
for Improved Water Quality

**What is a woodchip bioreactor?**  
A woodchip bioreactor is a structure that is used to improve water quality in a stream or river. It is constructed from a concrete or masonry wall and a grassed waterway. It contains a layer of woodchips that are used to filter out sediment and phosphorus from runoff before it enters the water body. Woodchip bioreactors can reduce sediment loads by 80% to 90% and phosphorus loads by 50% to 75%. They also provide a habitat for wildlife and can be used for recreation.

**WOODCHIP BIOREACTOR**

**BENEFITS OF A WOODCHIP BIOREACTOR:**

1. Reduces sediment erosion
2. Reduces peak water flow rate and volume
3. Provides a habitat for fish

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# Extension and Outreach

- Develop training opportunities for the IWA coordinators at the Iowa Watershed Academy
- Coordinate field days, workshops, and outreach events with project partners



# Extension and Outreach

- Collaborate with ISU Research Farms and Extension Specialists to link IWA projects with new or existing on-farm demonstrations projects
- Establish data collection protocols for practice evaluation



# Iowa Nutrient Research Center

- Incorporate research findings into project messaging strategies
- Collaborate with INRC project PIs to develop additional outreach materials

# Iowa Nutrient Research Center IWA Projects

- Monetizing the Benefits of Conservation Practices Based on the Iowa Watershed Approach
- Scenario Development to Achieve Iowa Nutrient Reduction Strategy Goals
- Hydrometeorological Impacts on Water Quantity and Quality across Iowa's Streams
- The Impact of Climate Variability and Land Management Practices on Water Quality in Iowa at the Watershed Scale.

# Project Assessments and Evaluation

- Create field day and event evaluations for all projects to utilize
- Conduct mid-project assessments with each watershed project
- Conduct an end of project evaluation