A vision for a more resilient Iowa

The Iowa Watershed Approach

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Previous Meeting

- IWA Program Timeline
- Hydrologic Assessment
  - Hydrologic Model Development Review
  - Hydrologic Model Updates
  - Radar Rainfall Estimate Inputs to Model
  - Initial Hydrologic Model Results
- Sensor Deployment
- Survey
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The Iowa Watershed Approach

- Watershed breakdown includes:
  - Lake/Reservoir Outlets that Regulate Discharge
  - Known Discharge (or Stage) Measurement Locations
  - Points of Interest

- West Nishnabotna Model:
  - 475 Subbasins Delineated
  - Average of approx. 3.5 square miles

- East Nishnabotna Model:
  - 439 Subbasins Delineated
  - Average of approx. 2.6 square miles

- Stage-storage-discharge relationships for Lake Anita have been incorporated
Calibrated/Validated Hydrologic Model Uses:

- Identification of High Runoff Potential Areas
- Analysis of Flood Mitigation Strategies
  - Increasing Infiltration
  - Distributed Storage
BMPs are being collected by 12-digit HUC and finished products can be downloaded at: [https://athene.gis.iastate.edu/consprac/consprac.html](https://athene.gis.iastate.edu/consprac/consprac.html)
Agricultural Conservation Planning Framework: Staff Creek Watershed

Conservation Practices:
- Drainage Water Management
- Grassed Waterways
- Buffer Strips
- Water and Sediment Control Basins (WASCOBs)
- Nutrient Removal Wetlands
- Saturated Buffers

Further Information:
http://northcentralwater.org/acpf/
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Hydrologic Sensor Network

- Rainfall
- Wind speed and direction
- Soil moisture and temperature
- Shallow ground water

Vaisala WTX531
Vaisala WTX533
Campbell Scientific CS655
Hydrologic Sensor Deployment
Survey Highlights

Survey responses in general were quite positive about the progress being made toward forming a WMA. In particular, respondents agreed that:

1.) The watershed has the necessary resources to form the WMA
2.) The meetings are providing a good basis for building a partnership
3.) Forming a WMA will help in the process of improving water quality and mitigating flood damage
IWA Program Timeline
Iowa Flood Center
The University of Iowa
100 C. Maxwell Stanley Hydraulics Laboratory
Iowa City, IA 52242

319-384-1729
www.iowafloodcenter.org
Iowa Water Center
at Iowa State University

Education & outreach on water issues
Research support at Iowa colleges
The Daily Erosion Project
DAILY EROSION PROJECT

RICK CRUSE - IOWA WATER CENTER & ISU

515-294-7850
Equivalent days of flow for water holding capacity lost after 10 years

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SOIL CONSERVATION

- Improves or maintains productivity
- Supports favorable water quality
- Reduces flood crest height for selected flooding events
- PAYS!
NEXRAD Precipitation

LiDAR Elevation

gSSURGO Soils

Field-scale Land-use & Management

WEPP

Infiltration Capacity
(depth/time)

Rainfall Rate
(depth/time)

Infiltration capacity tells us how much of the rainfall can be absorbed by the ground without running off.

When the rainfall rate is greater than the infiltration capacity, the difference is the runoff.
DEP Database

- 1,647 HUC 12 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
• LiDAR-derived elevation models can better predict water flow across the landscape but...
  • Doesn’t always flow
    • Roads/field entries/railroads create digital dams
• Hydrologic enforcement cuts across impediments to allow fully flowing hydrologic regime
  • Does not force flow from true depressions...’Prairie Potholes’
CLIMATE AND EROSION

- Increasing storm frequency and intensity when soils are most vulnerable
- Elevated soil erosion & water runoff rates unless
  -
  -
  -
Catchments, Channels, & Flowpaths