Out with the Old, In with the New:

Implementing the Results of the Iowa Rapid Floodplain Modeling Project

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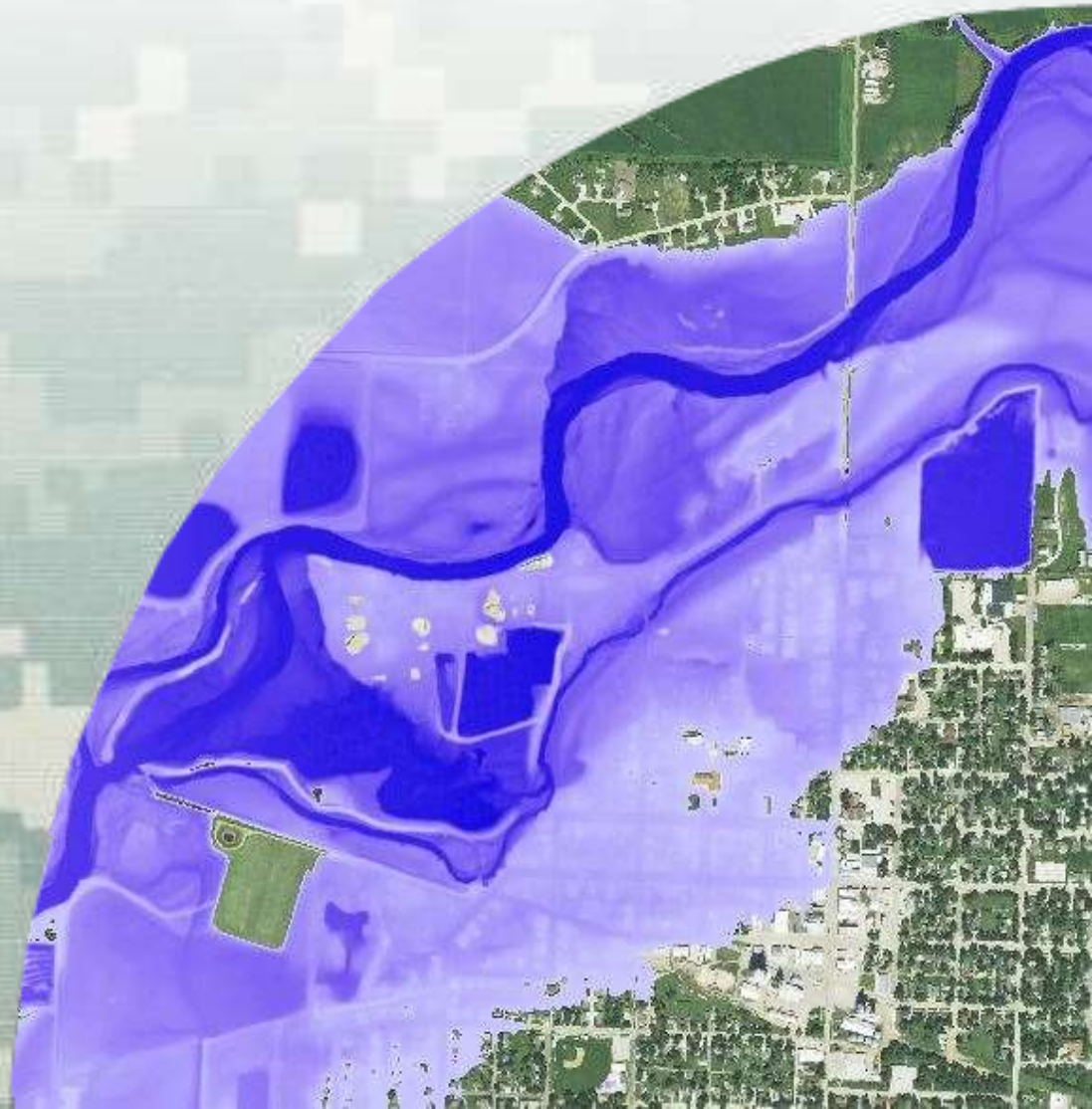
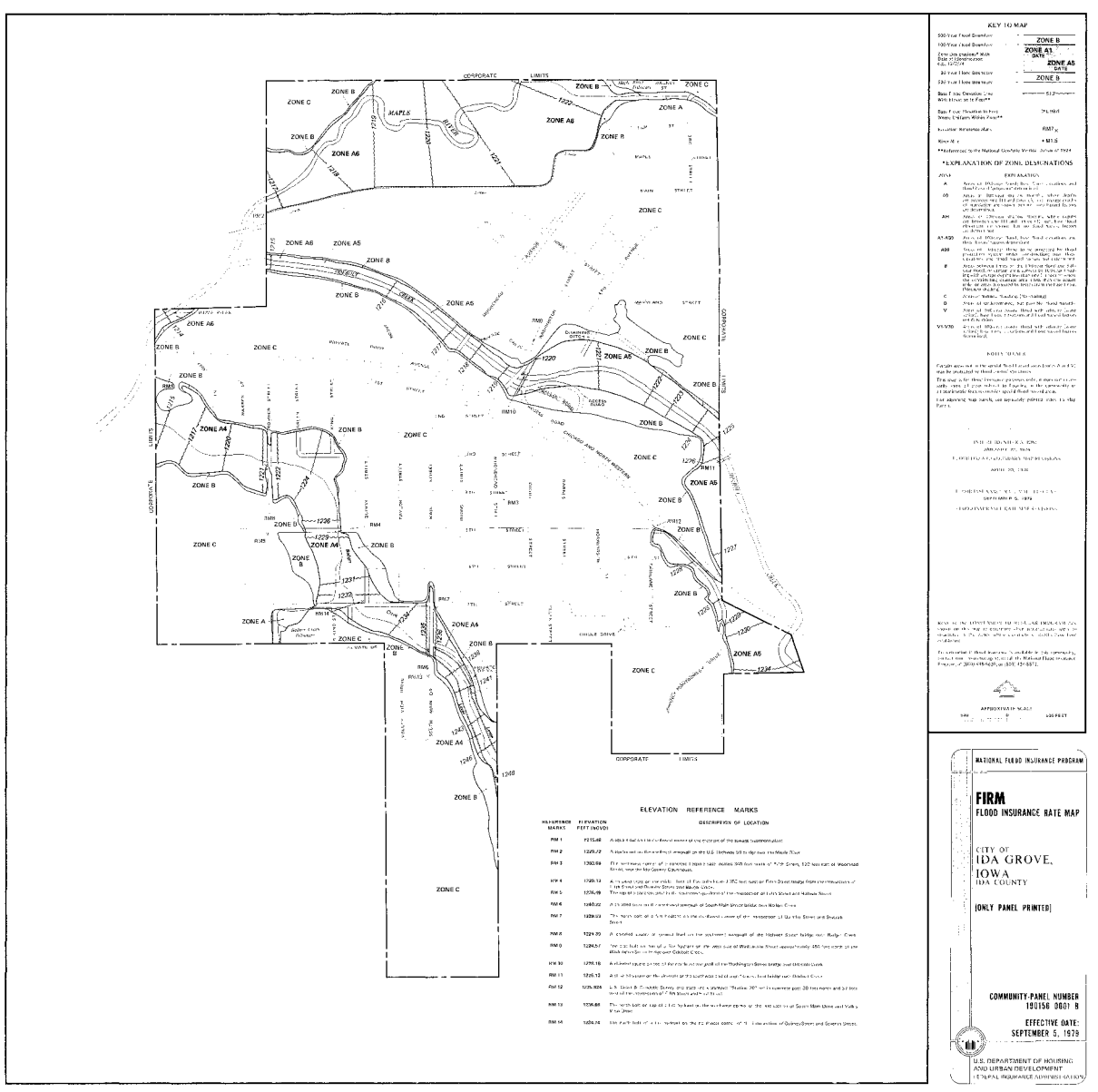


US Army Corps of Engineers
BUILDING STRONG®

Mitigation = Risk Informed Decisions



A Need for New/Updated Mapping

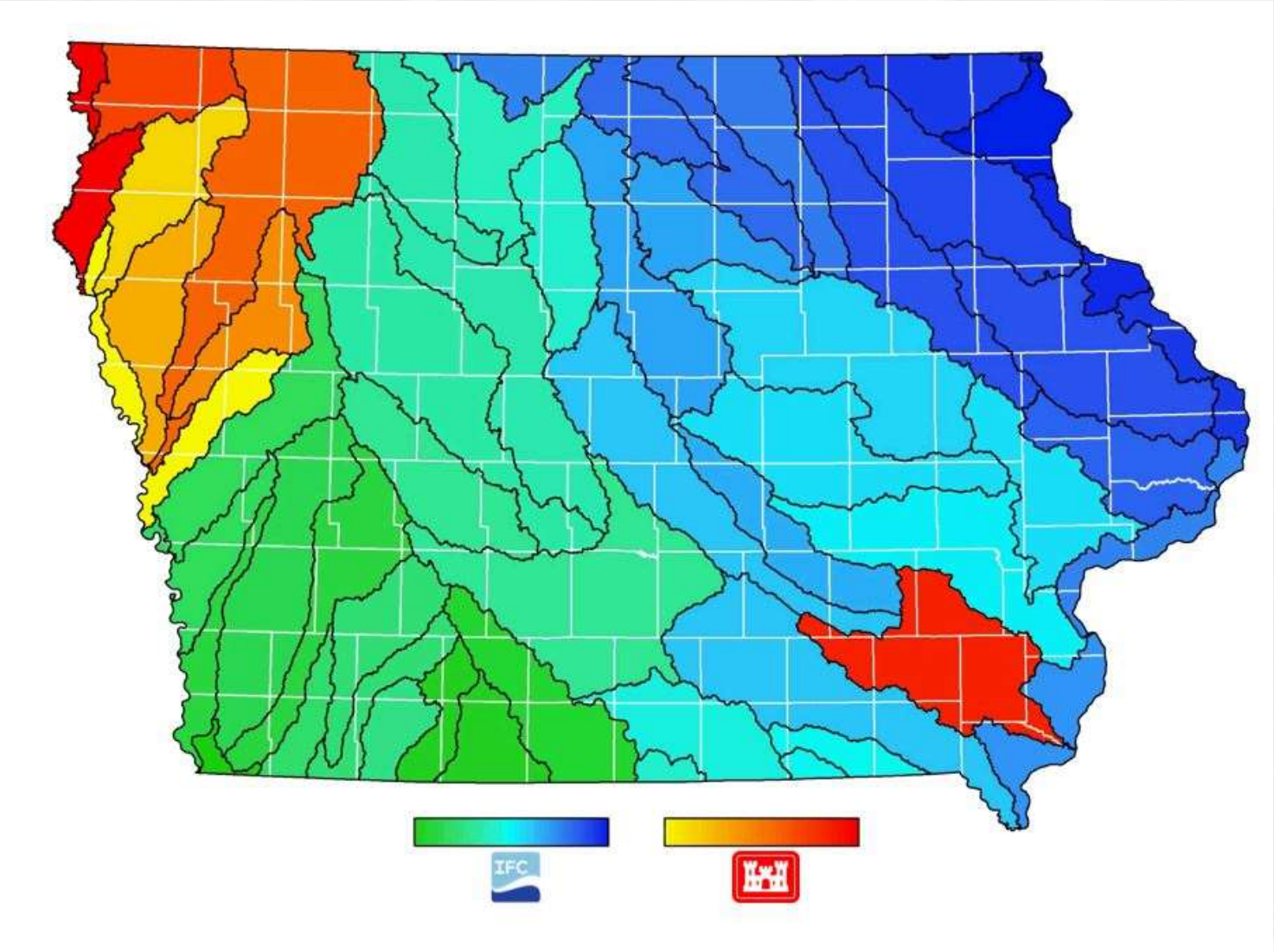
- The Omaha District/IFC developed automated scripts that:
  - Sets up the HEC-RAS (Hydraulic Model) data
  - Manages the data (such as the flow and geometry data)
  - QA/QC tool – So 100% manual review is not needed

- Iowa Floodplain Mapping Project
  - USACE Section 22 for 8 HUC8 Watersheds
  - 55 HUC8 Watersheds total
  - Goal is to develop data applicable for a Zone A approximate study to be incorporated into the NFIP

- Through the application of statewide LiDAR data and GIS automation tools, HEC-RAS models are used to develop this data.

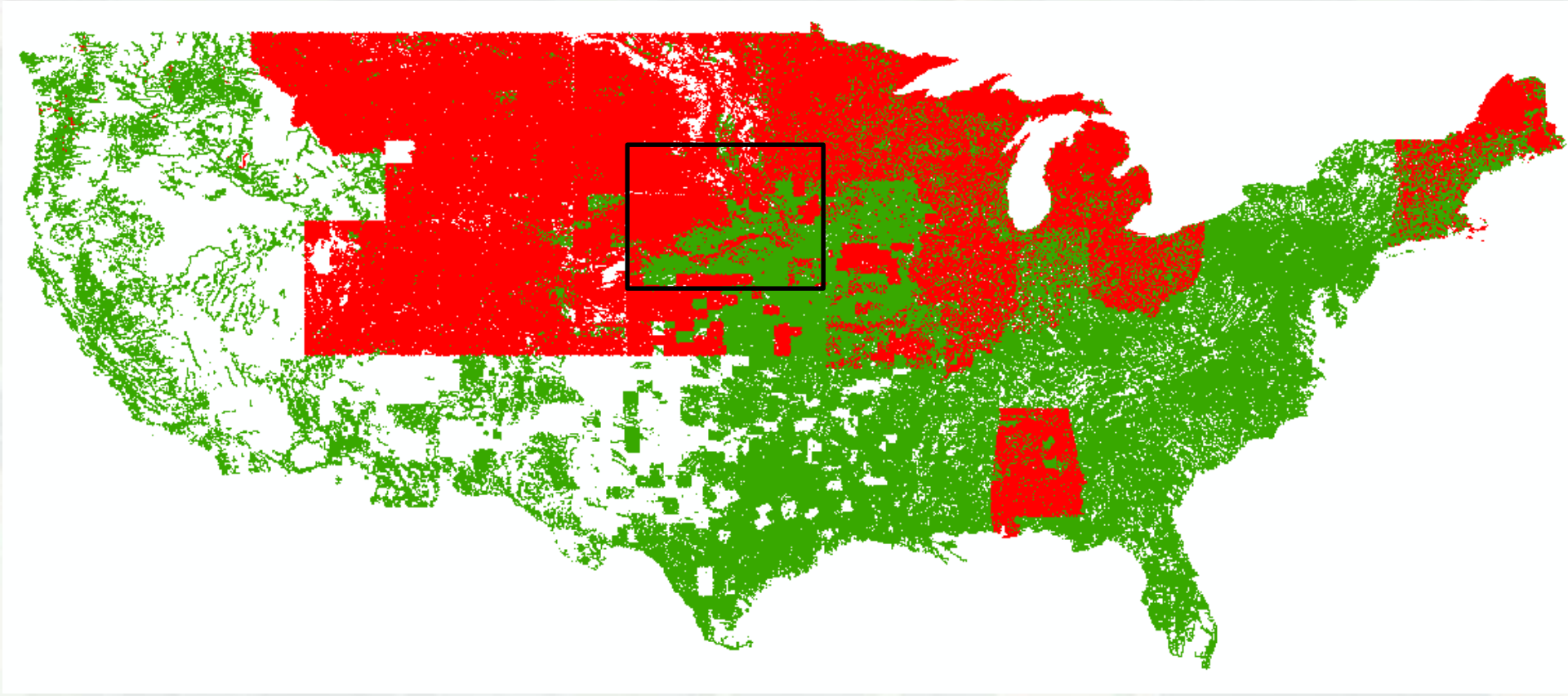
- Automated methods have been developed to assist hydraulic modelers in verifying that engineering products meet specific requirements.

Study Area



Coordinated Needs Management System (CNMS)

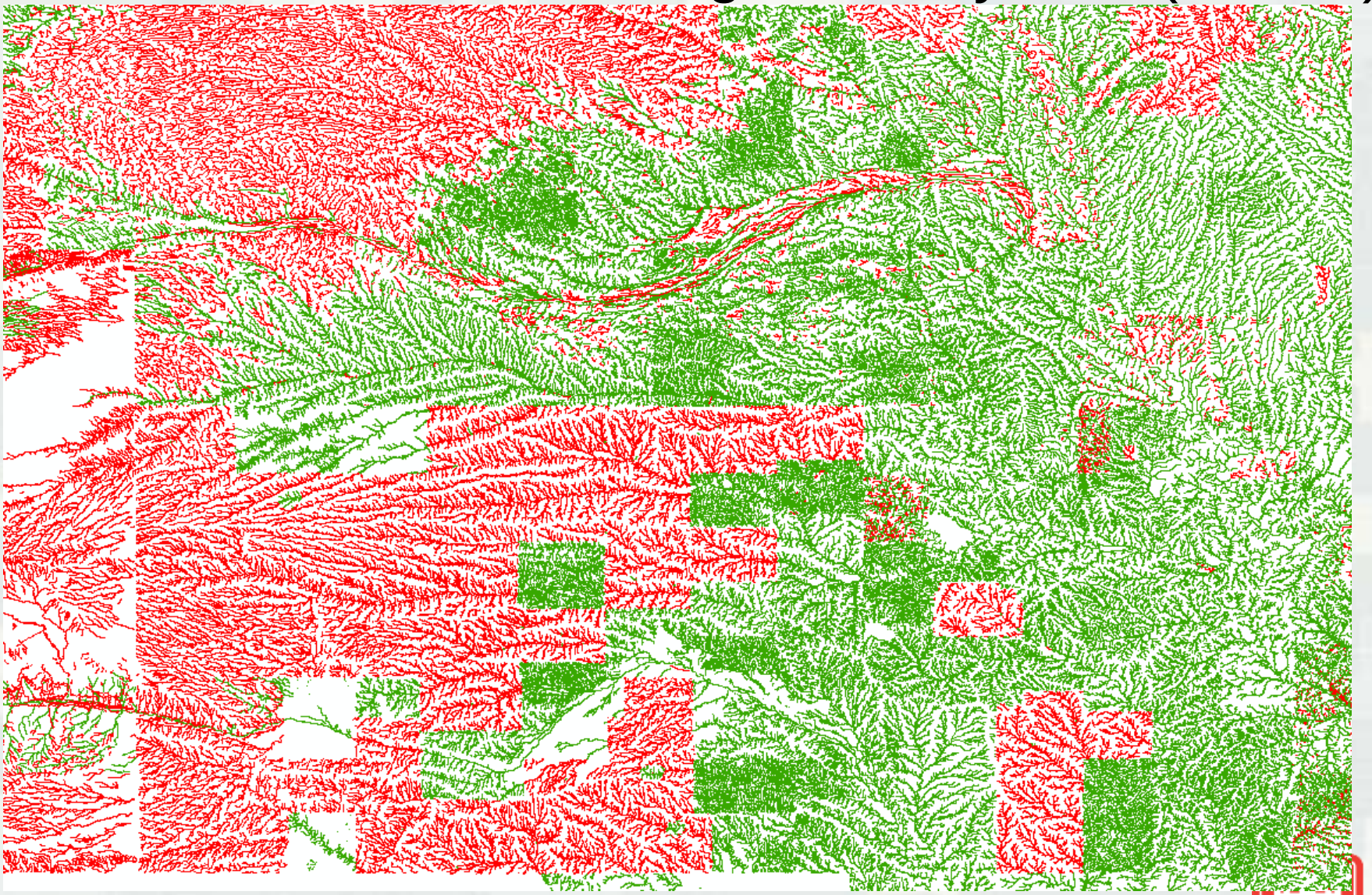
A FEMA initiative to update the way FEMA organizes, stores, and analyzes flood hazard mapping information for communities.



— Studied Stream Lines

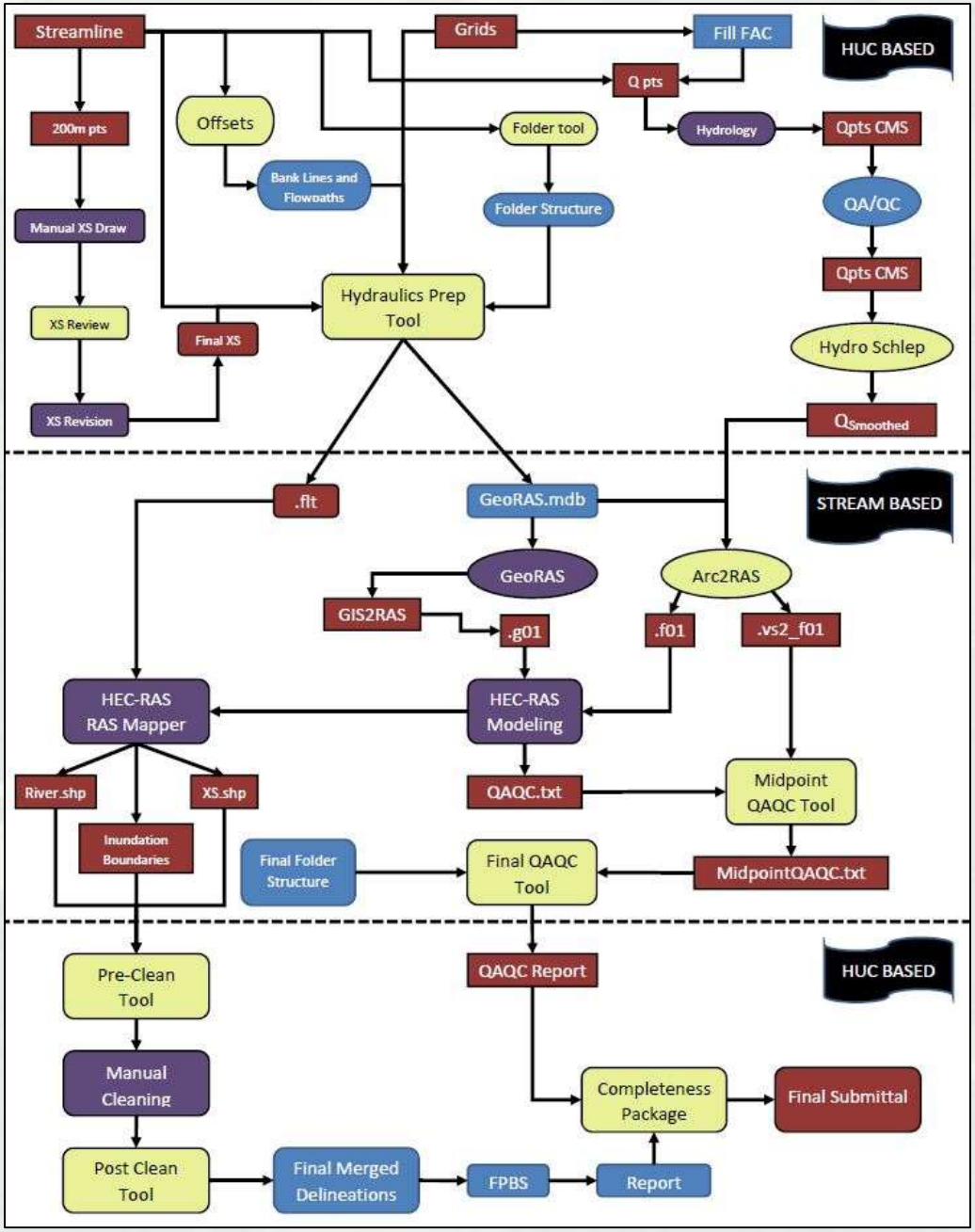
— Unmapped Stream Lines

Coordinated Needs Management System (CNMS)

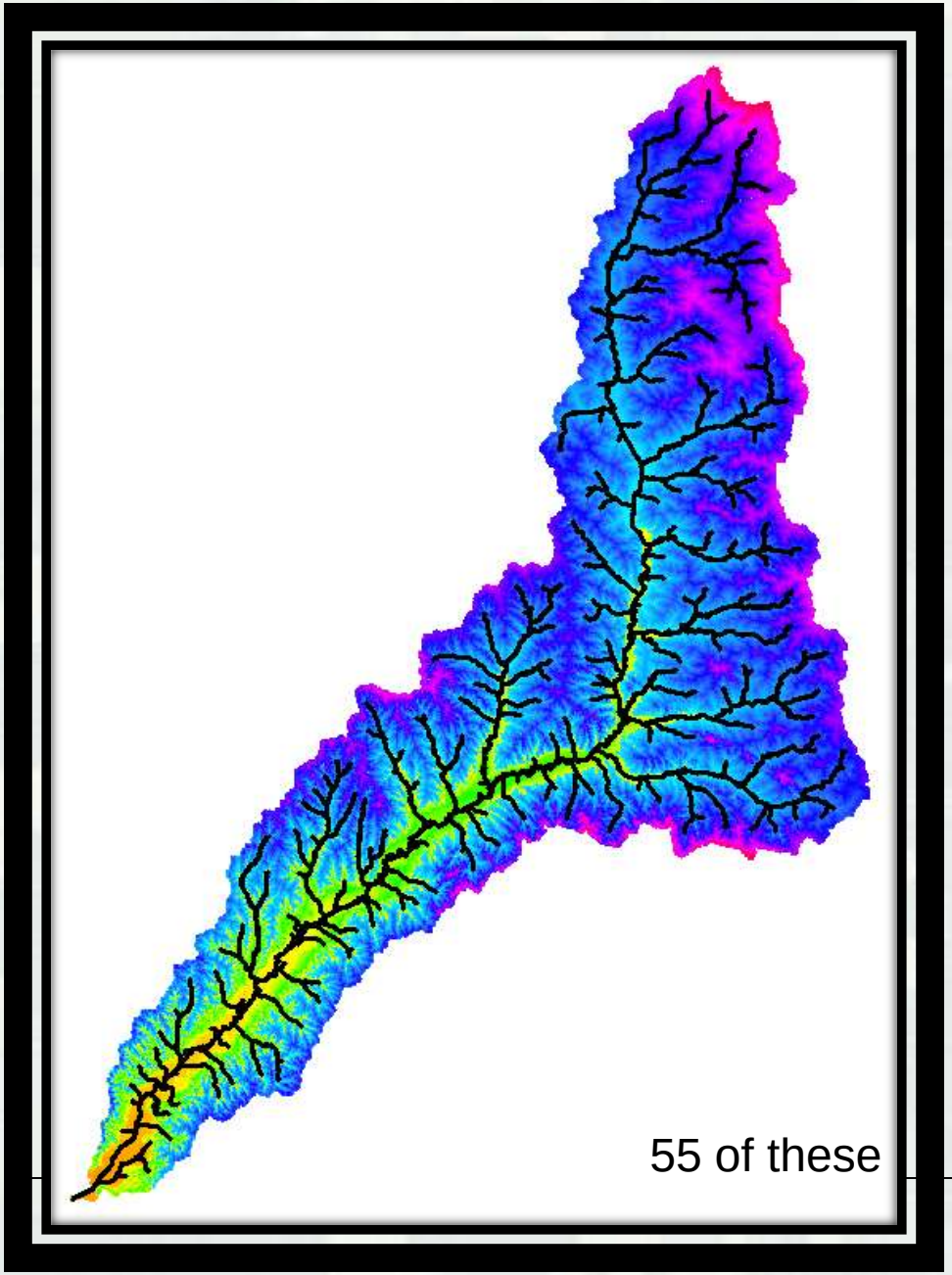


Unmapped Stream Lines

Studied Stream Lines


Streamline
Grids
Fill FAC
HUC BASED
Q pts
200m pts
Offsets
Folder tool
Hydrology
Qpts CMS
Bank Lines and Flowpaths
Folder Structure
QA/QC
Manual XS Draw
Qpts CMS
XS Review
Final XS
Hydraulics Prep Tool
Hydro Schlep
XS Revision
$Q_{Smoothed}$
.flt
GeoRAS.mdb
STREAM BASED
GeoRAS
Arc2RAS
GIS2RAS
.g01
.f01
.vs2_f01
HEC-RAS RAS Mapper
HEC-RAS Modeling
River.shp
XS.shp
QAQC.txt
Midpoint QAQC Tool
Inundation Boundaries
Final Folder Structure
Final QAQC Tool
MidpointQAQC.txt
Pre-Clean Tool
QAQC Report
HUC BASED
Manual Cleaning
Completeness Package
Final Submittal
Post Clean Tool
Final Merged Delineations
FPBS
Report

Large Data Set – Entire Watershed/HUC



55 of these

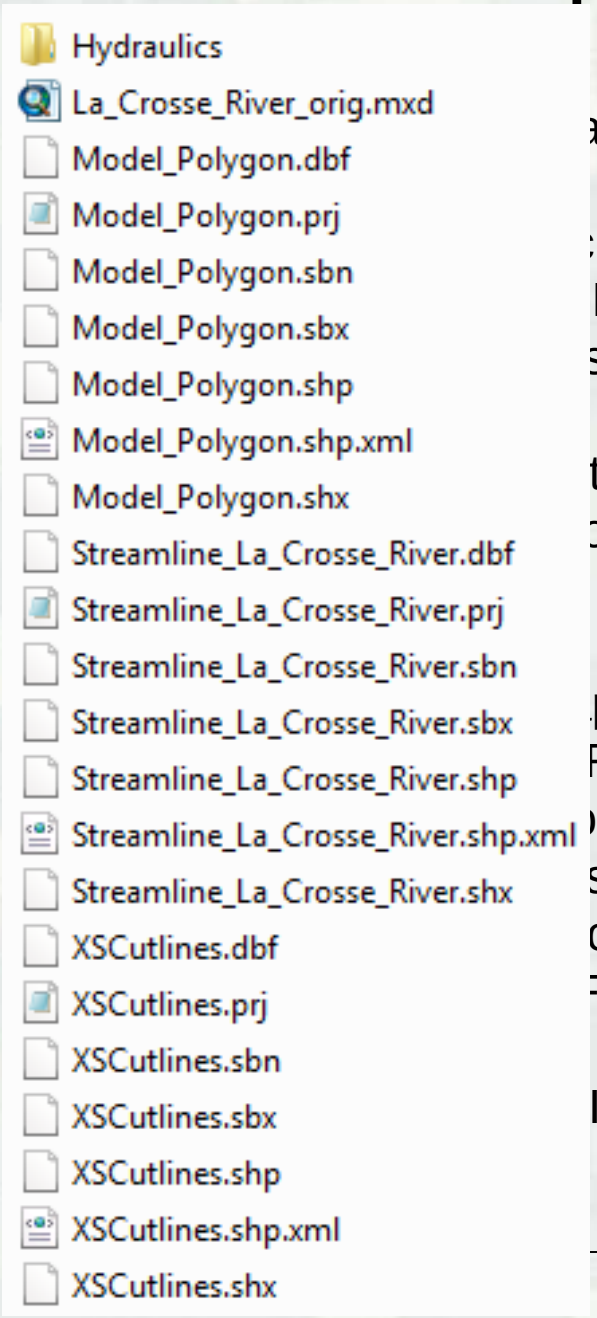
13,000 of these

100,000+ stream miles

Python Scripts

#1

#2



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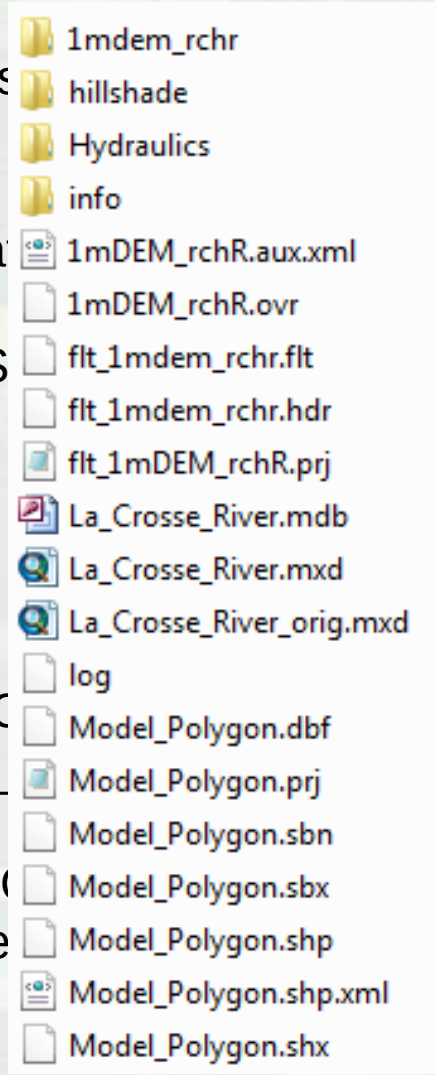
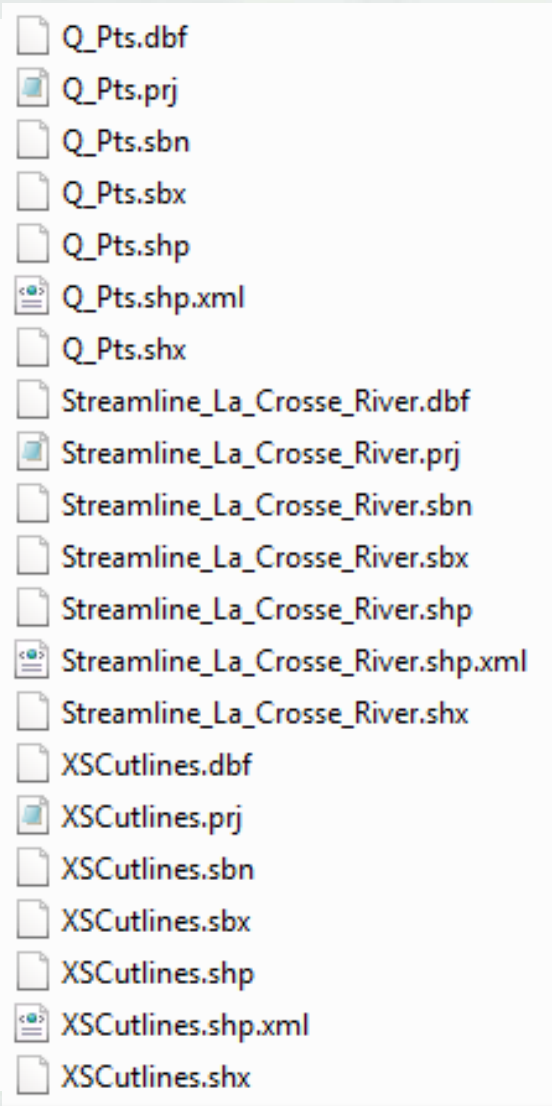
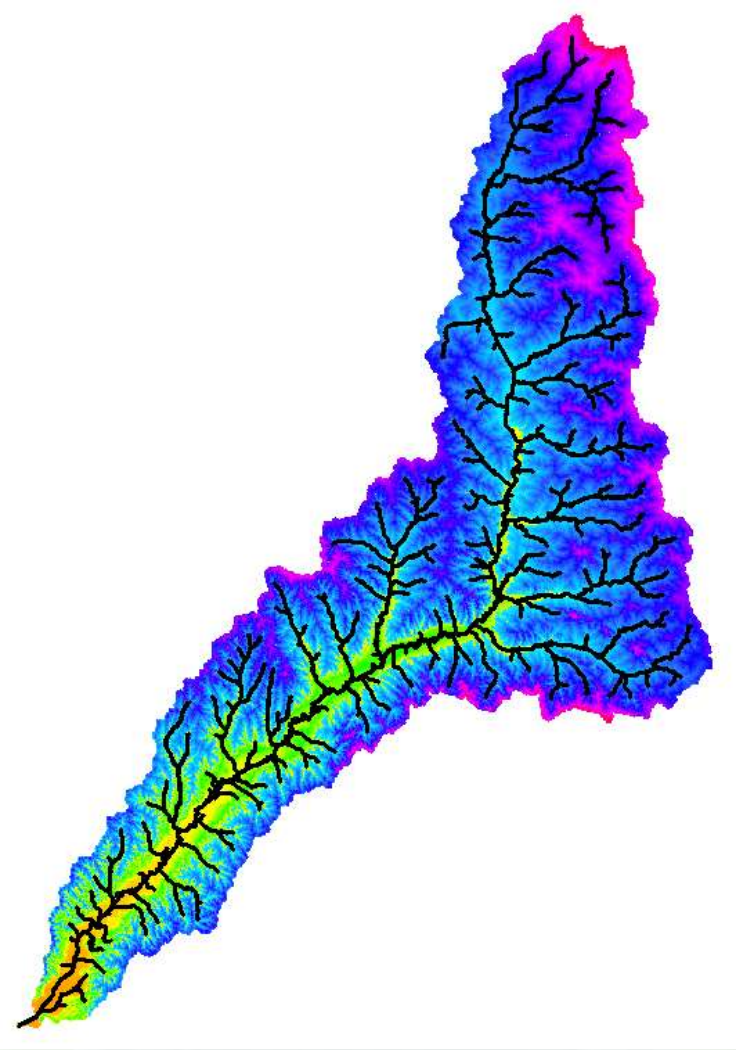
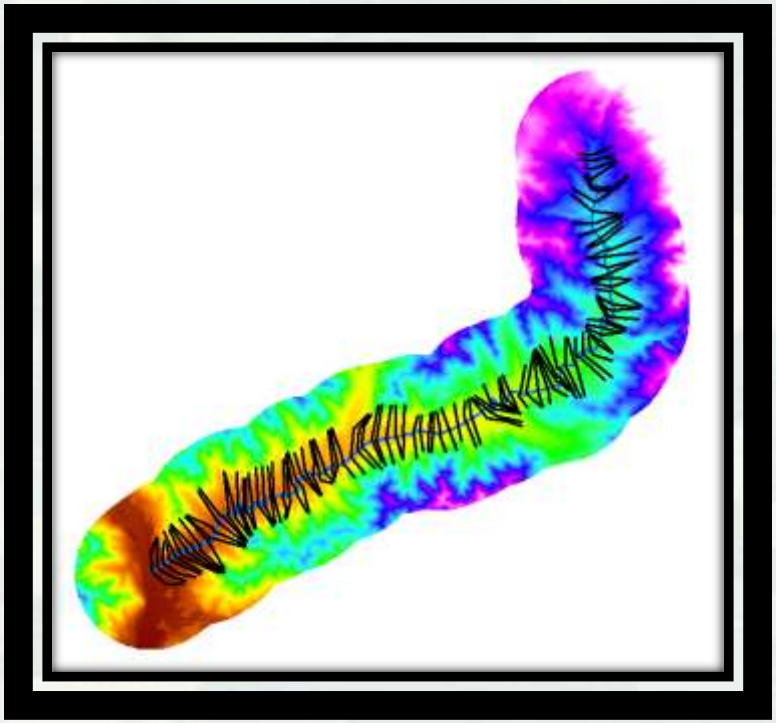


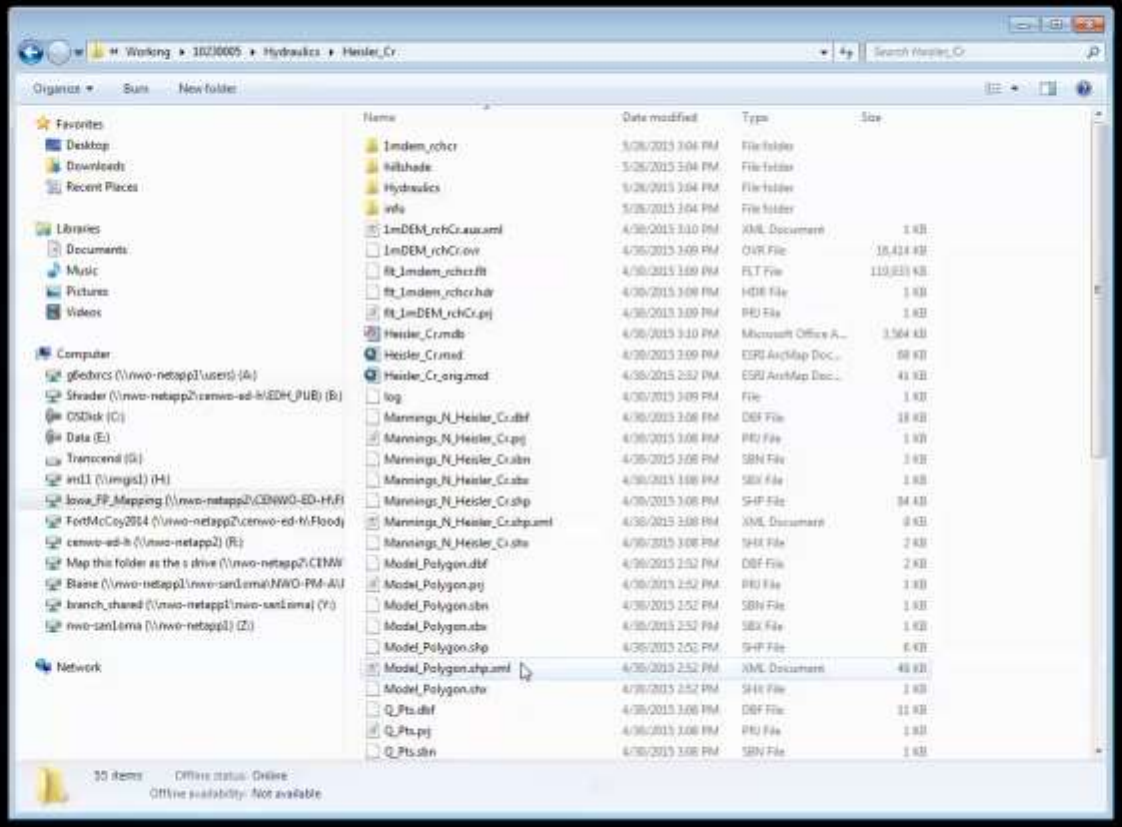


Individual Stream





Heisler Creek Example Video



QA/QC

No real criteria for Zone A mapping

USACE – Omaha District QA/QC automated tool checks:

- Completeness Review:
  - Is the project title correct?
  - Is there only one plan, geometry and flow file?
  - Are the plan, geometry, flow titles correct?
- Geometry Review:
  - Model units
  - Are the reach lengths correct?
  - Is the cross section stationing in line with the reach lengths?
  - Are the cross sections long enough to include the flooded areas?
  - Are the overbank Manning's values correct?
  - Are the channel Manning's values correct?
- Flow Review:
  - Does the model contain each profile
  - Are the discharges for each profile correct?
  - Do the flows increase in the downstream direction?
  - Is the slope acceptable for boundary conditions-normal depth?
- Results Review:
  - Do any of the profiles cross or contain dips?

Hydraulics Completion

- USACE Omaha District Completed Modeling for 8 HUC8 Watersheds
  - 2,000 individual streams
  - Calibrations and Re-Delineations on detailed study (FEMA Mapped Zone AE) areas

Project Stages

- Hydrology and Hydraulics Done
- Re-Delineations Incorporated (if any)
- New Studies Incorporated (if any)
- FPM Manual Cleanup/Review

Stage One:
Initial Mapping Complete

- Phone Kick-off Meeting with officials/stakeholders
- DFHP Meeting with officials/stakeholders
- Distribute Products (Shapefiles, Depth Grids, Models, CSLF) to stakeholders
- Deliver data on www.Iowafloodmaps.org website
- Elicit Feedback from officials/stakeholders

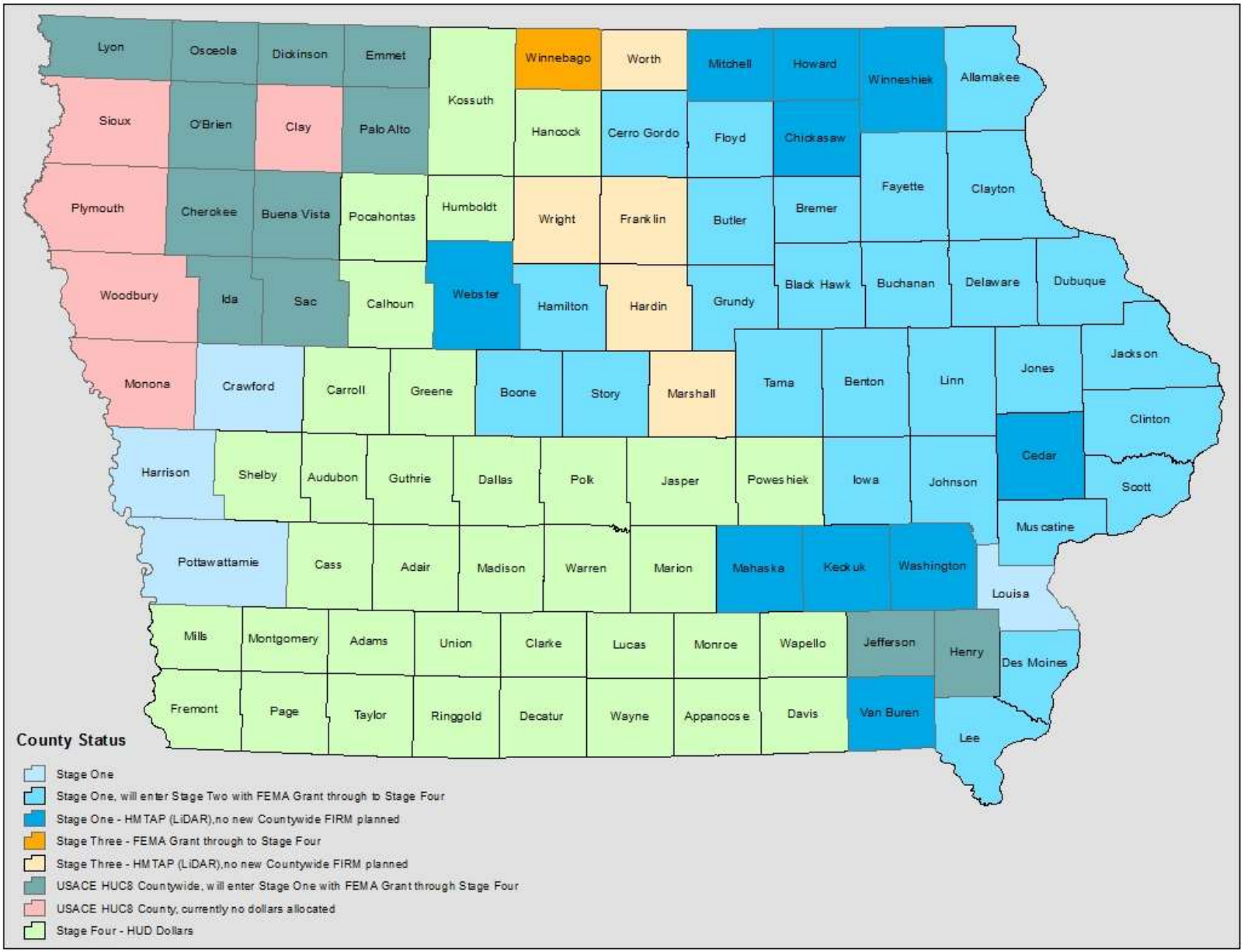
Stage Two:
Draft FPM Products Delivered
(Public Official Ready)

- Incorporate new development since LiDAR
- Incorporate new information from community
- Review to assess impact of new information
- Follow up with officials regarding results
- Incorporate changes into FPM/Hydraulic Submittals if warranted
- Incorporate changes into other products (Depth Grids, CSLF)

Stage Three:
Incorporate Changes to FPM Products
(Public Ready After Complete)

- Base Map preparation (roads, panels, general structures, sub-basins) – **IFC GIS Staff**
- Preliminary Map Preparation before preliminary submittal to FEMA – **DNR Subcontractor**
- Incorporate last minute changes
- Post Preliminary Map Production – **DNR Sub**
- Meetings (Engineering Review/CCO) – **DNR/FEMA/Sub**
- Letter of Final Determination – **DNR/FEMA/Sub**
- COMPLETE!!!

Stage Four:
DFIRM


Lyon
Osceola
Dickinson
Emmet
Kossuth
Winnebago
Worth
Mitchell
Howard
Winneshiek
Allamakee
Sioux
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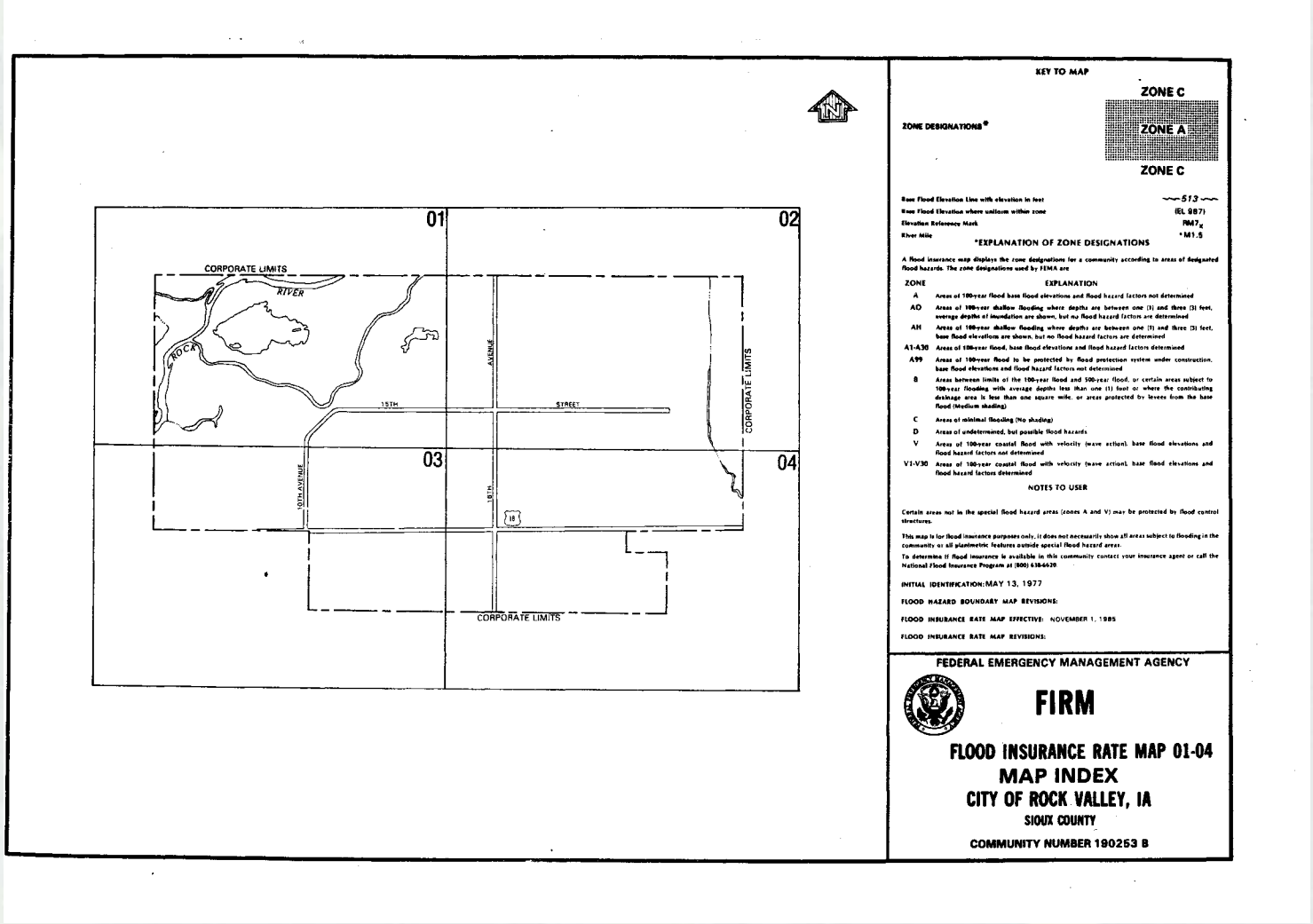
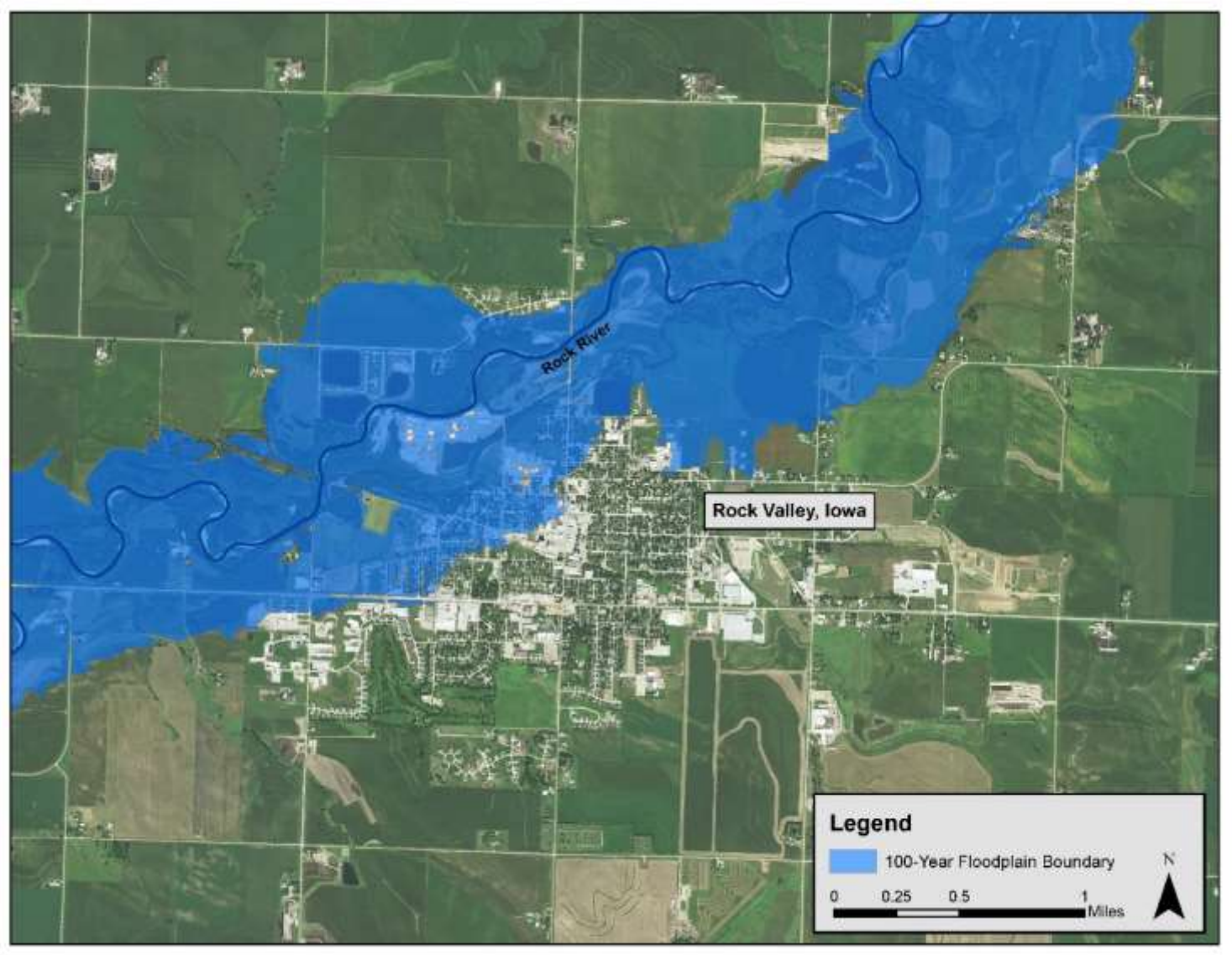
Clay
Palo Alto
Hancock
Cerro Gordo
Floyd
Chickasaw
Fayette
Clayton
Plymouth
Cherokee
Buena Vista
Pocahontas
Humboldt
Wright
Franklin
Butler
Bremer
Woodbury
Ida
Sac
Calhoun
Webster
Hamilton
Hardin
Grundy
Black Hawk
Buchanan
Delaware
Dubuque
Monona
Crawford
Carroll
Greene
Boone
Story
Marshall
Tama
Benton
Linn
Jones
Jackson
Clinton
Harrison
Shelby
Audubon
Guthrie
Dallas
Polk
Jasper
Poweshiek
Iowa
Johnson
Cedar
Scott
Muscatine
Pottawattamie
Cass
Adair
Madison
Warren
Marion
Mahaska
Keokuk
Washington
Louisa
Mills
Montgomery
Adams
Union
Clarke
Lucas
Monroe
Wapello
Jefferson
Henry
Des Moines
Fremont
Page
Taylor
Ringgold
Decatur
Wayne
Appanoose
Davis
Van Buren
Lee
County Status
Stage One
Stage One, will enter Stage Two with FEMA Grant through to Stage Four
Stage One - HMTAP (LiDAR),no new Countywide FIRM planned
Stage Three - FEMA Grant through to Stage Four
Stage Three - HMTAP (LiDAR),no new Countywide FIRM planned
USACE HUC8 Countywide, will enter Stage One with FEMA Grant through Stage Four
USACE HUC8 County, currently no dollars allocated
Stage Four - HUD Dollars

Rock Valley, Iowa



Non-Regulatory Floodplain Boundaries



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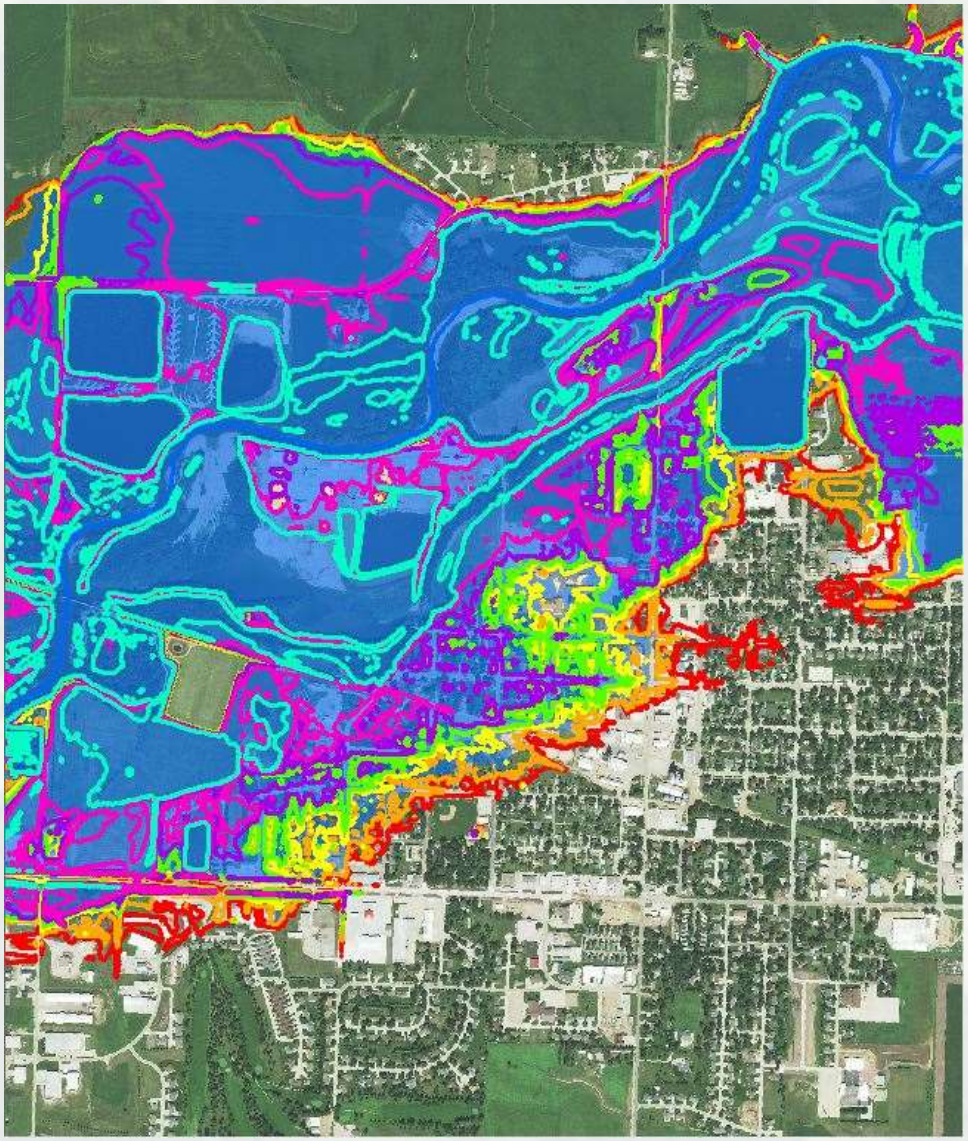
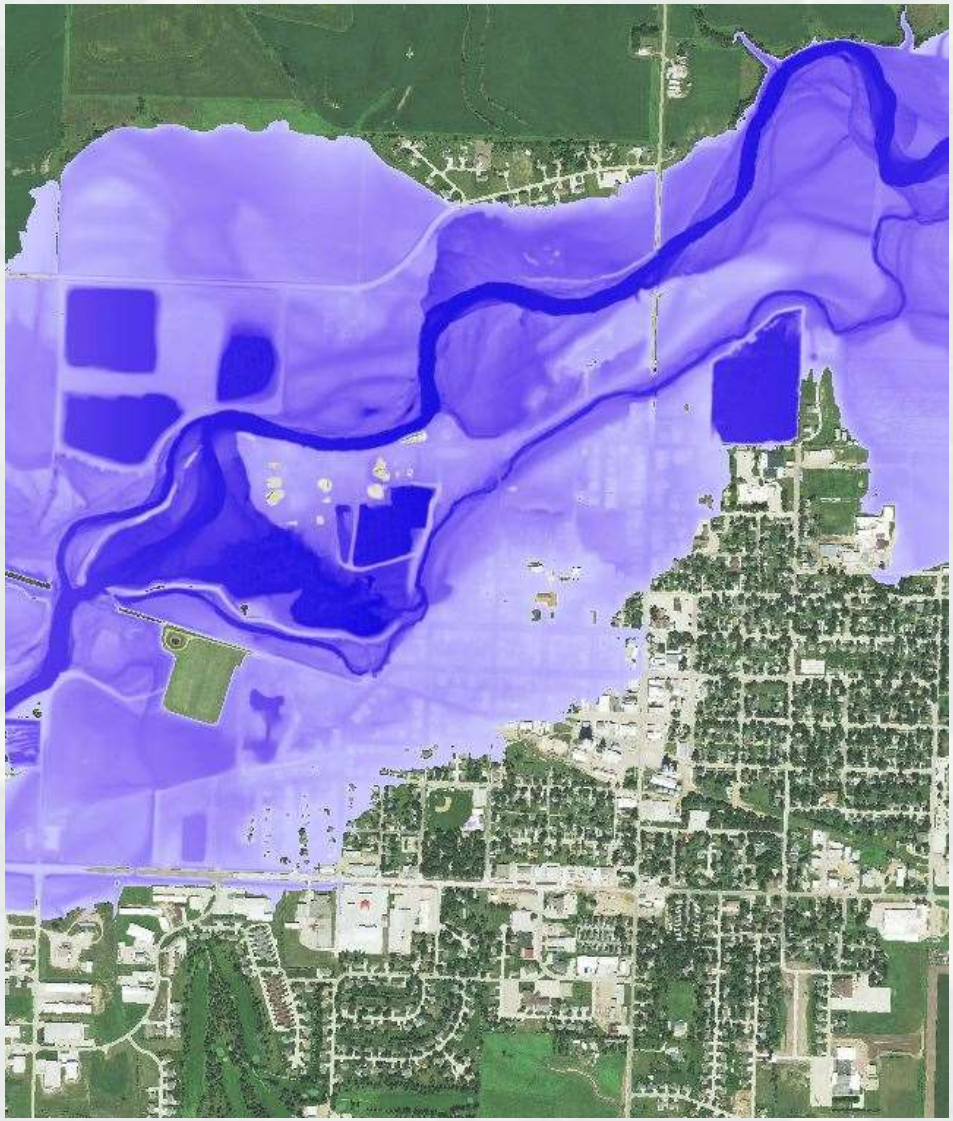
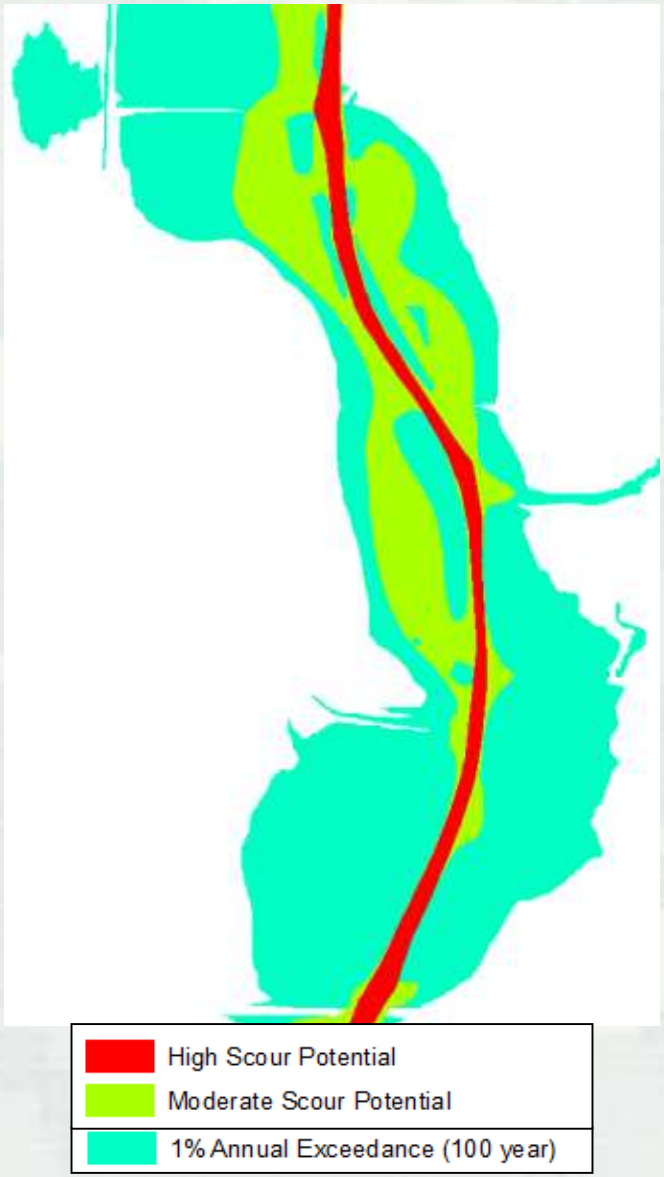


Depth Grids – A Deeper Look at Inundation



Scour Targeting Maps



Continued Mapping Efforts: Post Project

- Some communities currently mapped in detailed study areas (Zone AE) are not being updated through this study
  - Re-delineation models created
  - Current Zone A models and terrain available to update the existing mapped Zone AE Detailed Study areas
    - Need structure survey data
    - Sources available to upgrade current Zone A mapping to Zone AE mapping for communities in need of a detailed study flood zone


Nice!

What Did We Accomplish?

- Successfully updated the existing flood risks within the state of Iowa
  - People have the resources to be aware of their risks
  - More residents located in the 100-year floodplain boundary
    - Newly mapped residents inside the boundary will have to purchase flood insurance per NFIP requirements
    - Is this a good thing?
- How can we help these communities after providing them this information?

How Can We Help?

- Iowa Silver Jackets
- USACE Planning Studies
  - Section 14
  - Section 22
  - Section 205
  - Section 206
  - Section 1135

Questions?

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Iowa Flood Center – Technical Partner
Iowa Department of Natural Resources – Project Sponsor