West Fork Whitewater River Flood Insurance Study

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September 4, 2019

HNTB

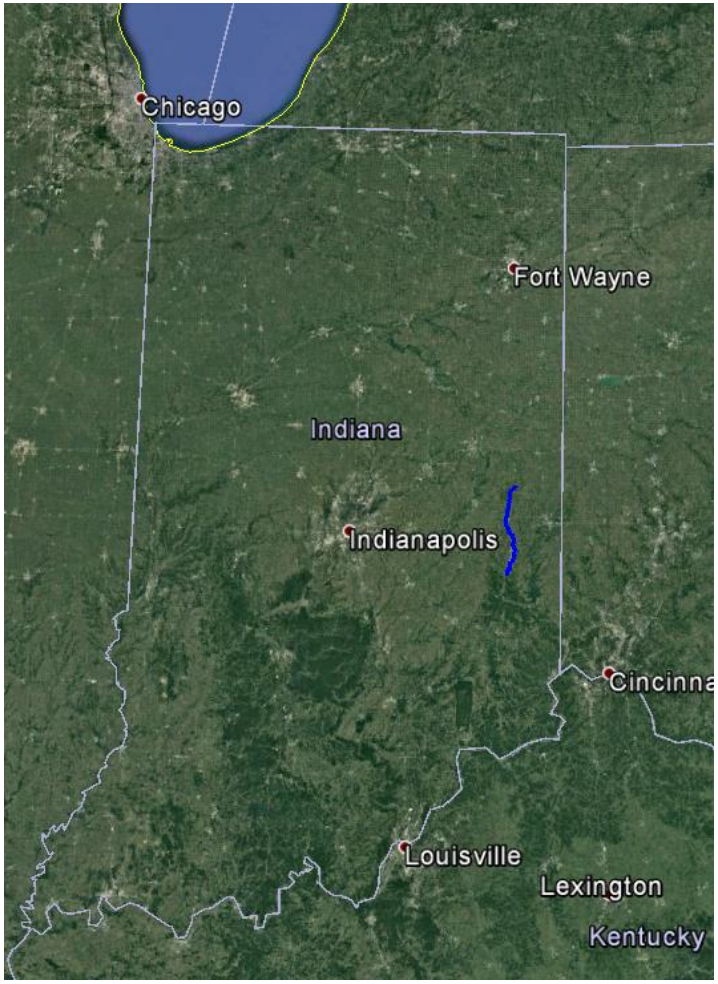
DNR
Indiana Department of Natural Resources

Outline

- Introduction
- Project Overview and Schedule
- Project Approach
- Challenges
- Conclusion

Project Overview

- Perform a detailed Flood Insurance Study of West Fork of the Whitewater River in eastern Indiana
  - Total Study Reach – 41-miles
  - Time to complete Study – Approximately 2.5 months

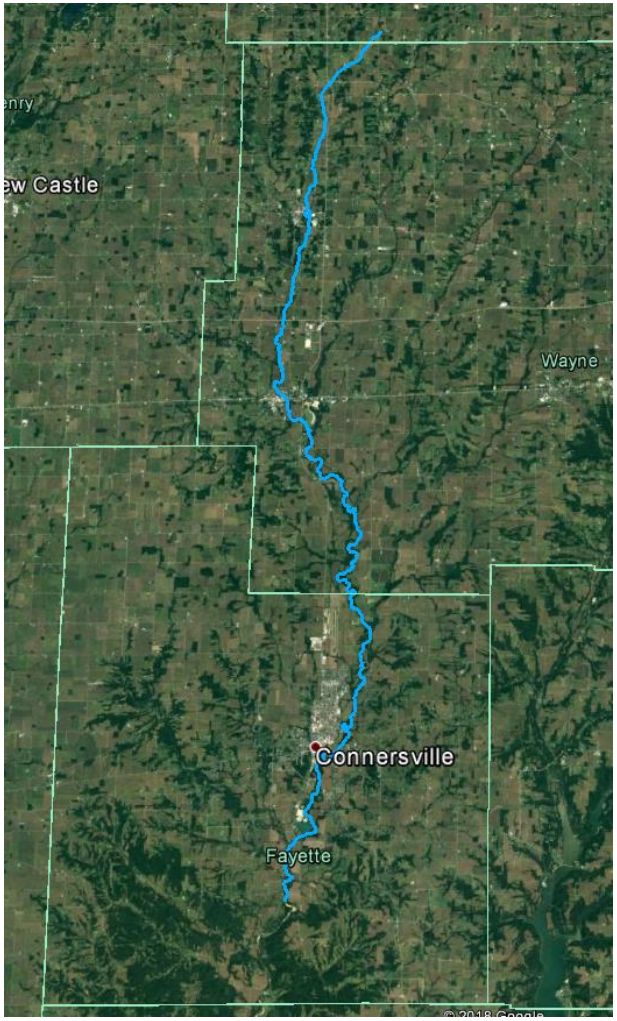


Introduction (by DNR?)

- Background of need for study
- Need of study
- Etc.

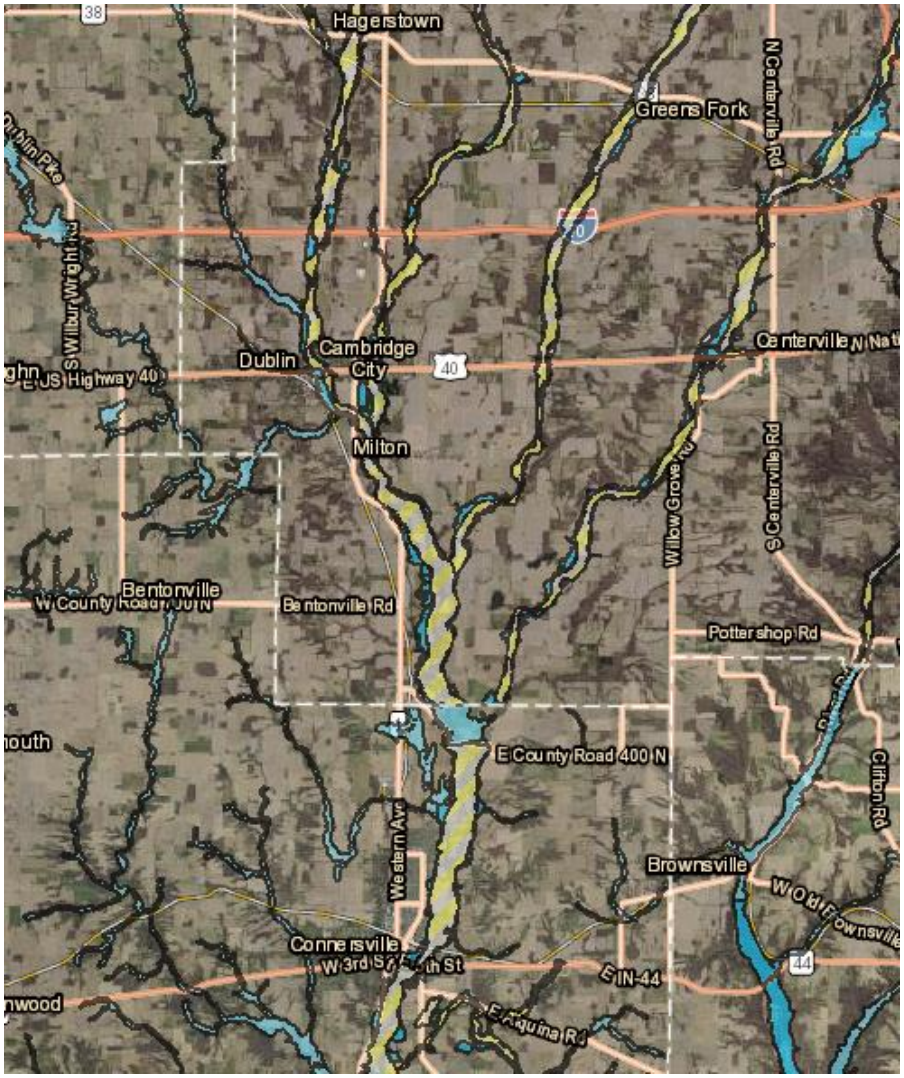
Project Description

- Perform detailed hydraulic study of West Fork Whitewater River from 0.11 miles downstream of CR 480 S in Fayette Co, IN, to Wayne/Randolph Co line – 41 miles
  - Includes approximately 4 towns
  - DA ranges from 13 to 536 square miles
  - 1% Annual Chance Q ranges from 2,250 to 46,600 cfs



Project Description

- Completely remap and replace the existing flood insurance study and maps
- West Fork Whitewater River existing studies completed in 1982

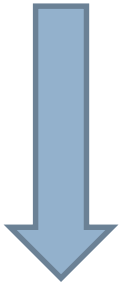


Project Requirements

- Develop a single, continuous 1-D Steady-State model in HEC-RAS
- Profiles should include the 10%, 4%, 2%, 1% and 0.2% annual chance water surface elevations
- Delineate a floodway allowing maximum of 0.14-feet of surcharge of 1% annual chance event.
- Floodplain mapping for the floodway, 1% and 0.2% annual chance floods
- FEMA Flood Insurance Study tables and profiles for each of the two counties.

Timeline

- Discussion between HNTB and IDNR– Early August 2018
- IDNR Delivers Survey Data to HNTB – August 15, 2018
- HNTB Receive Flow Data from IDNR – August 23, 2018



- HNTB to Submit all deliverables to the IDNR – October 31, 2018

Data Provided by IDNR

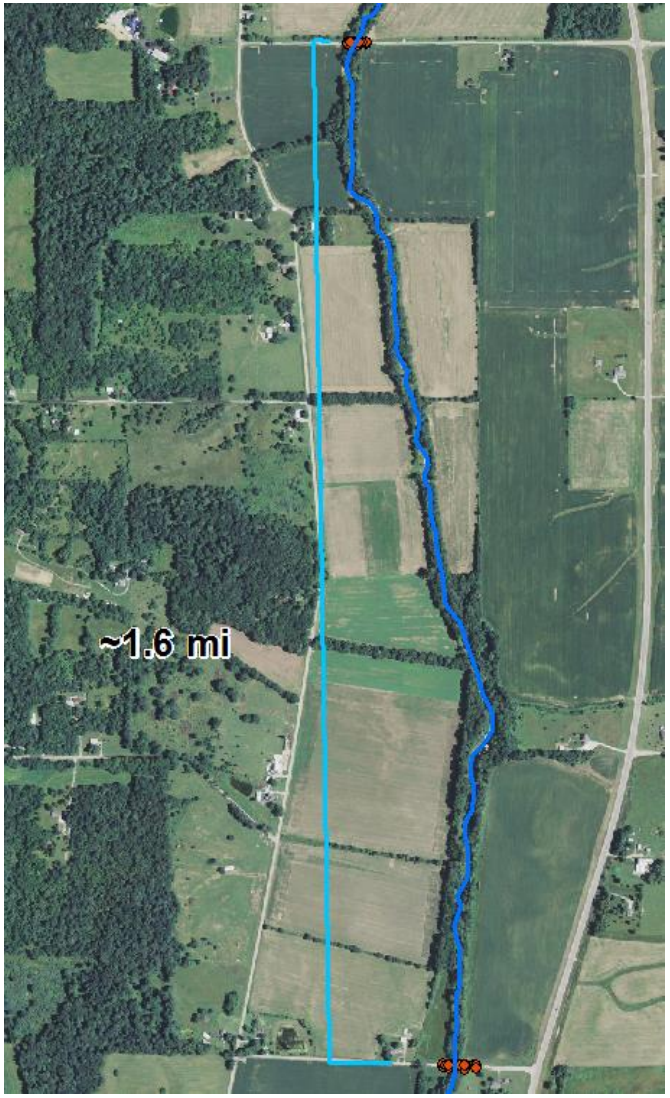
- Survey Data – Channel and Bridge Geometry, 31 bridges total

- 20 Flow Change Locations – Based on Regression Equations

Challenges

- Timeframe – We had about 2.5 months do perform the detailed analysis, including floodway delineation and preparing of deliverables.

- Survey:
  - Survey only at structures. Nothing between structures and often times we had long segments without survey



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Challenges

- Staffing – Trying to figure out who to put on the job, while maintaining all other deadlines

- Contracting:
  - Due to dollar amount and timeframe, State of Indiana had to issue Authorization of Emergency Capital Expenditure

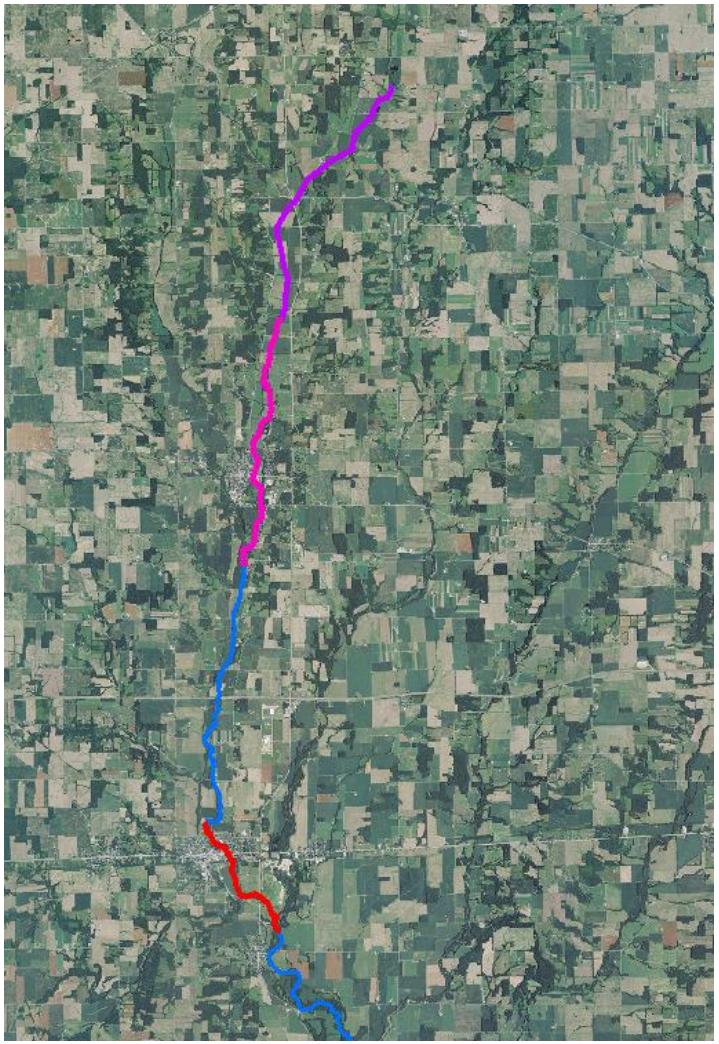
Project Approach

1% Profiles

- Broke up study reach into 7 subsegments
- Had 3 modelers work on segments independently.
- Break points generally set in rural areas, away from structures, or at flow change locations
- Import individual geometries into a master merged model.

Floodway

- Broke up into 4 subsegments from merged model, with 2 modelers.
- Previous 3rd modeler focused on preparing other deliverables.



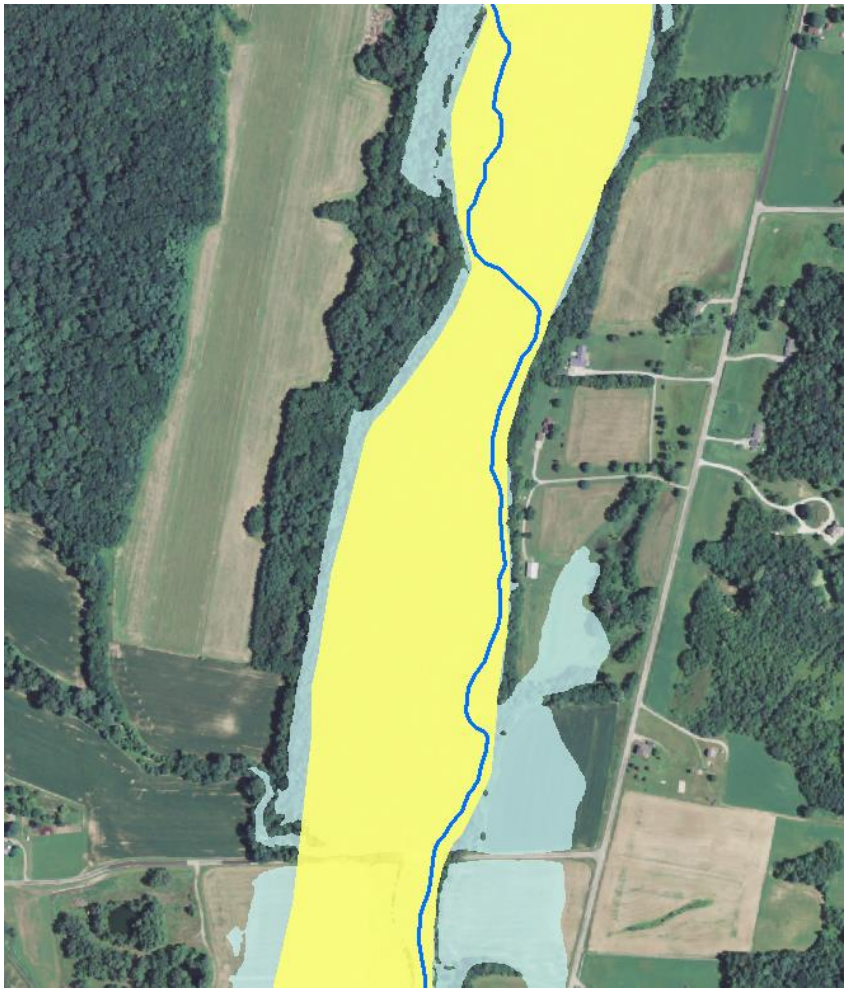
Project Approach

Survey Gaps

- Models built on Statewide LiDAR
- Survey data just used for channel bottoms
- At times, we had to get creative

Team Effort

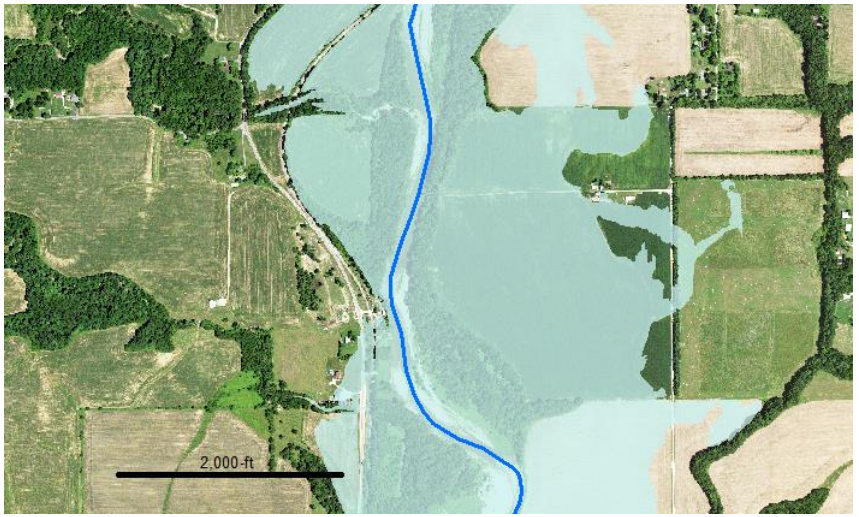
- Team effort for floodplain smoothing and preparing deliverables
- 10 different HNTB engineers helped at various stages of the project.



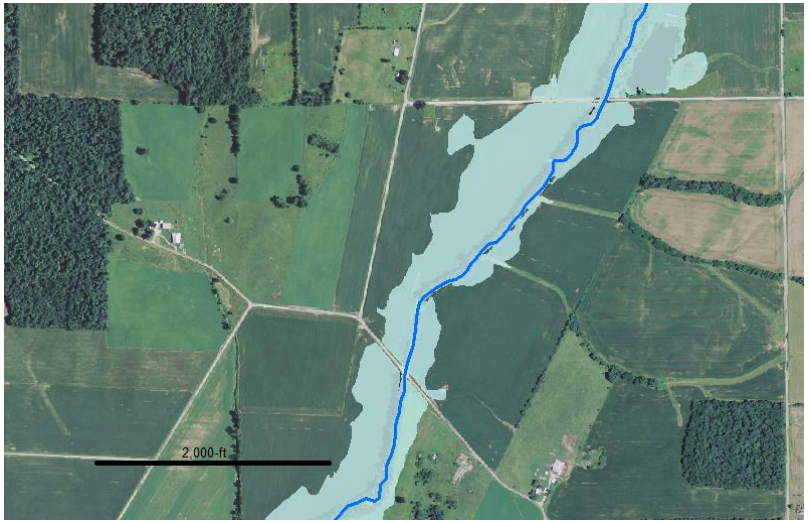
Specific Modeling Challenges

Variations in river/stream types

- Downstream End, large River Modeling



- Upstream End, small creek modeling



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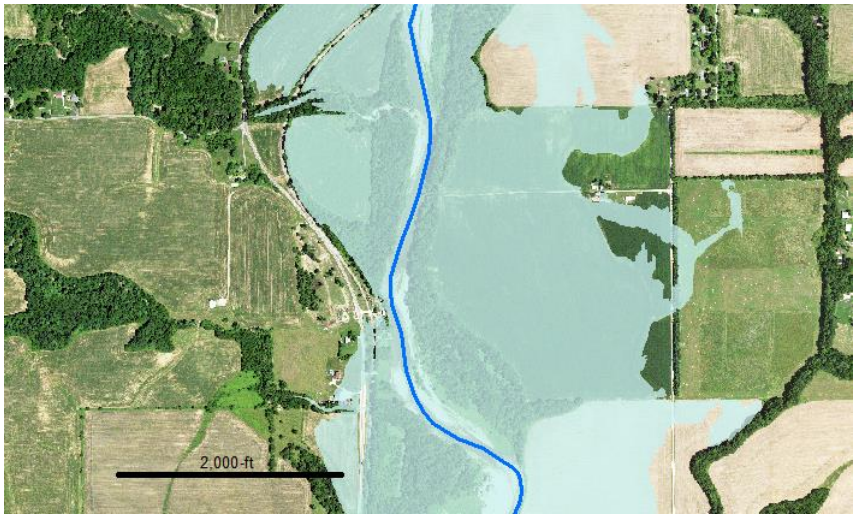
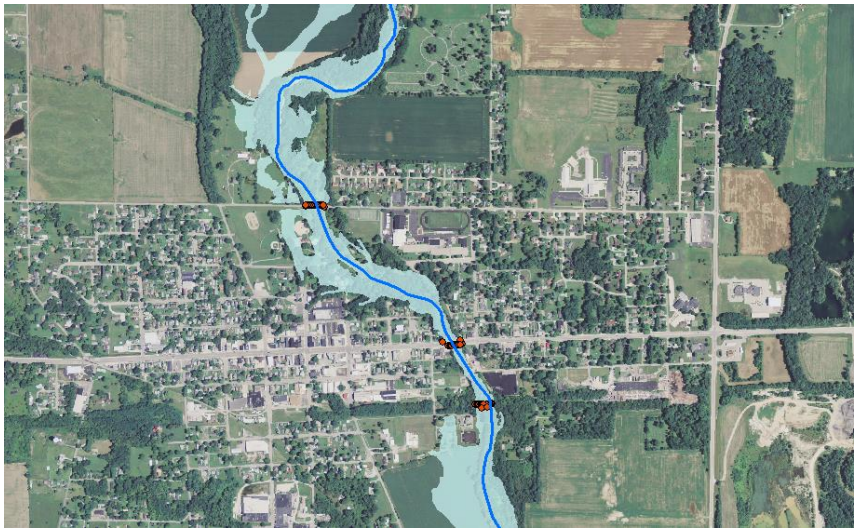
Specific Modeling Challenges

<u>Variations in river/stream types cont'd</u>

- Rural floodplains, without structures



- Urban (small town) floodplains, with several structures and narrow channels

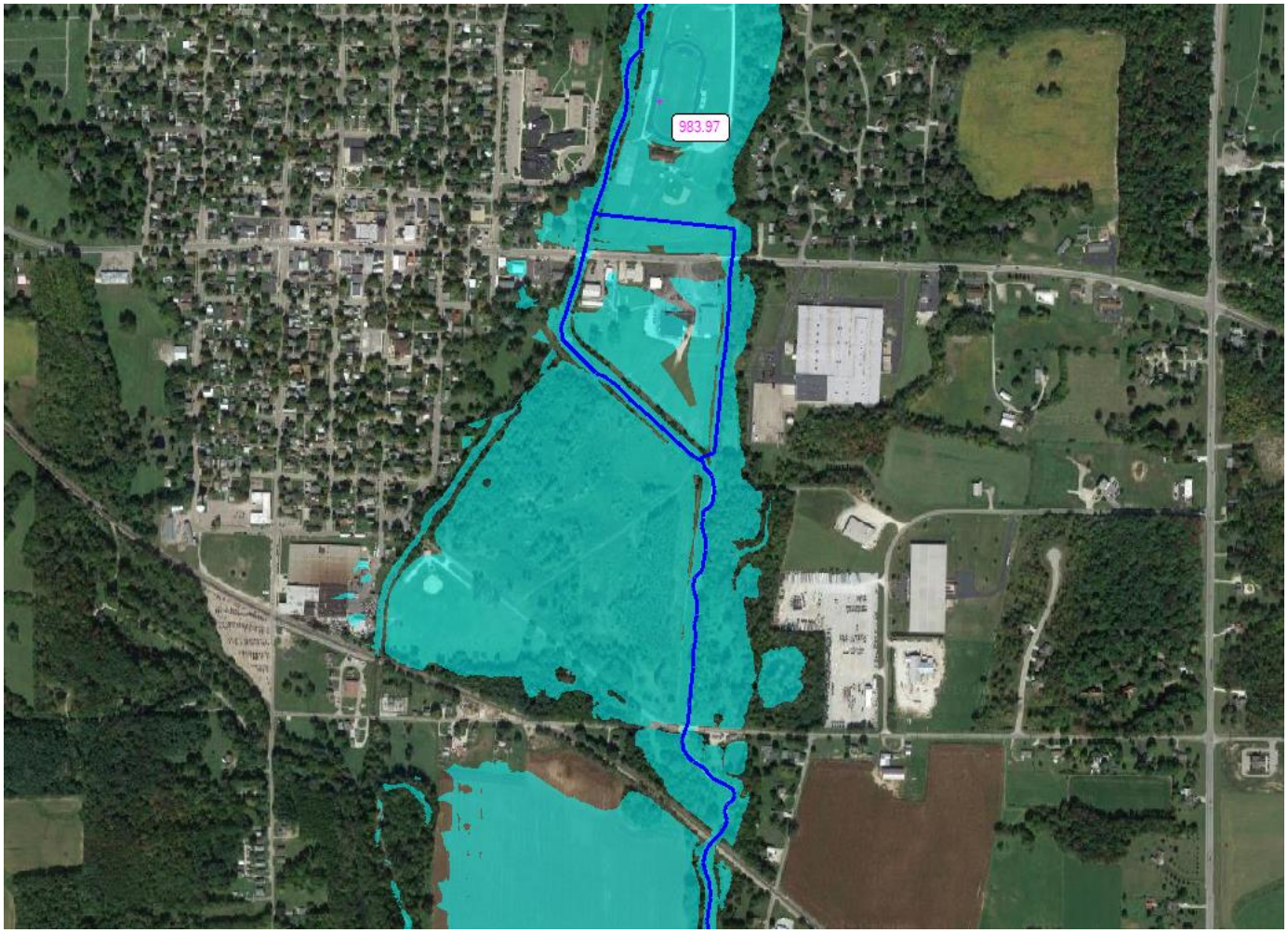


Specific Modeling Challenges

Farm Berms – All over the place

Specific Modeling Challenges

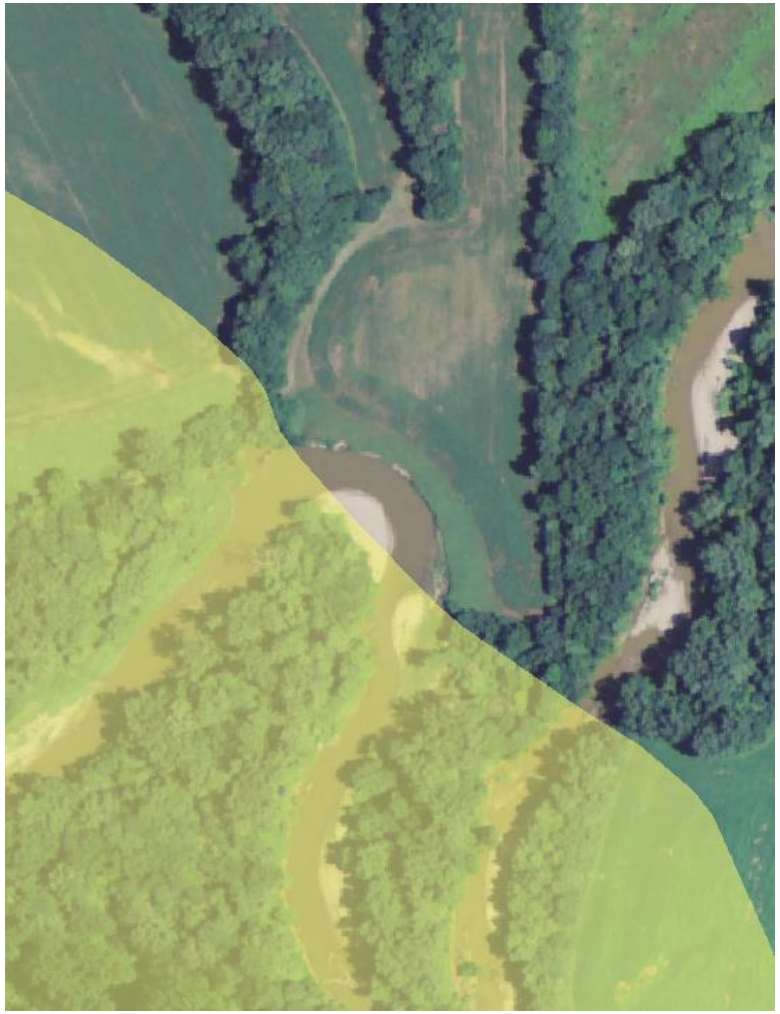
Hagerstown



Delivery and Response

- Submitted everything to IDNR on October 31, 2018

- Received review comments and revised. Helping to wrap up LOMR application.



Conclusion

- Delivered a detailed FIS study for the Indiana Department of Natural Resources within the requested timeframe.

Questions