Cal-Sag Channel Watershed Floodplain Analyses in Cook County, Illinois

FEMA funded project by
Illinois State Water Survey

July 22, 2015, Orland Park, IL

ISWS Staff

- Sally McConkey – Engineering Manager
- Glenn Heistand – Senior Hydraulic Engineer
- Amanda Flegel – Project Engineer
- Aaron Thomas – Project Engineer
- Emily Jenkins – H&H Engineer
- Ryan Meekma – GIS Team Lead

ILLINOIS STATE
WATER SURVEY
PRAIRIE RESEARCH INSTITUTE

Agenda

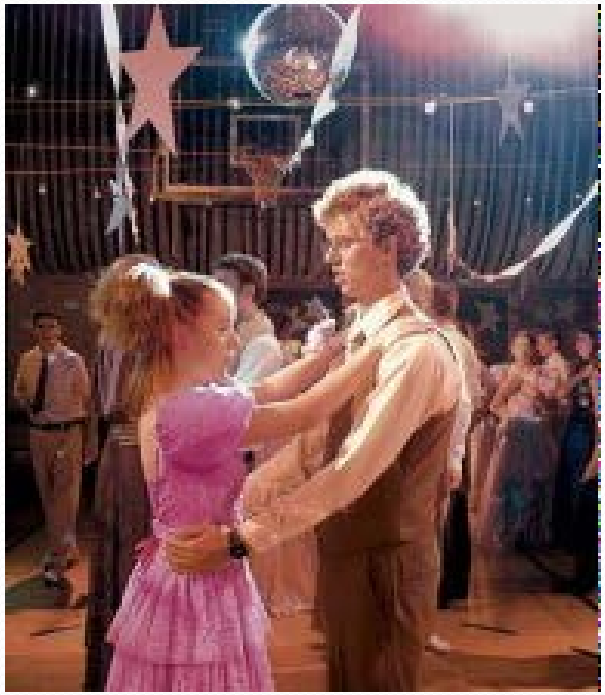
1. Meeting Goals and Brief Overview of Project
   - Glenn Heistand, P.E., CFM
2. Hydrology Details
   - Amanda Flegel, P.E., CFM
   - Emily Jenkins, P.E., PhD
3. Hydraulic Details
   - Aaron Thomas, P.E., CFM
   - Emily Jenkins, P.E., PhD
4. Review of Draft Work Maps
   - Ryan Meekma, GISP, CFM
5. Discussion of Next Steps
   - Sally McConkey, P.E., CFM
6. Comment Forms

Meeting Goals

Community input throughout the process is essential to flood risk management. You are getting the first possible look at the analysis and DRAFT results so that you can provide your feedback early on.

- Provide an overview of the Hydrologic and Hydraulic Analysis
- Present the DRAFT Results
- Answer questions about the analysis
- Collect your concerns /feedback/technical data

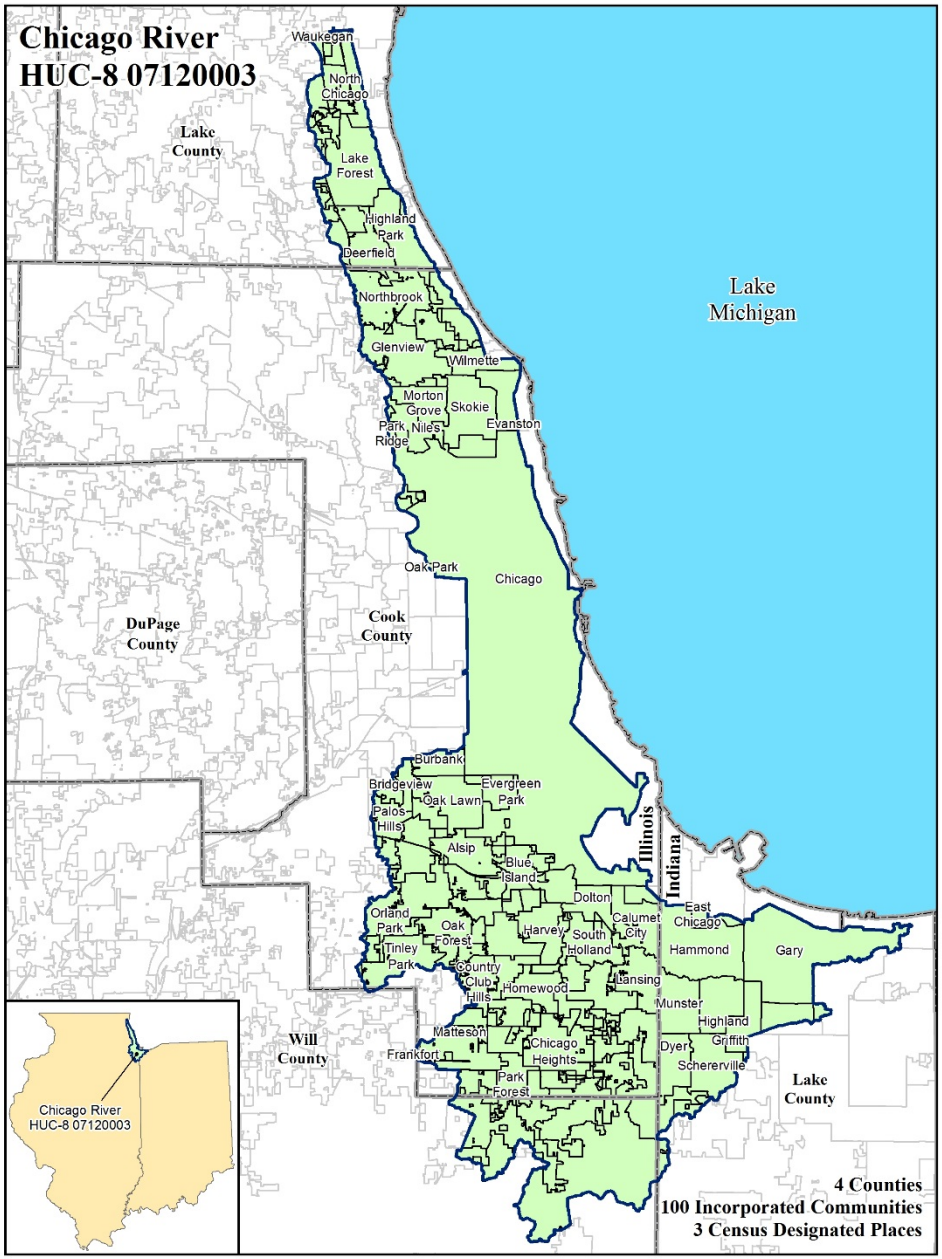
Welcome to the First Dance!



It's not the Last Dance!

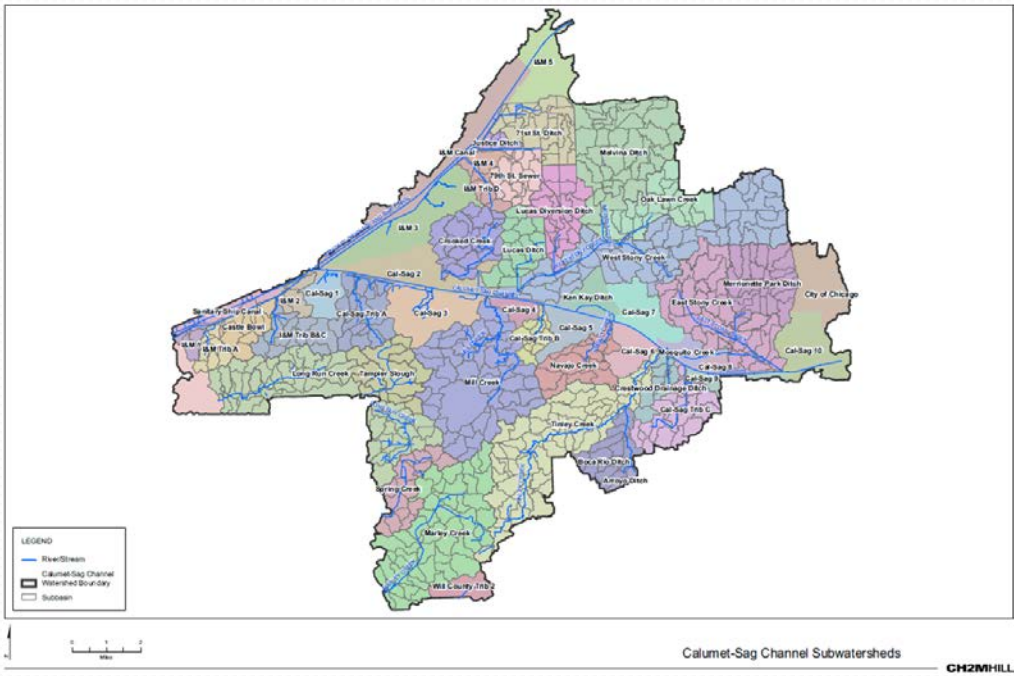
Project History

- Discovery Meetings: **November 13-14, 2013**
  - Documenting Community Knowledge
  - Mitigation
  - CRS
- Discovery Report and Database: **February 12, 2015**
  - Needs & Recommendations
  - Community input



Project Scope

- **Tinley Creek:**
  - Watershed is approximately 12.9 square miles
  - 14.5 lineal miles
- **Mill Creek:**
  - Watershed is approximately 10.6 square miles
  - 8.1 lineal miles
- Study originally performed by MWRDGC for DWP
- ISWS converted models from unsteady to steady state
- ISWS added Floodway
- IDNR-OWR has reviewed and approved H&H



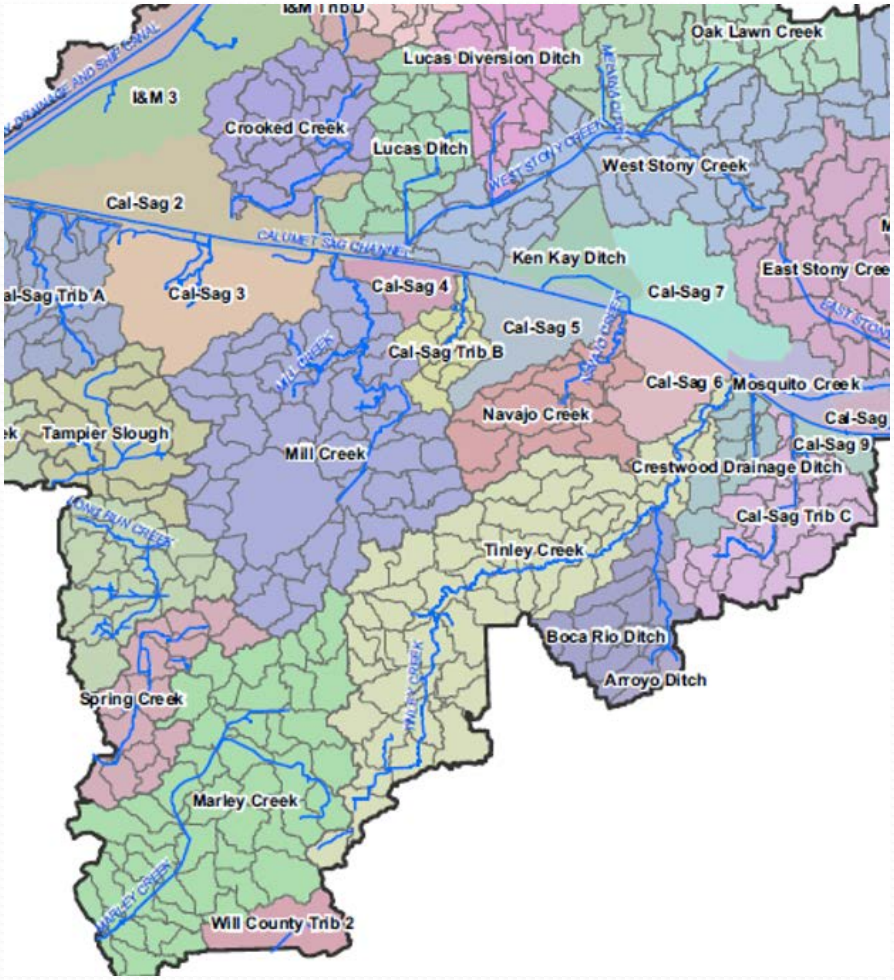
Hydrology

DWP Analysis

- HEC-HMS
- Soil Conservation Service (SCS) curve number (CN) loss method
- Parameters produced through HEC-geoHMS from geographic information systems (GIS) data
- land use: 2001 CMAP land use inventory
- soil data: 2002 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Soil Survey
- Combined to produce Curve Numbers.

ISWS HEC-HMS Analysis

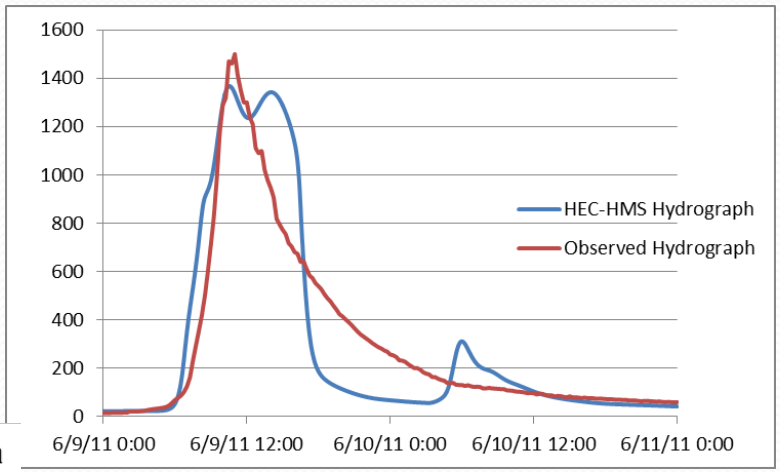
- Kinematic Wave and Lag methods for ditch and storm sewer routing
- Muskingum-Cunge routing on mainstem with Modified Puls used for storage behind bridges
- Bltn 71, Huff distribution
- 12hr Critical Duration

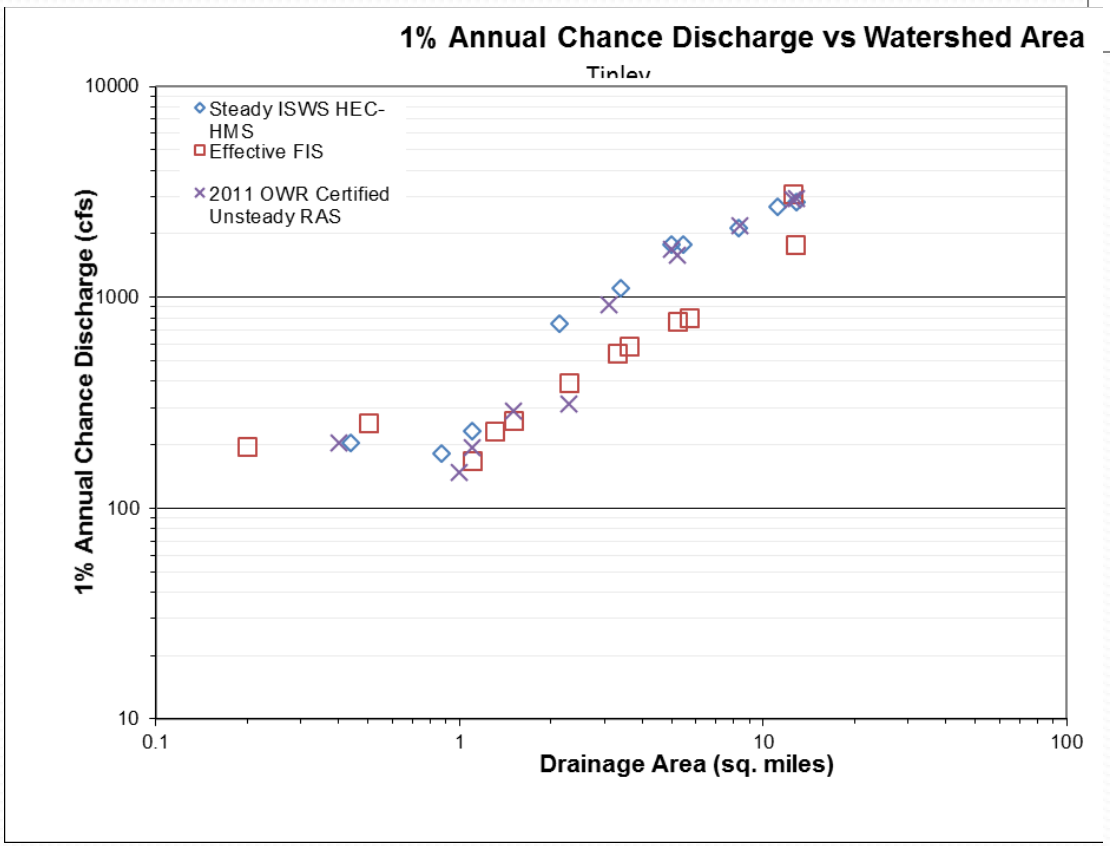


Hydrology

Tinley Creek Calibration

- Calibration June 2011
- Verification April 2013, July 1996





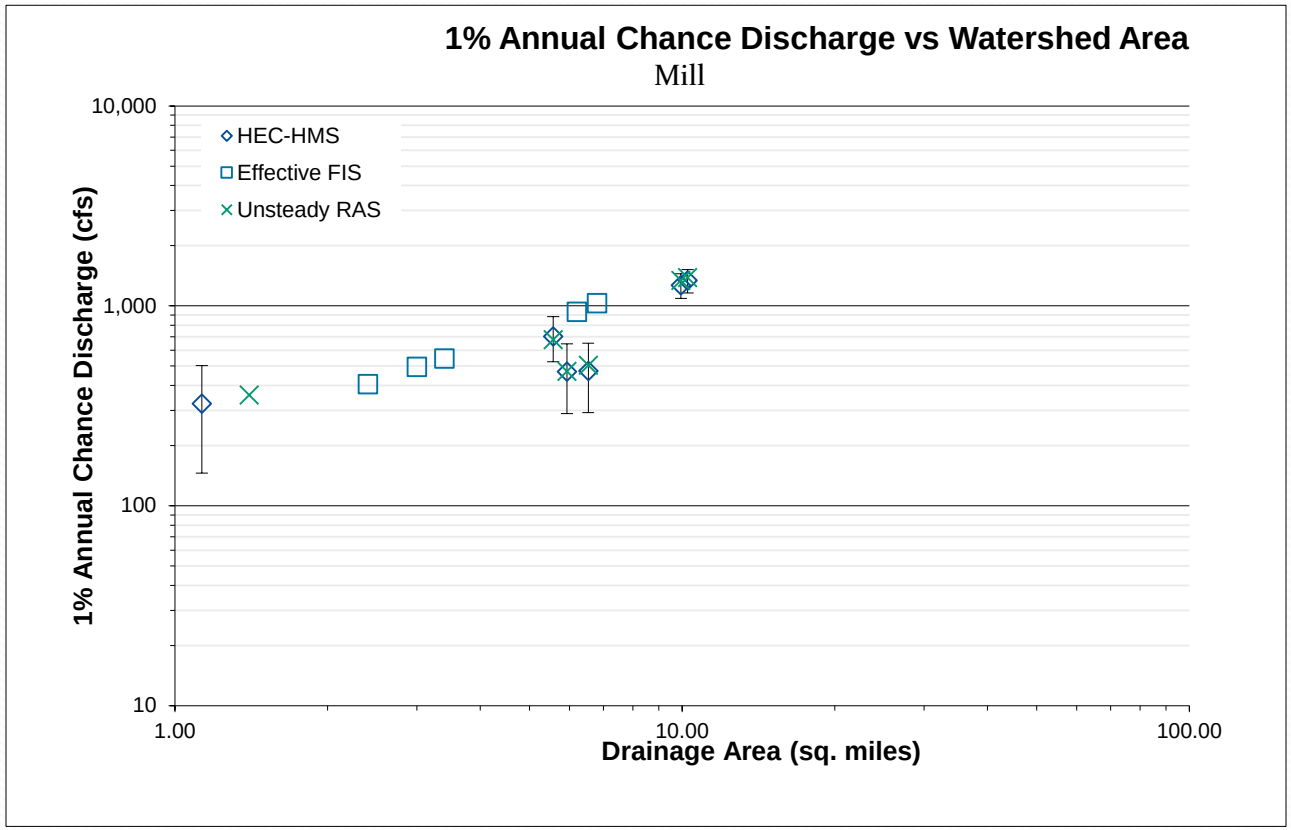
Tinley Creek HEC-HMS proposed peak discharge values

- Agree well with MWRD DWP
- 16% higher than statistical gage analysis
- Increase compared to effective FIS at downstream reach

Hydrology

Mill Creek HEC-HMS proposed peak discharge values

- Agree well with MWRD DWP
- Decrease compared to effective FIS at downstream reach



Hydraulics –

Tinley Creek

- HEC-RAS Version 4.1.0
- HEC-GeoRAS Version 10.0
- Channel and Bridge data based on field survey (between August 2007 and February 2008). Additional field survey performed March 2008, June 2008 and January 2009.
- Overbank data based on Cook County 2003 LiDAR
- NAVD 1988
- 1 HEC-RAS model prepared for 3 streams
- Ineffective flow: contraction ratio 1:1; expansion ratio 2:1
- Mannings "n values":
  Channel 0.01 – 0.10;
  Overbanks 0.01 – 0.185
- 26 Bridges, 38 Culverts,
- 425 Cross Sections

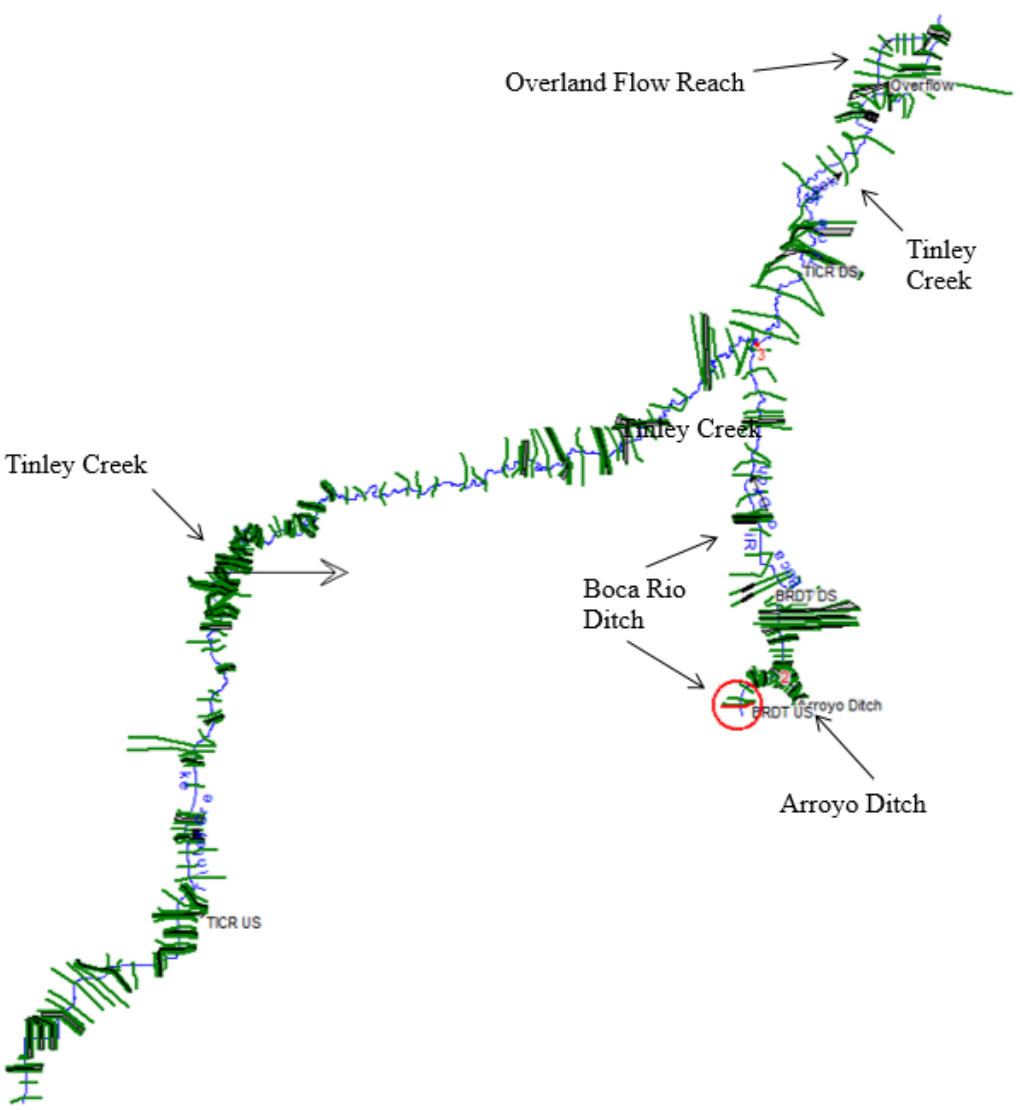


Figure 8. Schematic of the HEC-RAS model for the Tinley Creek Watershed

Hydraulics –
Mill Creek

- HEC-RAS Version 4.1.0
- HEC-GeoRAS Version 10.0
- A total of 1 HEC-RAS models 3 streams
- Channel and Bridge data based on field survey (between August 2007 and February 2008). Additional field survey performed March 2008, June 2008 and January 2009.
- Overbank data based on Cook County 2003 LiDAR
- NAVD 1988
- Ineffective flow: contraction ratio 1:1; expansion ratio 2:1
- Mannings "n values": Channel 0.035 – 0.07; Overbanks 0.04 – 0.10
- 8 Bridges, 31 Culverts,
- 290 Cross Sections

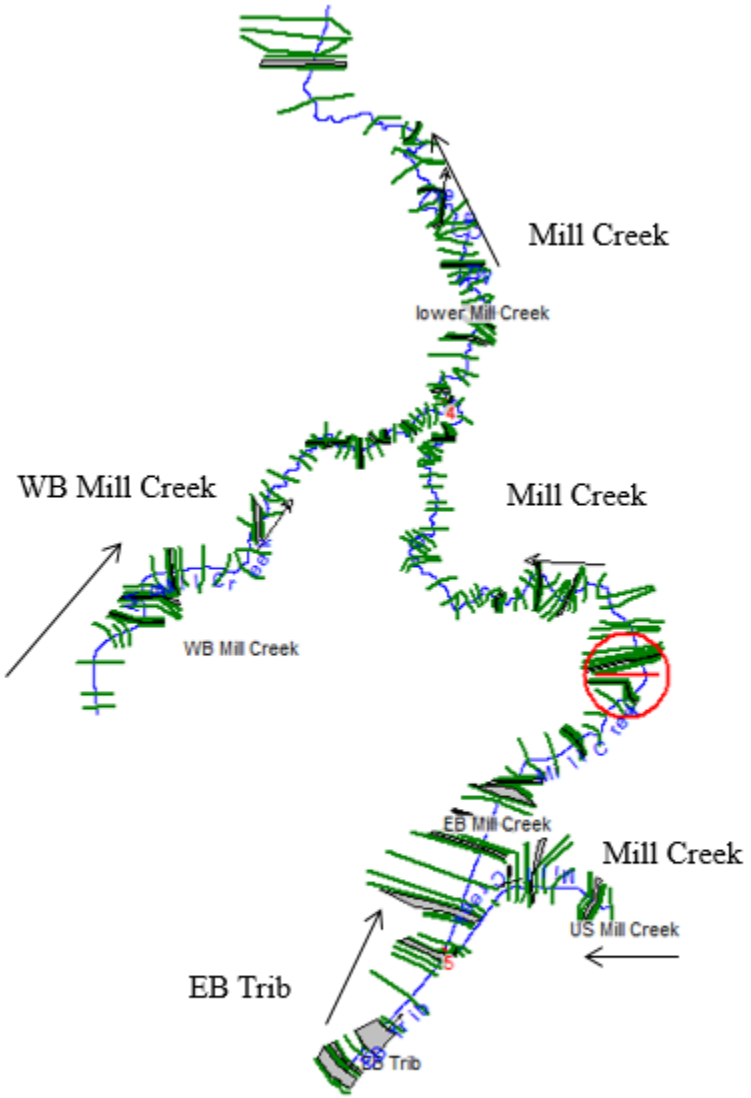
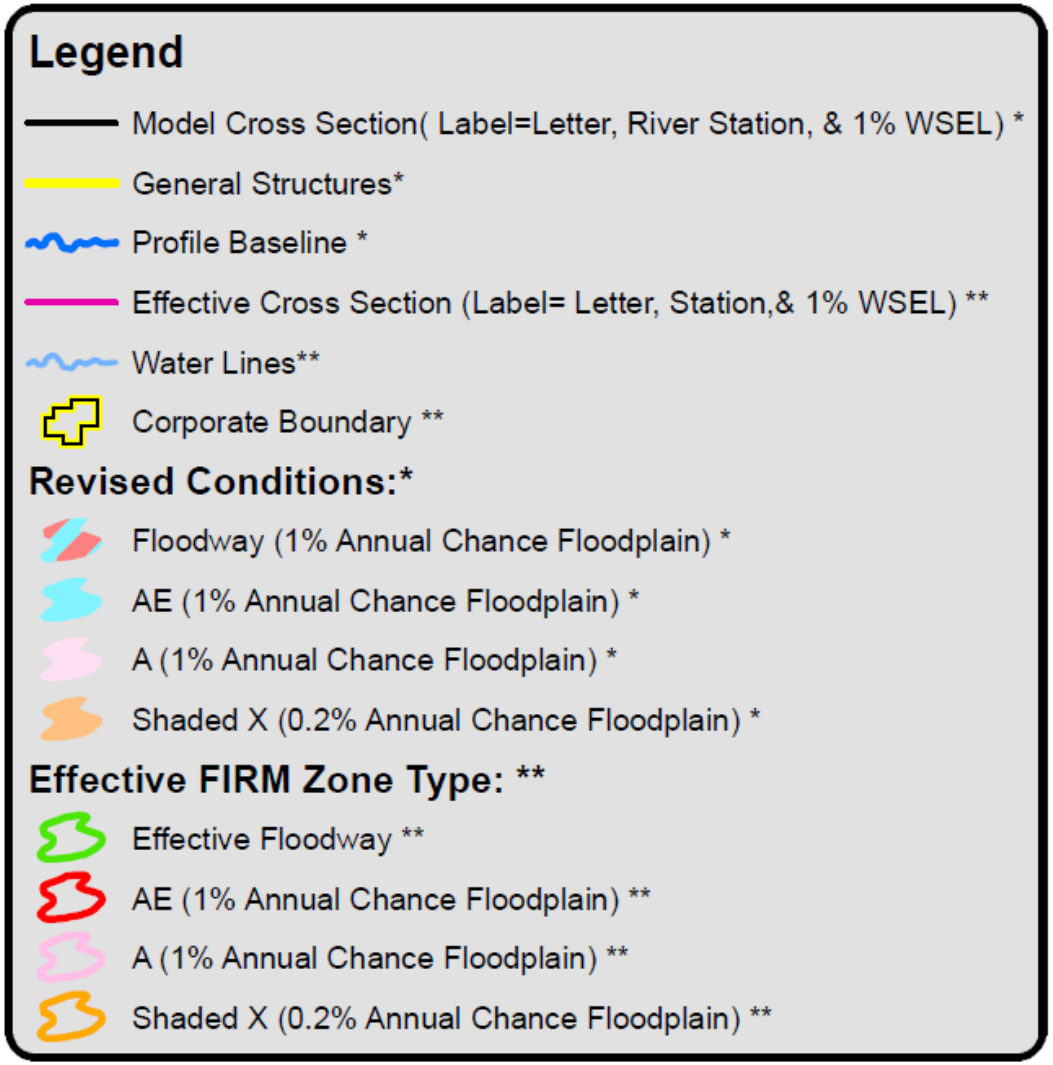


Figure 8. Schematic of the HEC-RAS model for the Mill Creek Watershed

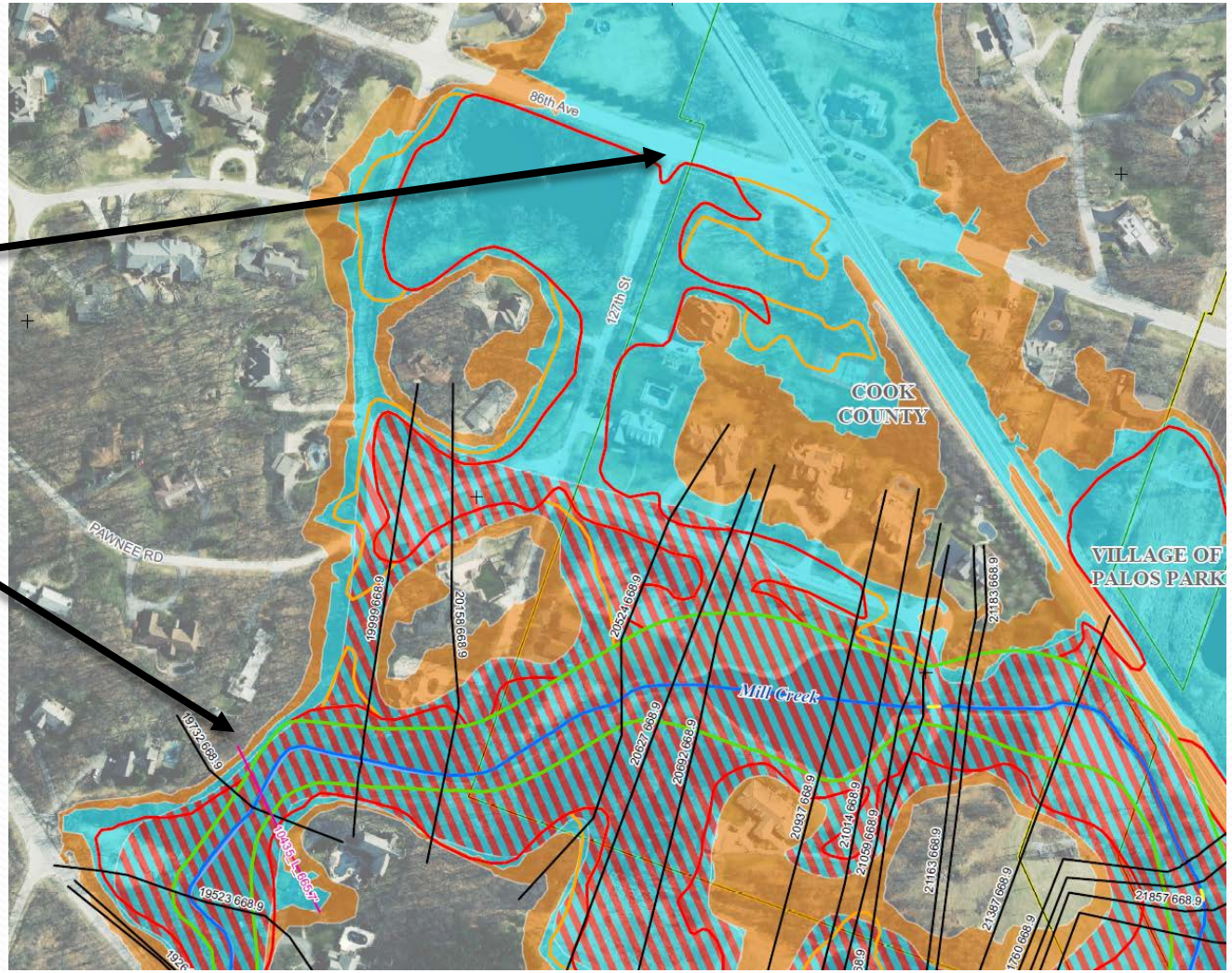
Comparison Map Legend

- Shading = Revised Conditions
- Lines = Effective FIRM Zone



SFHA Change Examples

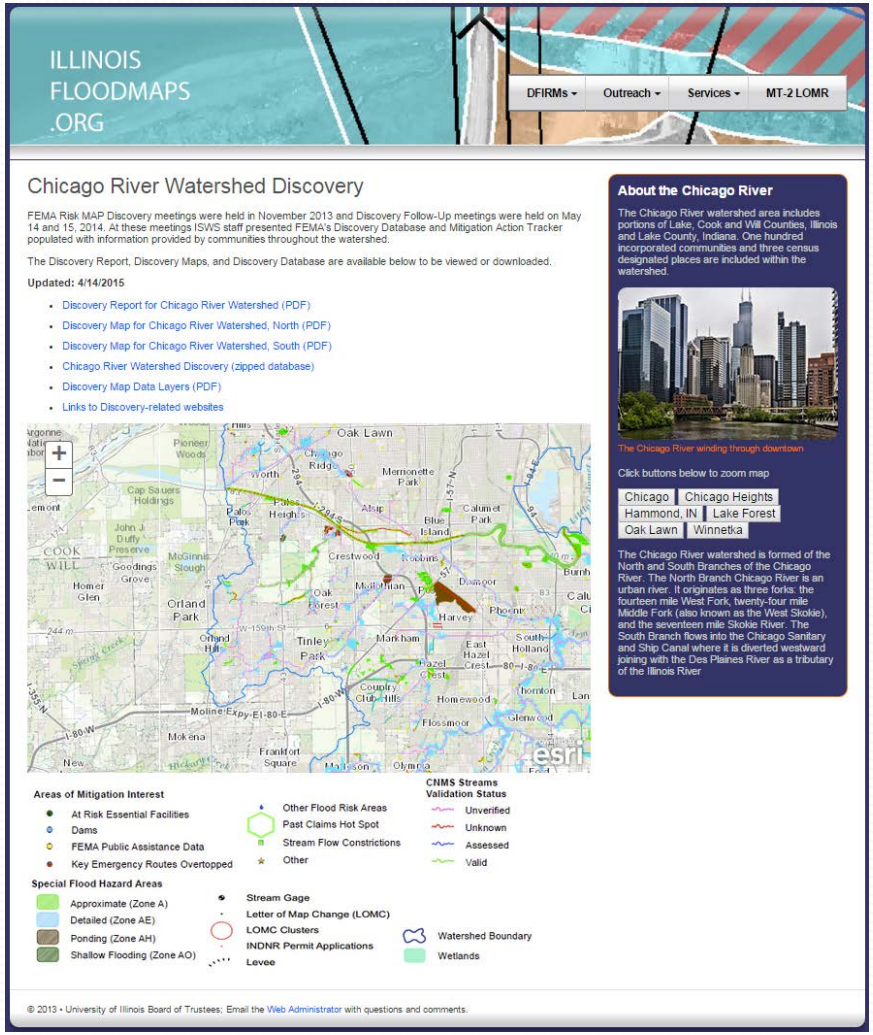
- SFHA Increase at 86th & 127th
- Effective XS L
  - WSEL = 665.7'
  - Revised=668.9'



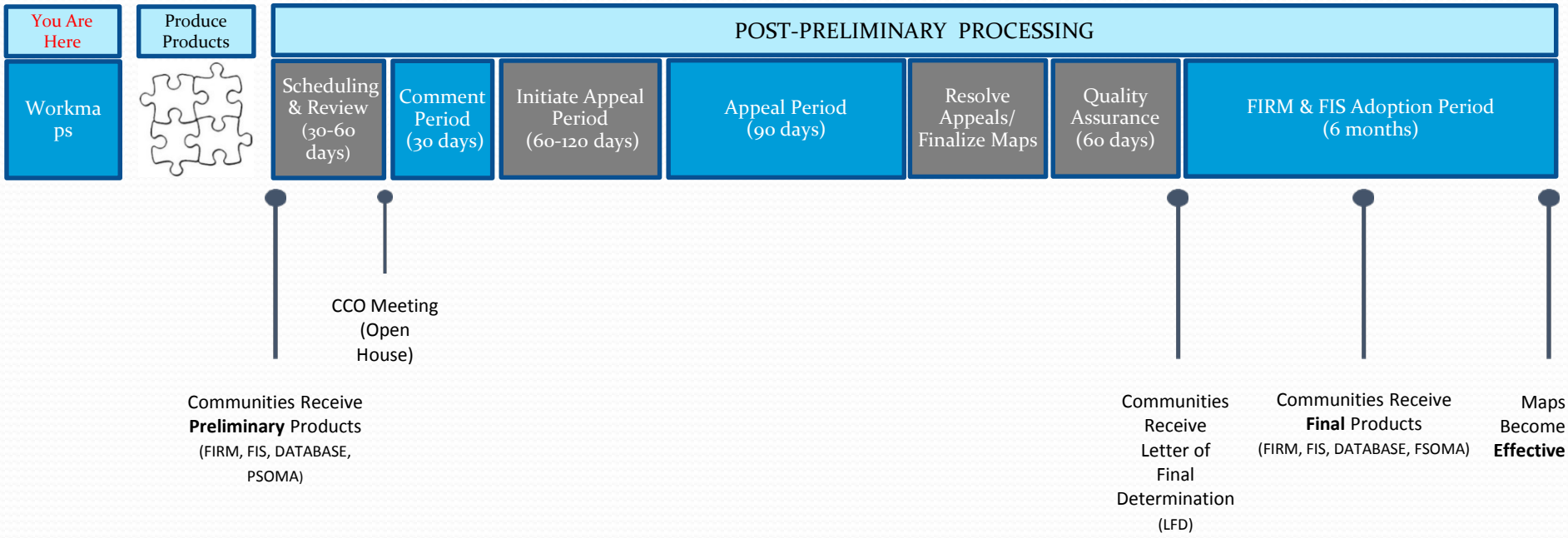
http://www.illinoisfloodmaps.org

click on *Outreach* tab

- Discovery Report for Chicago River Watershed
- Discovery Map for Chicago River Watershed (N&S)
- Chicago River Watershed Discovery Database
- Discovery Map Data Layers
- Links to Discovery-related websites



Processing of Flood Insurance Rate Maps



FEMA

Administrative Processes

- 30 Day Comment Period
  - Non-technical issues related to the floodplain
  - Scrivener's errors/mistakes (misspelled street names, corporate boundary changes, omissions)
  - Begins at open house
- 90 Day Appeal Period
  - Disagreements based on technical data
  - Data is required to support appeals

The Appeals Process

1. Flood Hazard Determination (FHD) Notice appears in the Federal Register & on FEMA's web site.
2. Eligible communities are notified by certified letter detailing the process
3. Notice appears twice in local newspapers
4. Appeal period begins on date of second local newspaper publication
5. Citizens submit appeals to their community
6. Community submits appeals to ISWS
7. FEMA resolves appeals; ISWS finalizes map

Appeal Criteria

Communities eligible for appeal include those with:

1. New or revised Base Flood Elevations (BFEs) & base flood depths
2. New or revised Special Flood Hazard Area (SFHA) boundaries
3. Changes in SFHA zone designation
4. New or revised regulatory floodway boundaries

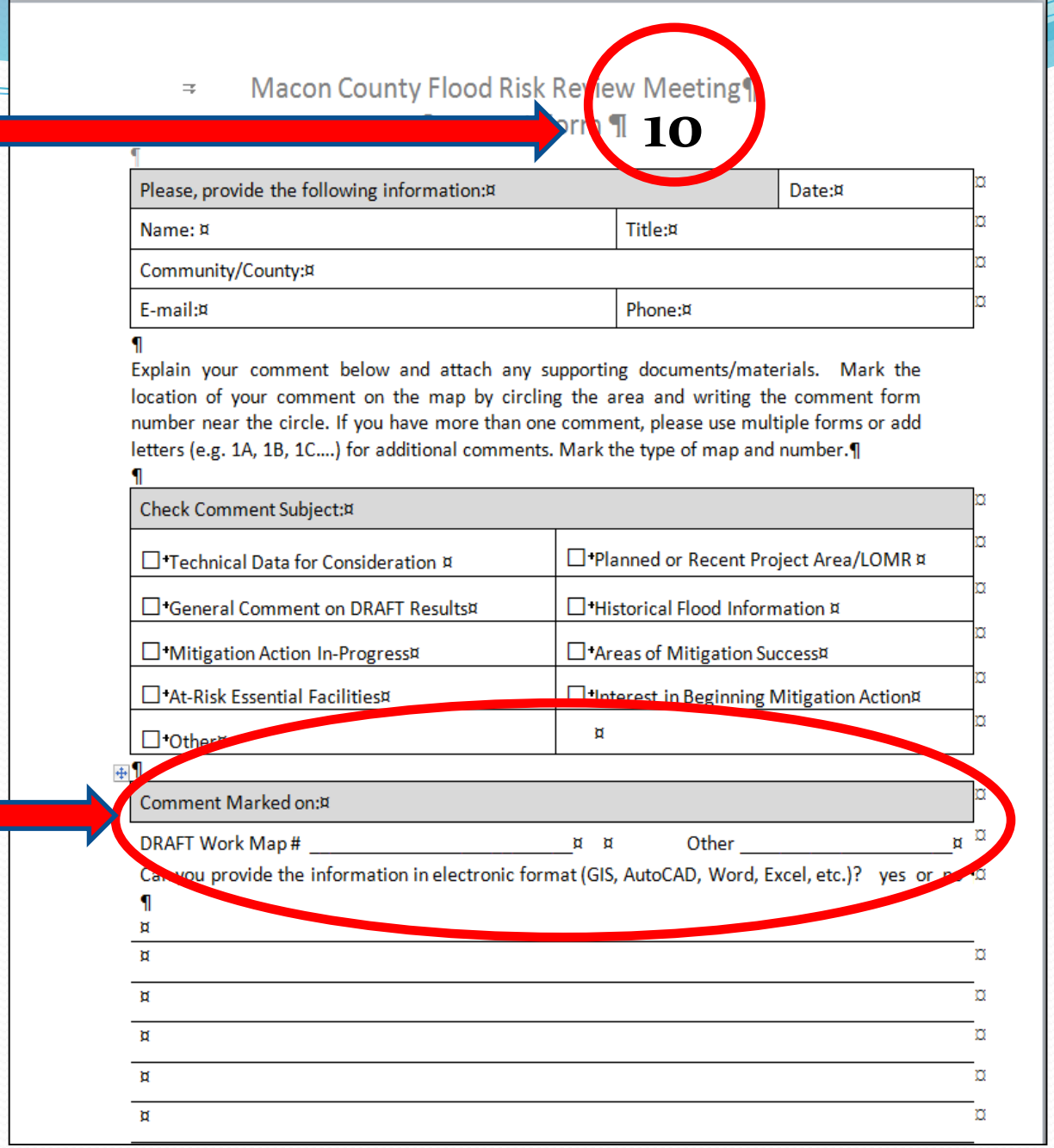
We are asking for your input!

- Review the maps.
- ASK questions!
- Provide technical data and feedback.
- Fill out the comment sheets.
- Mark up the maps.
- Get our contact information.

Comment Number

Provide data in electronic format when available!

Map Marked



Macon County Flood Risk Review Meeting¶

Form ¶ 10

Please, provide the following information:¤	Date:¤
Name: ¤	Title:¤
Community/County:¤	
E-mail:¤	Phone:¤

¶

Explain your comment below and attach any supporting documents/materials. Mark the location of your comment on the map by circling the area and writing the comment form number near the circle. If you have more than one comment, please use multiple forms or add letters (e.g. 1A, 1B, 1C….) for additional comments. Mark the type of map and number.¶

¶

Check Comment Subject:¤	
☐ *Technical Data for Consideration ¤	☐ *Planned or Recent Project Area/LOMR ¤
☐ *General Comment on DRAFT Results¤	☐ *Historical Flood Information ¤
☐ *Mitigation Action In-Progress¤	☐ *Areas of Mitigation Success¤
☐ *At-Risk Essential Facilities¤	☐ *Interest in Beginning Mitigation Action¤
☐ *Other¤	¤

¶

Comment Marked on:¤

DRAFT Work Map # _____¤ ¤ Other _____¤

Can you provide the information in electronic format (GIS, AutoCAD, Word, Excel, etc.)? yes or ¤

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Contact information

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