Metropolitan Water Reclamation District of Greater Chicago

Welcome to the March Edition of the 2022 M&R Seminar Series

NOTES FOR SEMINAR ATTENDEES

- All attendees' audio lines have been muted to minimize background noise.
- A question and answer session will follow the presentation.
- Please use the "Chat" feature to ask a question via text to "All Panelists."
- The presentation slides will be posted on the MWRD website after the seminar.
- This seminar has been approved by the ISPE for one PDH and is pending approval by the IEPA for one TCH. Certificates will only be issued to participants who attend the entire presentation.

GREGORY J. BYARD, P.E., CFM
WATER RESOURCES ENGINEER
ILLINOIS STATE WATER SURVEY

Greg Byard joined the Illinois State Water Survey's Coordinated Hazard Assessment and Mapping Program (CHAMP) in 2009 and serves as a Project Engineer and Principal Investigator. Greg leads a team of engineers and GIS professionals in hydrologic and hydraulic analysis of Illinois streams including Physical Map Revisions and Countywide updates to the FEMA regulatory Flood Insurance Rate Maps, real-time flood forecast inundation mapping for NOAA's Advanced Hydrologic Prediction Service, and risk assessments for critical infrastructure. Greg holds a Bachelor and Master of Science in Agricultural and Biological Engineering from UIUC, specializing in Soil and Water Resources Engineering. He is a licensed Professional Engineer and Certified Floodplain Manager.

Greg and his wife Jennifer (also a water resources engineer) have four children (who he hopes will not be joining the background of today's presentation). They reside in Urbana and enjoy spending time outside as much as possible whether gardening, hiking, biking, or kayaking.

Watershed Specific Release Rate Analysis: Cook County, Illinois

Metropolitan Water Reclamation District of Greater Chicago - M&R Seminar Series
March 25, 2022

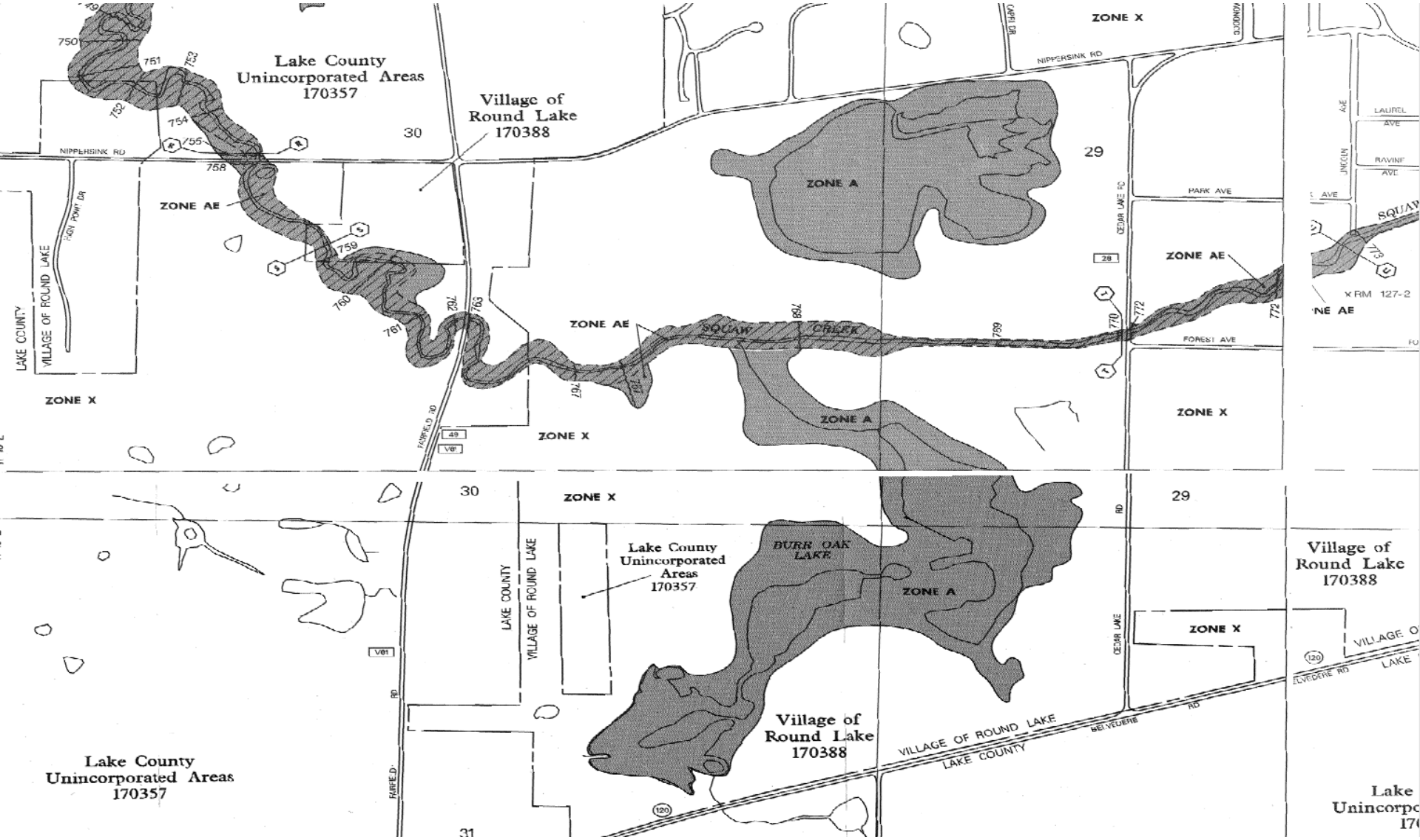
Gregory Byard

ILLINOIS
Illinois State Water Survey
PRAIRIE RESEARCH INSTITUTE

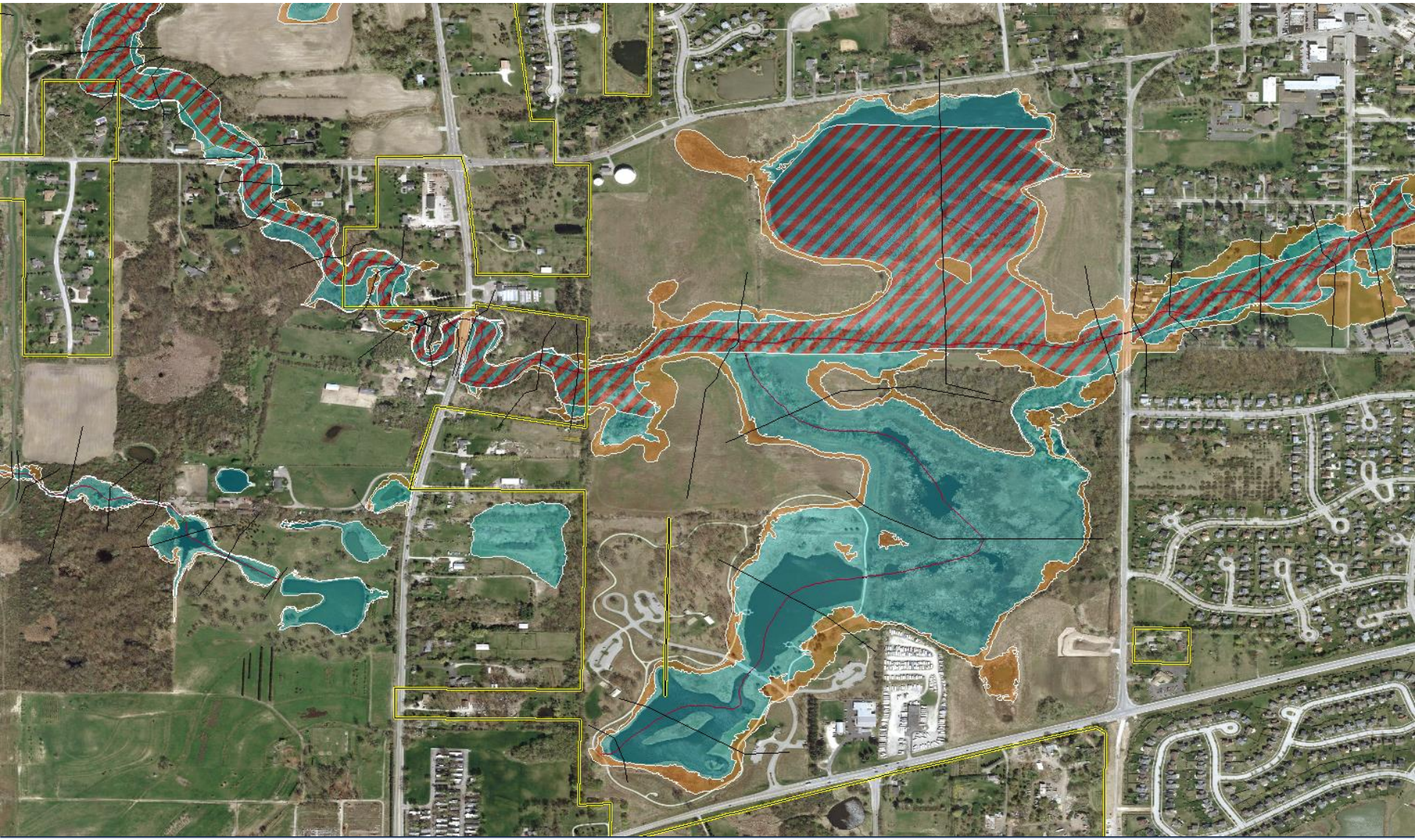
Prairie Research Institute at the University of Illinois

- Illinois State Geological Survey
- Illinois Natural History Survey
- Illinois State Archaeological Survey
- Illinois Sustainable Technology Center
- Illinois State Water Survey
    - Climate and Atmospheric Science
    - Groundwater Science
    - Health and Environmental Applications Laboratory
    - Watershed Science
    - Coordinated Hazard Assessment and Mapping Program

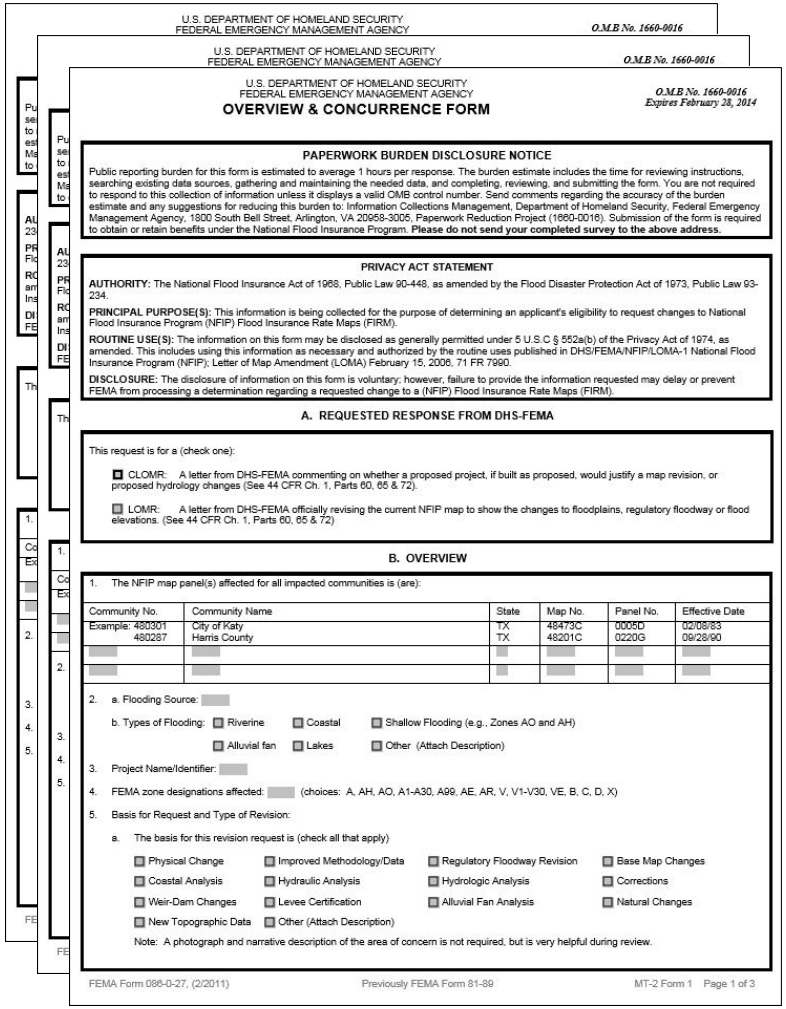
FEMA Regulatory Floodplain Mapping



FEMA Regulatory Floodplain Mapping



Illinois MT-2 LOMR Review



U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
O.M.B No. 1660-0016
Expires February 28, 2014

OVERVIEW & CONCURRENCE FORM

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301	City of Katy	TX	48473C	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90

2. a. Flooding Source:

b. Types of Flooding: ☐ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier:

4. FEMA zone designations affected: (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

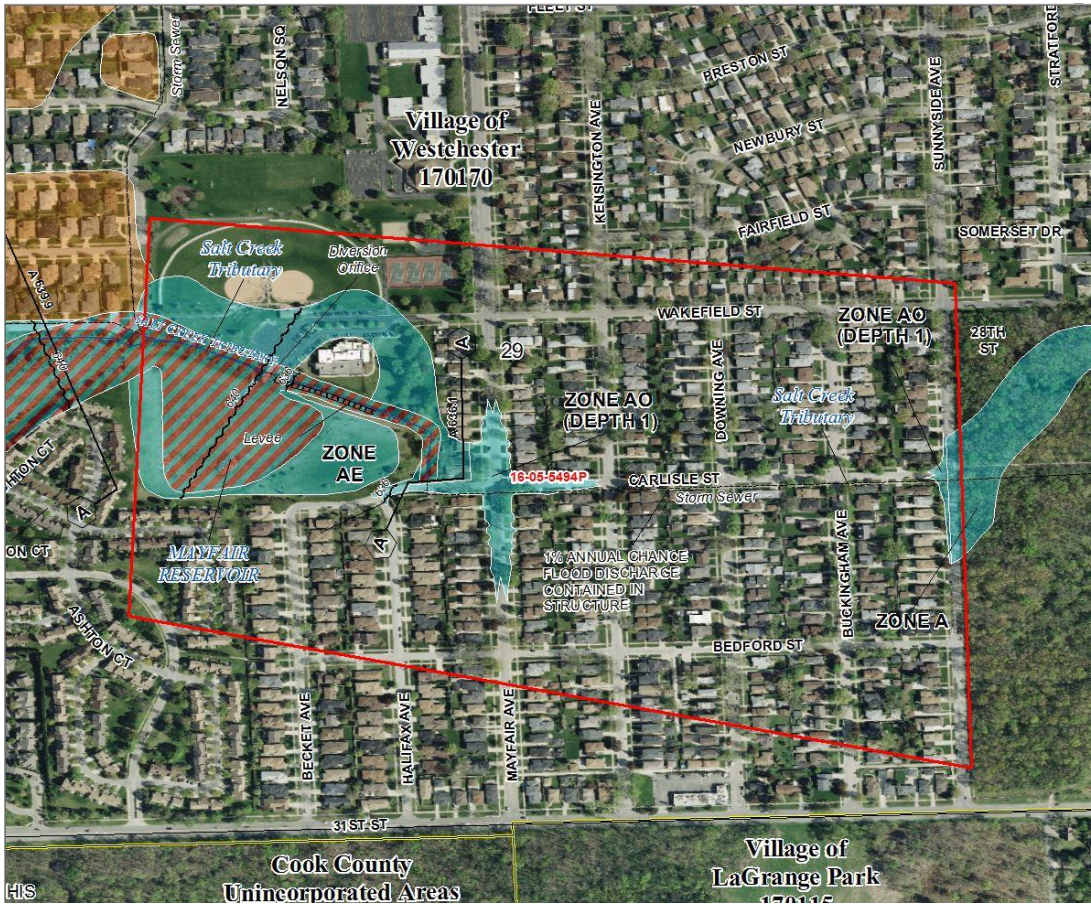
5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

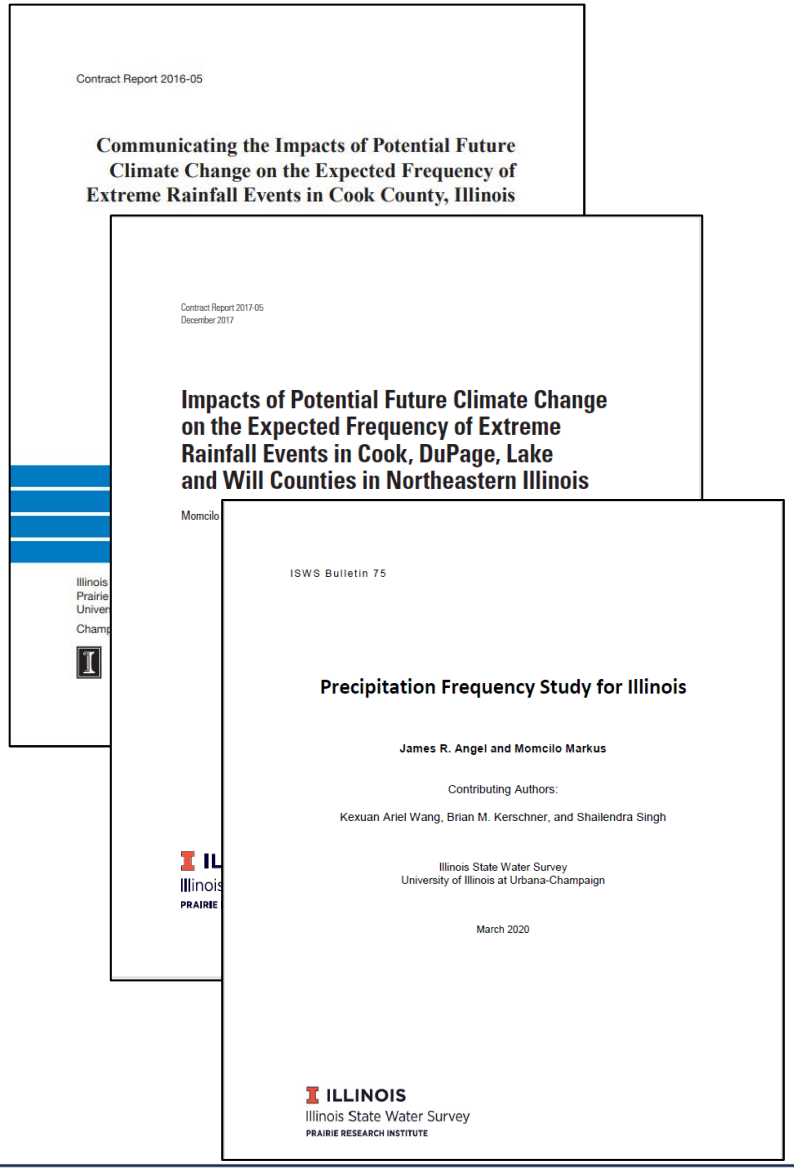
☐ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
☐ Coastal Analysis ☐ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
☐ New Topographic Data ☐ Other (Attach Description)

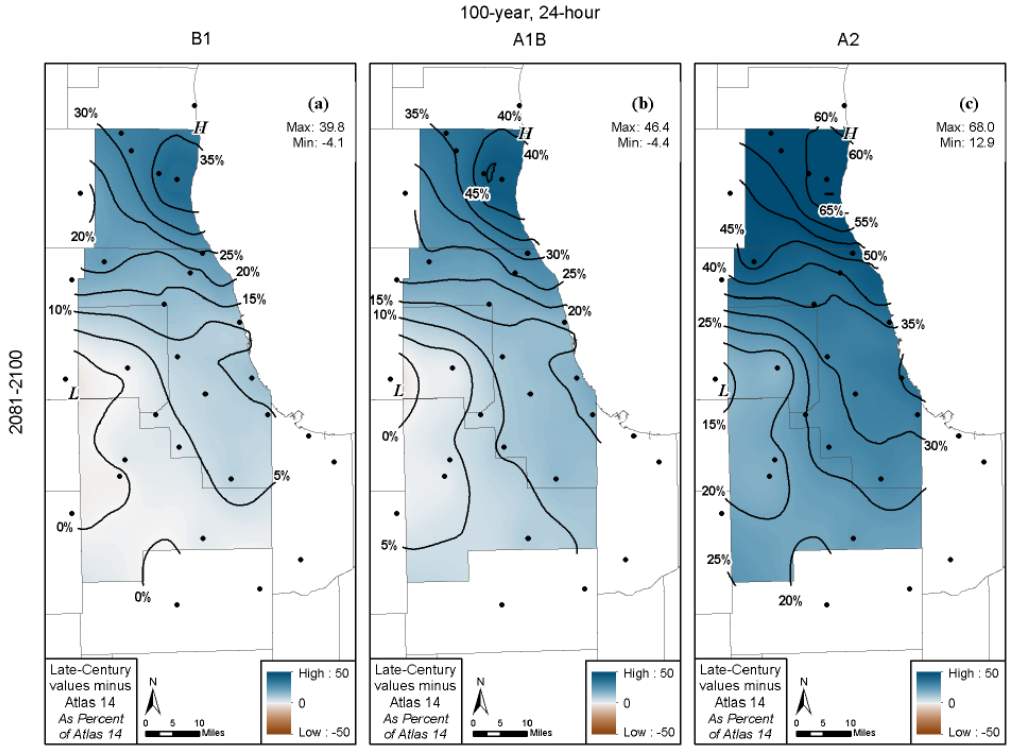
Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

FEMA Form 086-0-27, (2/2011) Previously FEMA Form 81-89 MT-2 Form 1 Page 1 of 3

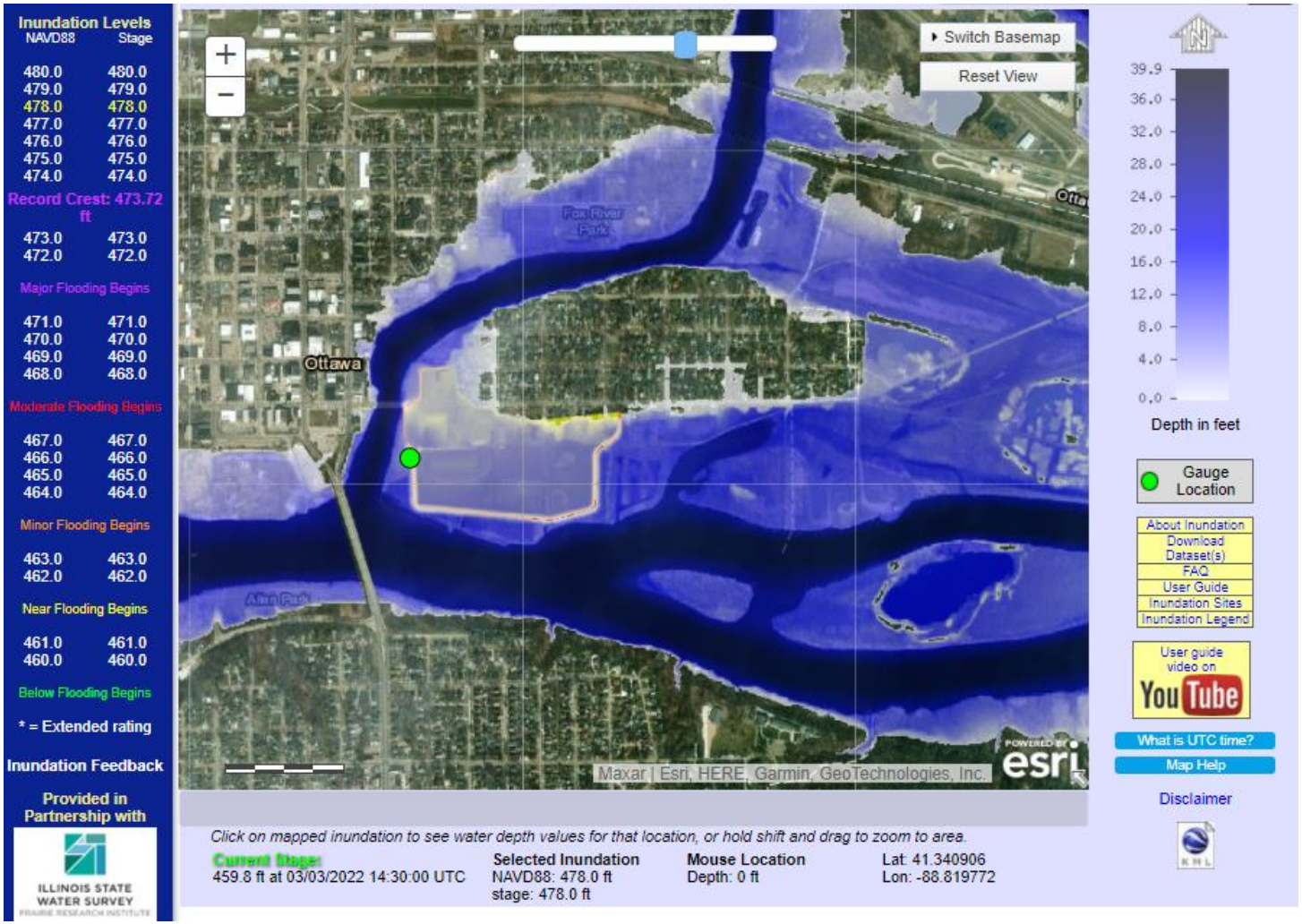


Analysis of Extreme Rainfall Patterns

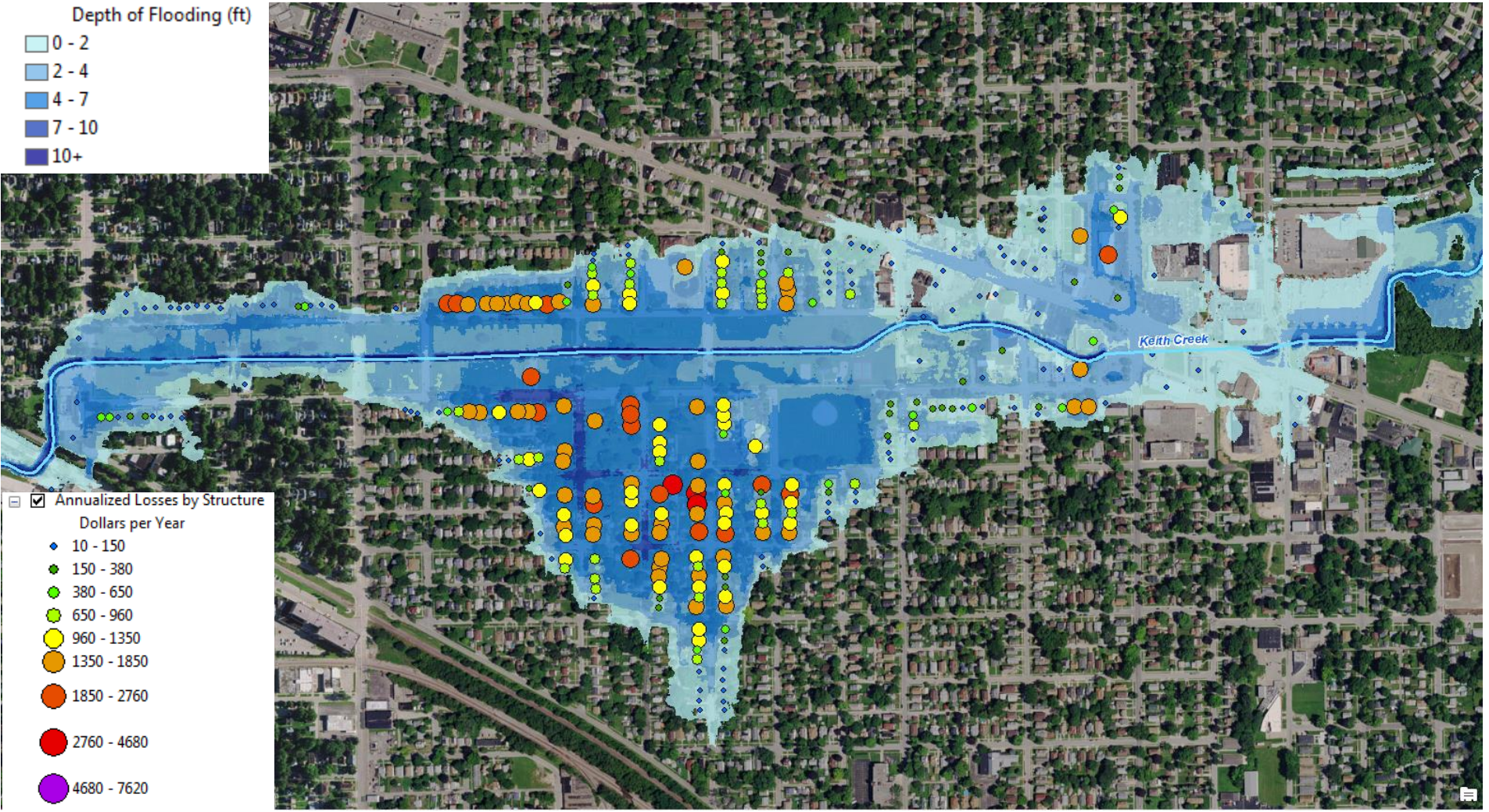




Real-time Flood Forecast Inundation Mapping

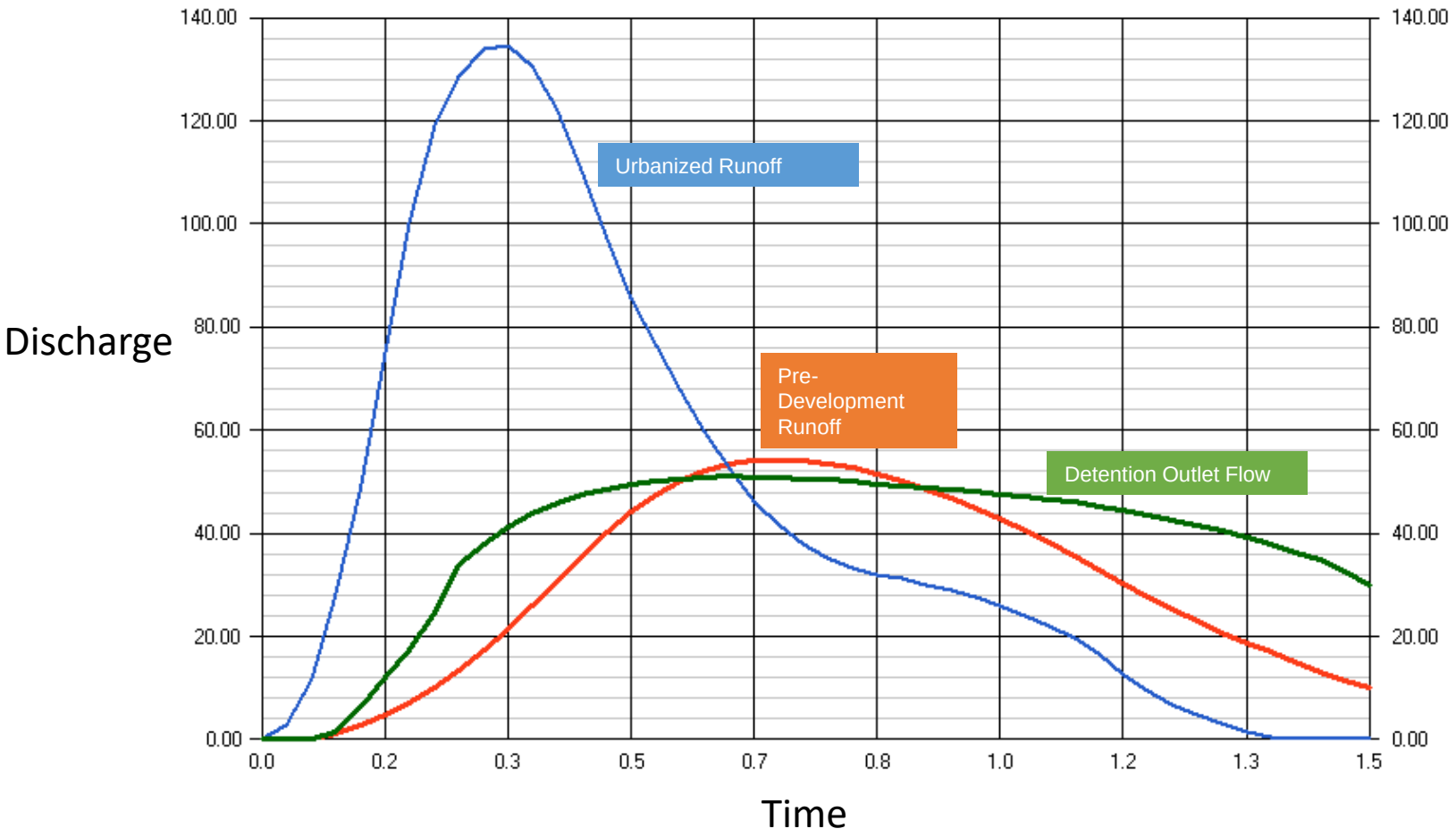


Structure Based Risk Assessments and Hazard Mitigation Planning

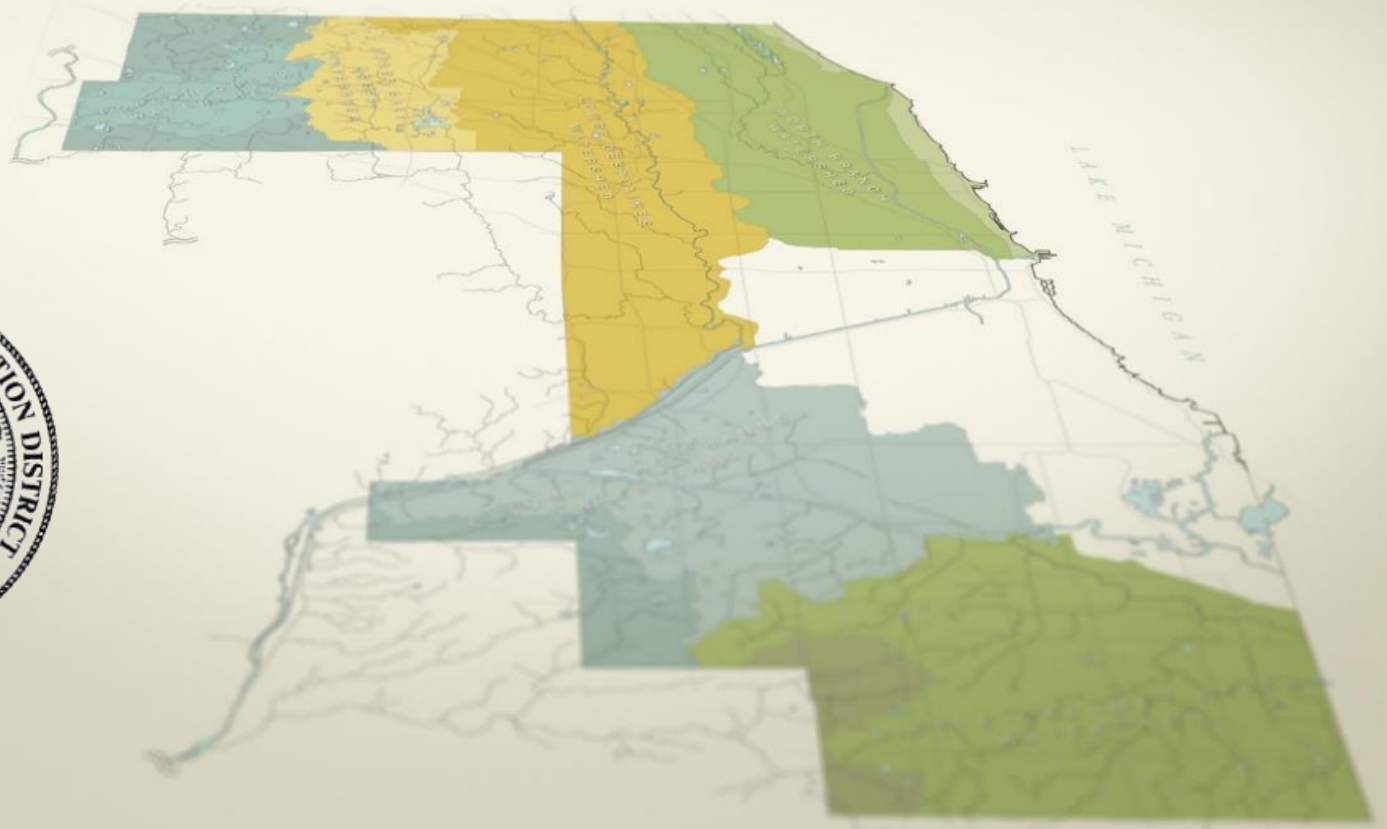


Watershed Specific Release Rate Project Review

Development Impacts on Hydrology



Spatial Extents of Release Rate Analysis



Public Comments on Release Rates

Initial WMO Ordinance Draft Prior to 2014

- Initially: 0.30 cfs/ac, decreasing to 0.15 cfs/ac after 5-years
- Provides transition period to 0.15 cfs/acre

Selected Comments:

- “Serious concerns over the potential negative impacts to development and redevelopment due to increased cost”
- “Reasonable compromise”
- “This will put Cook County at a competitive disadvantage”
- “Make no further compromises on release rates”
- “Water quality and erosion control must improve, proper release rates based on science are a critical part of the WMO”

Project Goal

Article 5. Requirement for Stormwater Management, Section 504: Site Detention Requirements

3. The **allowable release rate** for a **development** shall be determined at the time a complete **Watershed Management Permit** application is accepted by the **District** and shall be:

   A. 0.30 cfs/acre of **development** for the **storm event** having a one percent probability of being equaled or exceeded in a given year (100-year **storm event**) until April 30, 2019; and

   B. Based on a **watershed** specific release rate after and including May 1, 2019 as specified in Appendix B. The **watershed** specific release rate shall not be less than 0.15 cfs/acre of **development**.

Project Objective

Release rate selection objective:
Determine regulatory release rates that mitigate the impacts of development by maintaining the 1% annual-chance flood event elevations at or below current levels.

Watershed Specific Release Rate Study

Phase 1
- Develop Methodology
- Base and Future Conditions Modeling:
- Pilot Watersheds

Phase 1
- Sensitivity Analysis, Parameter Selection
- Methodology Recommendation

Phase 2
- Base and Future Conditions Modeling:
- 6 MWRD Watershed Planning Areas

Phase 2
- Review and analyze results
- Present results to TAC for review and comment

Phase 2
- Prepare and Deliver Final Report and model documentation

Phase 3
- Expand study to include:
- DIA Impacts
- Water Quality
- Collar County Impacts

Technical Advisory Committee Meetings

Date	Meeting Purpose
November 4, 2015	Proposed Methodology Overview, Pilot Watershed Analysis, QA of Base Conditions Models, Regional Project Incorporation
July 19, 2016	Review of Methodology, Sensitivity Analyses, Analysis Metrics, Land Use Development, Factors that Impact Release Rate Selection, Draft Results for Pilot Watersheds
January 17, 2018	Pilot Watershed Results, Watershed Extents to be Studied, LEAM Analysis
May 9, 2018	Selected Future Development Levels, Watershed Planning Area Modeling Status
December 12, 2018	Reviewed study results

Watershed Management Using Watershed Specific Release Rates

The Northeastern Illinois Planning Council Study, 1991

- **Recommendations**
  - Stormwater detention volume should be computed using a hydrograph method
  - The modified rational method should not be used for stormwater detention design
  - Bulletin-70 rainfall data should be used
  - Release rates should limit stormwater discharges:
    - 2-year release rate of 0.04 cfs/acre
    - 100-year release rate of 0.15 cfs/acre
  - A larger watershed should be studied

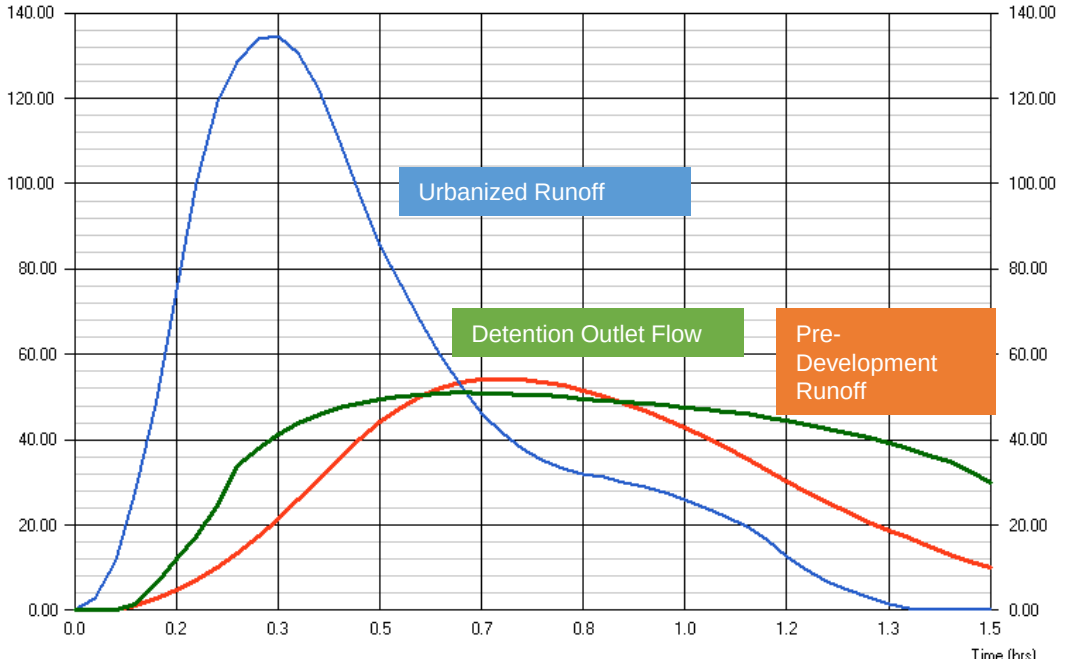
Collar County Release Rates
(100-Year Detention Requirements)

County	Release Rate (cfs/acre)	Methodology	Original Adoption Date
Lake	0.15	Hydrograph	10/18/1992
McHenry	0.15	Hydrograph	1/20/2004
Will	0.15	Hydrograph & Modified Rational Method	1/1/2004
DuPage	0.10	Hydrograph	9/24/1991

Development impact on hydrology

Factors determining the effectiveness of a watershed specific release rate:

1. Release rate compared to existing runoff rate
2. Watershed timing
3. Increased runoff volume / restrictive structures



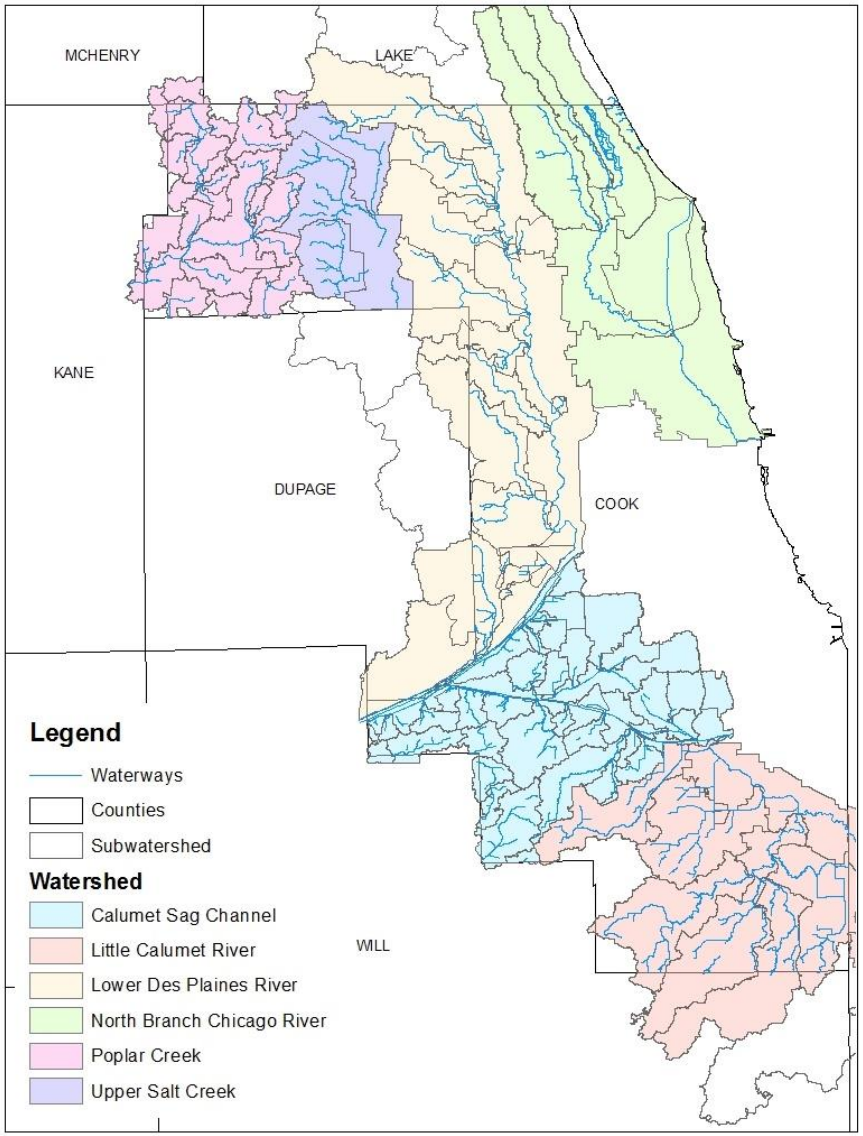
Methodology

Methodology

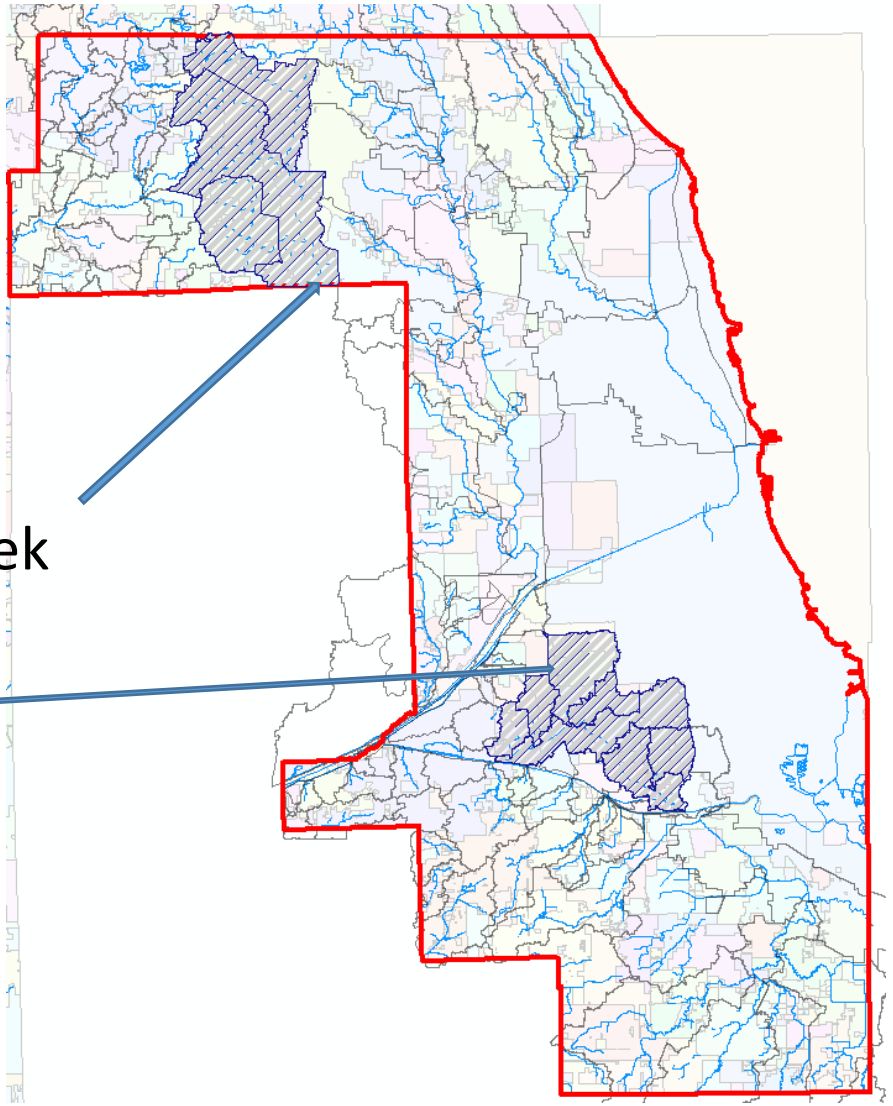
- Phase I
  - Evaluate two pilot study areas
  - Develop streamlined methodology and set of assumptions
  - Evaluate release rates for pilot study areas and garner technical feedback

Phase II

- Apply the methodology developed in Phase I in each Watershed Management Area
- Evaluate release rates for watersheds under WMO regulation



Two Pilot Study Areas



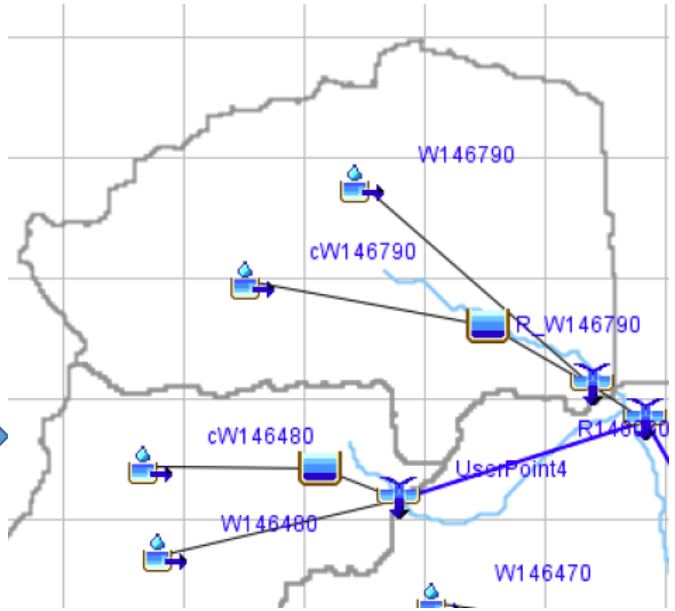
Upper Salt Creek

Stony Creek

Basis of Methodology

Base Condition:
DWP H&H
with some updates

Future Condition:
Increased Development
WMO Requirement



Model Elements

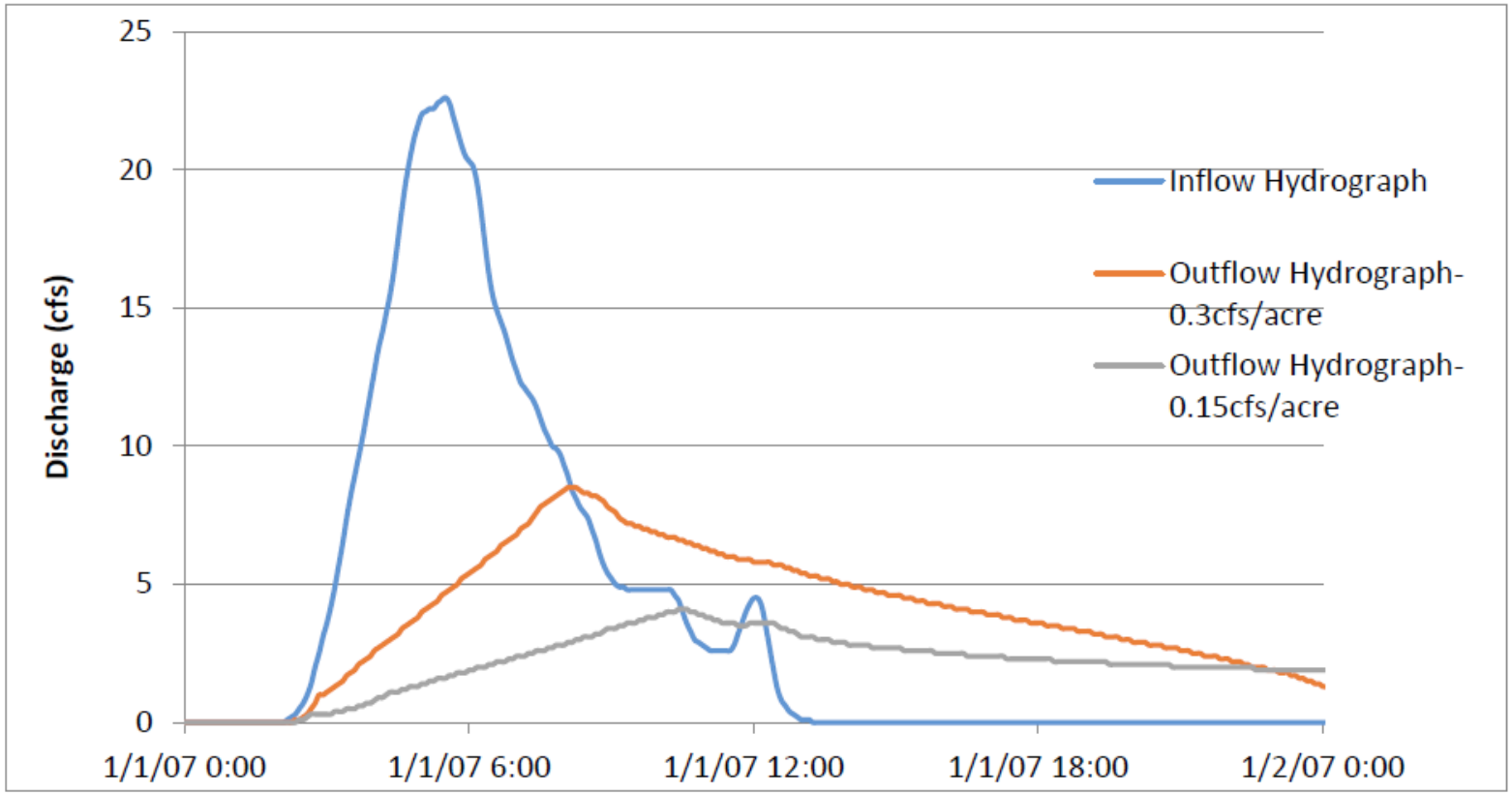
- Watershed
- Subwatershed
- Subbasin

Subwatershed Selection

- Identify key, selection controlling subwatersheds based on Phase 1 results
- Unnecessary to model every last acre

Watershed Specific Release Rate Study

Methodology Overview



Watershed Specific Release Rate Study

Assessing the Methodology

- Evaluate Assumptions & Validate Model
  - Sensitivity to critical duration
  - Sensitivity to future Curve Number selection
  - Sensitivity to transformation parameters
  - Validation of volume control modeling results
  - Validation of future detention volume
  - Validation of future development rates and patterns
- Efficient Application
  - Programming completed to apply future hydrology edits and run hydraulic modeling
  - Map and hydrograph products automated to assist with analysis

Landuse Evolution and impact Assessment Model (LEAM)

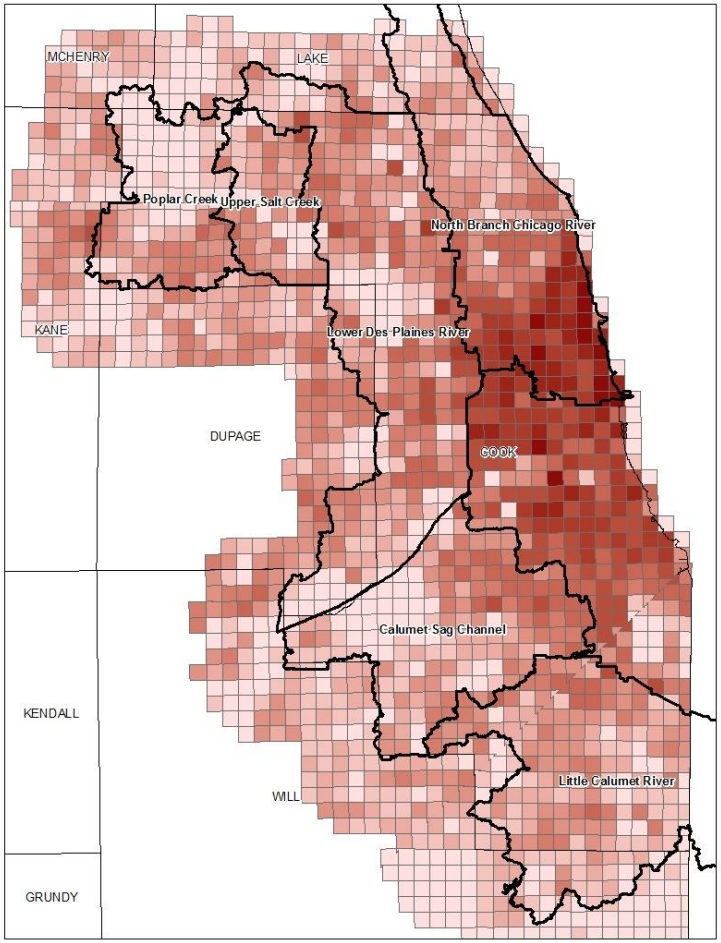
GOTO 2040 Agricultural Preservation Strategies

The University of Illinois at Urbana-Champaign LEAM Laboratory and the Chicago Metropolitan Agency for Planning

October 23, 2008

landuse evolution and impact assessment model HTTP://WWW.LEAM.UIUC.EDU

2050 Population Projection (in households)



Selected Methodology

- **Base Model**
  - DWP Unsteady State HEC-HMS and HEC-RAS Models, analyzed at critical duration
- **Future Development**
  - Uniform 40% Development/Redevelopment Meeting the WMO (with adjustments for preserve lands)
- **Detention**
  - Modeled reservoirs meeting various Watershed Release Rates for the 100-year 24-hour storm with separate control volume
- **Release Rate**
  - 0.15, 0.2, 0.25, and 0.3 cfs/acre were analyzed

- Updated for recent major stormwater projects
- Uniform development was selected to evaluate release rates. 40% was supported by land use change analysis
- Linear hydrograph modeled with storage-discharge functions.
- Outside of the WMO regulatory area the release rate of the adjoining jurisdiction was applied

Analysis of Release Rates

Watershed Specific Release Rate Analysis: *Calumet Sag Watershed*

Base Model Summary

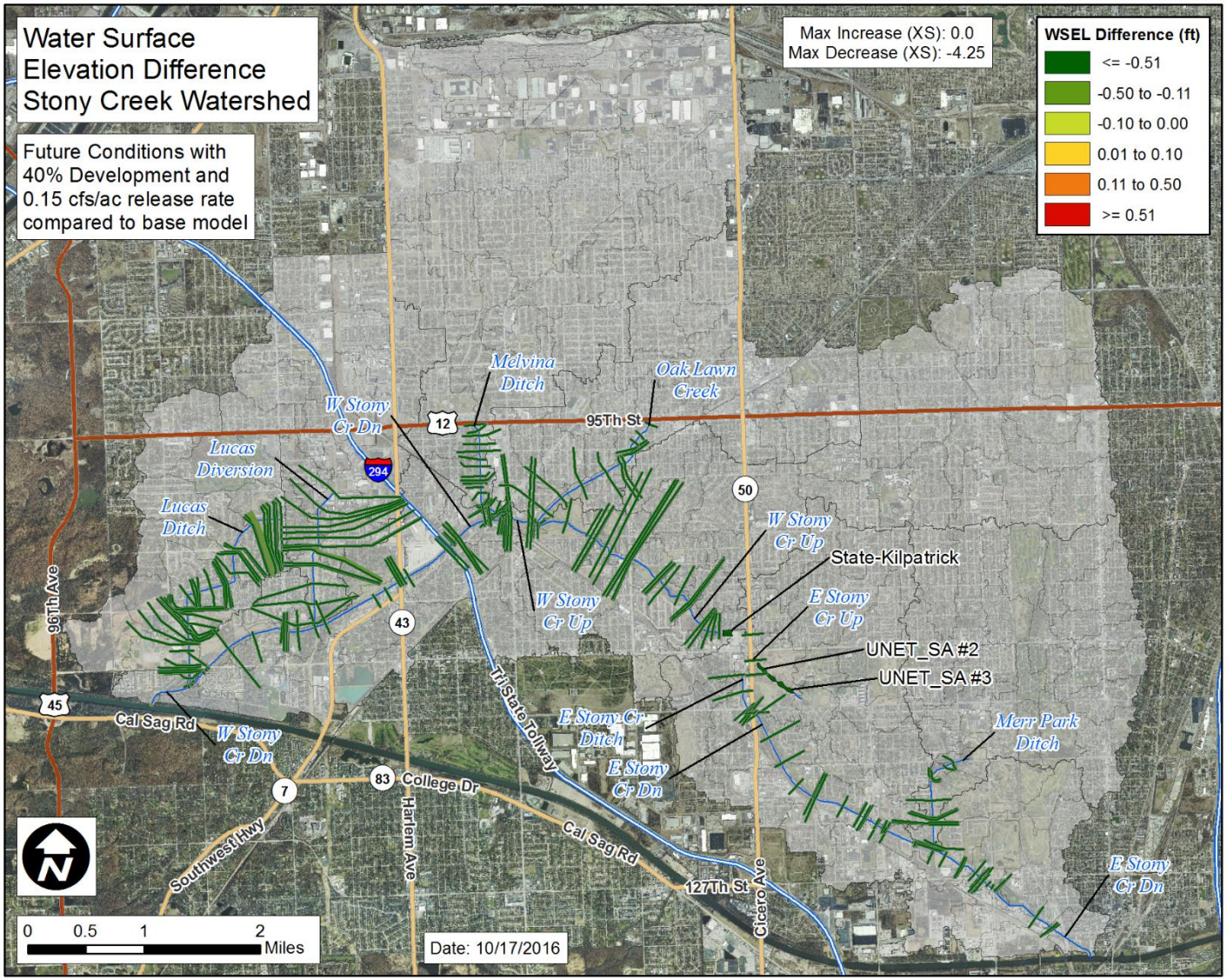
Modeled Subwatersheds

- Tinley Creek
- Stony Creek

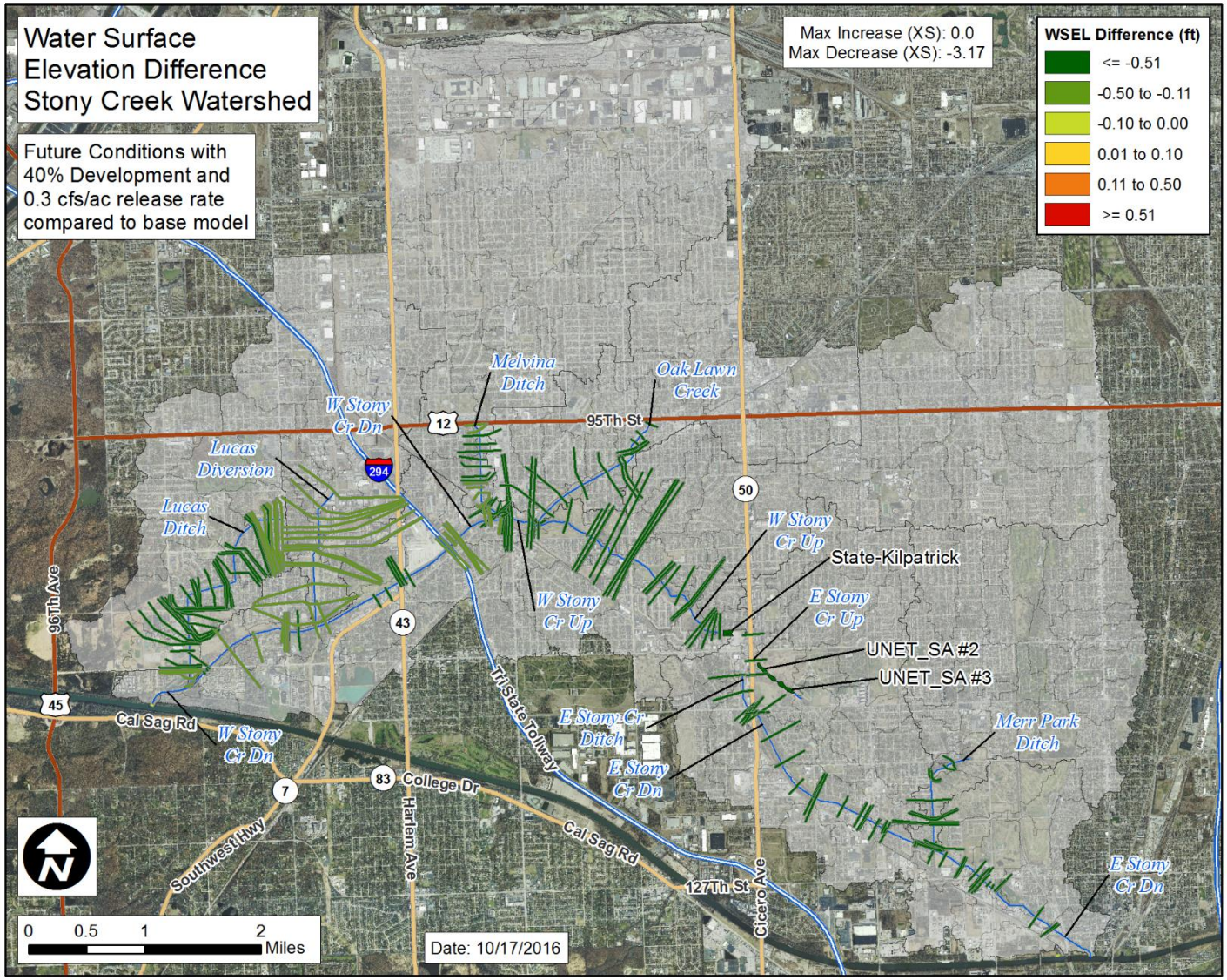
Base Runoff Rates

		Critical duration		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
Calumet Sag	Stony Creek	0.69	0.35 - 0.94	12hr
	Lucas Ditch	0.66	0.45 - 0.80	12hr
	Lucas Diversion Ditch	0.77	0.62 - 0.93	12hr
	Melvina Ditch	0.77	0.64 - 0.97	12hr
	Merr Park Ditch	0.73	0.63 - 0.85	12hr
	Oak Lawn	0.78	0.62 - 0.87	12hr
	Tinley Creek	0.72	0.57 - 1.00	12hr

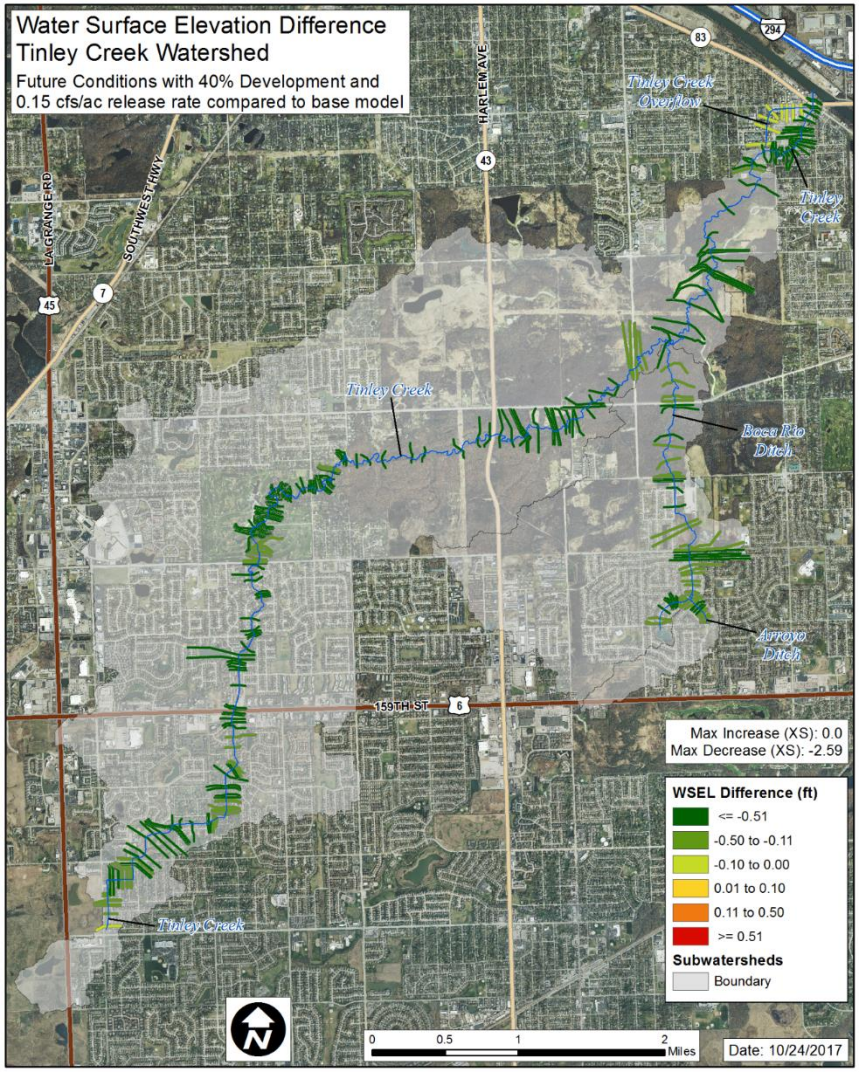
Future Model Results

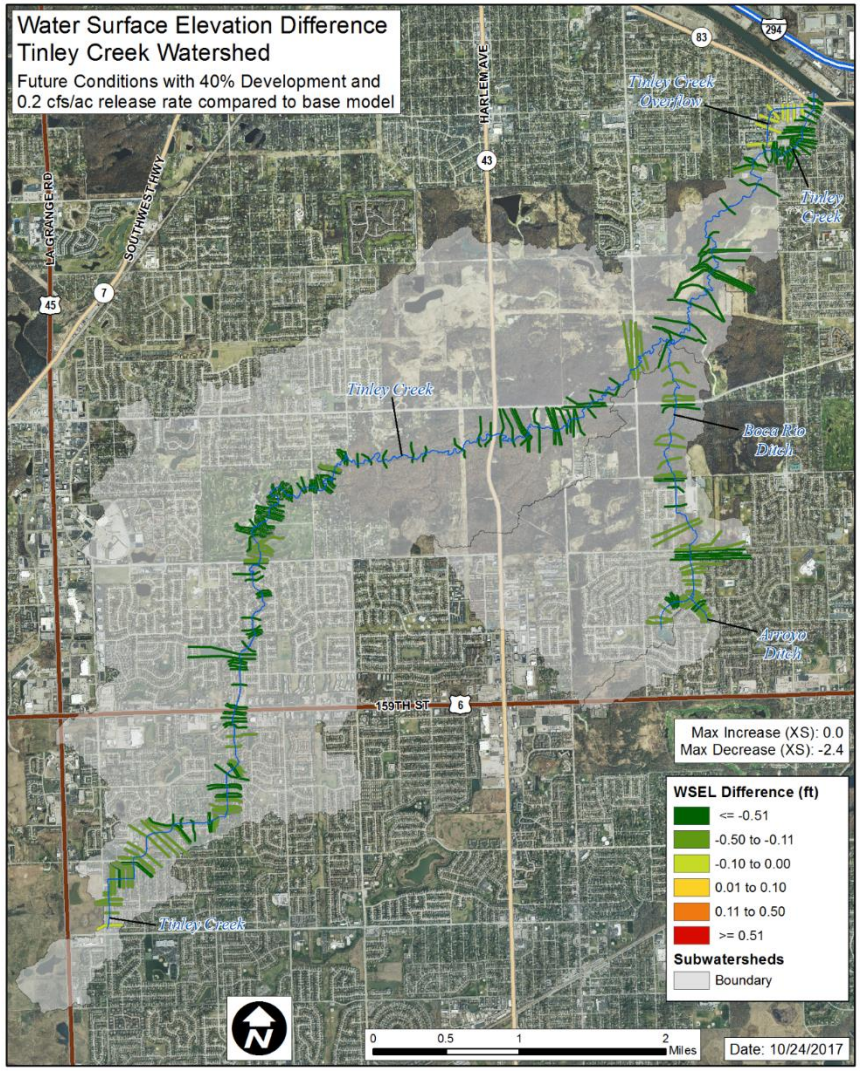


Future Model Results

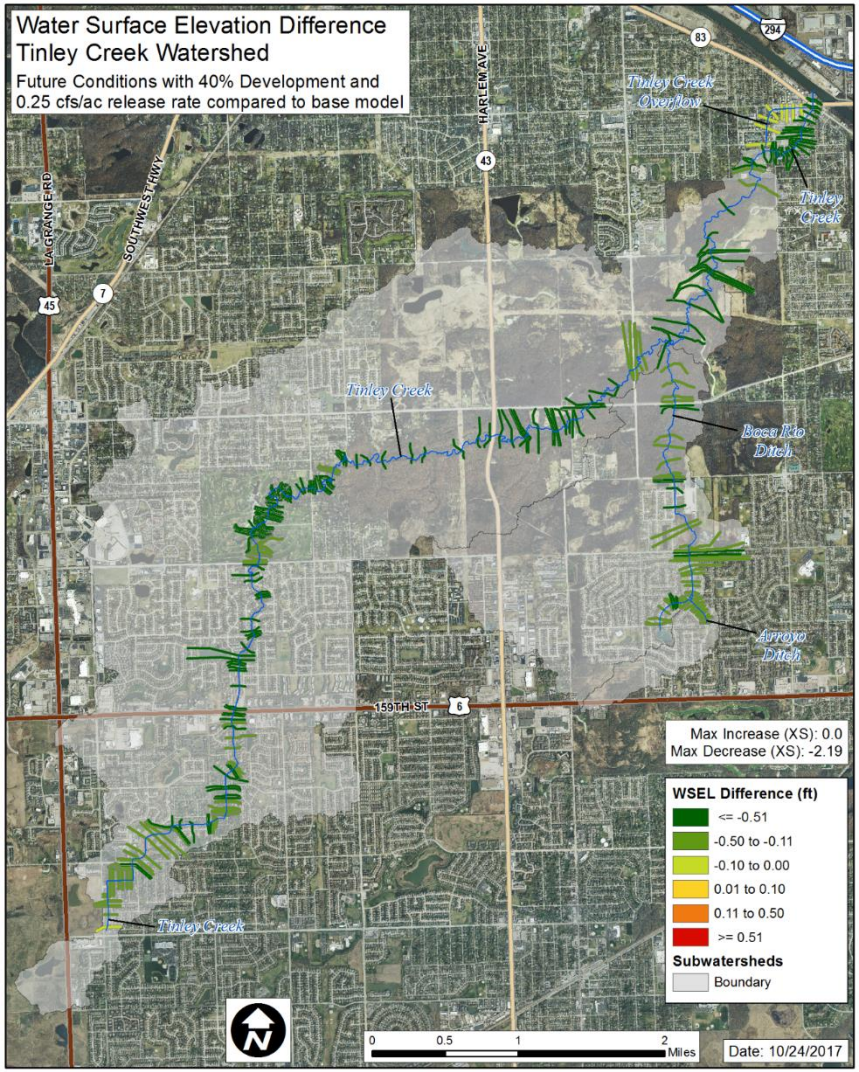


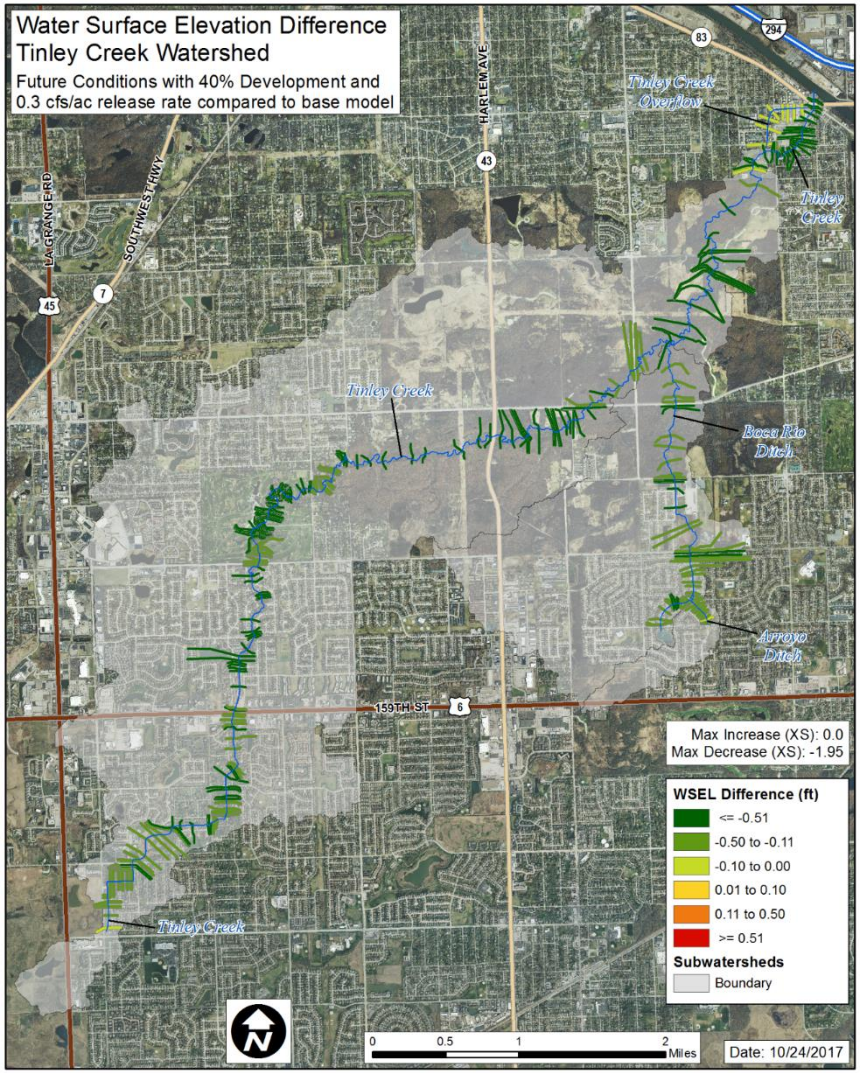
Future Model Results





Future Model Results





Analysis of Effect of Release Rates

Stony Creek Subwatershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	0	75,359
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

Tinley Creek Subwatershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	0	90,668
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

Watershed Specific Release Rate Analysis: *North Branch Chicago River Watershed*

Base Model Summary

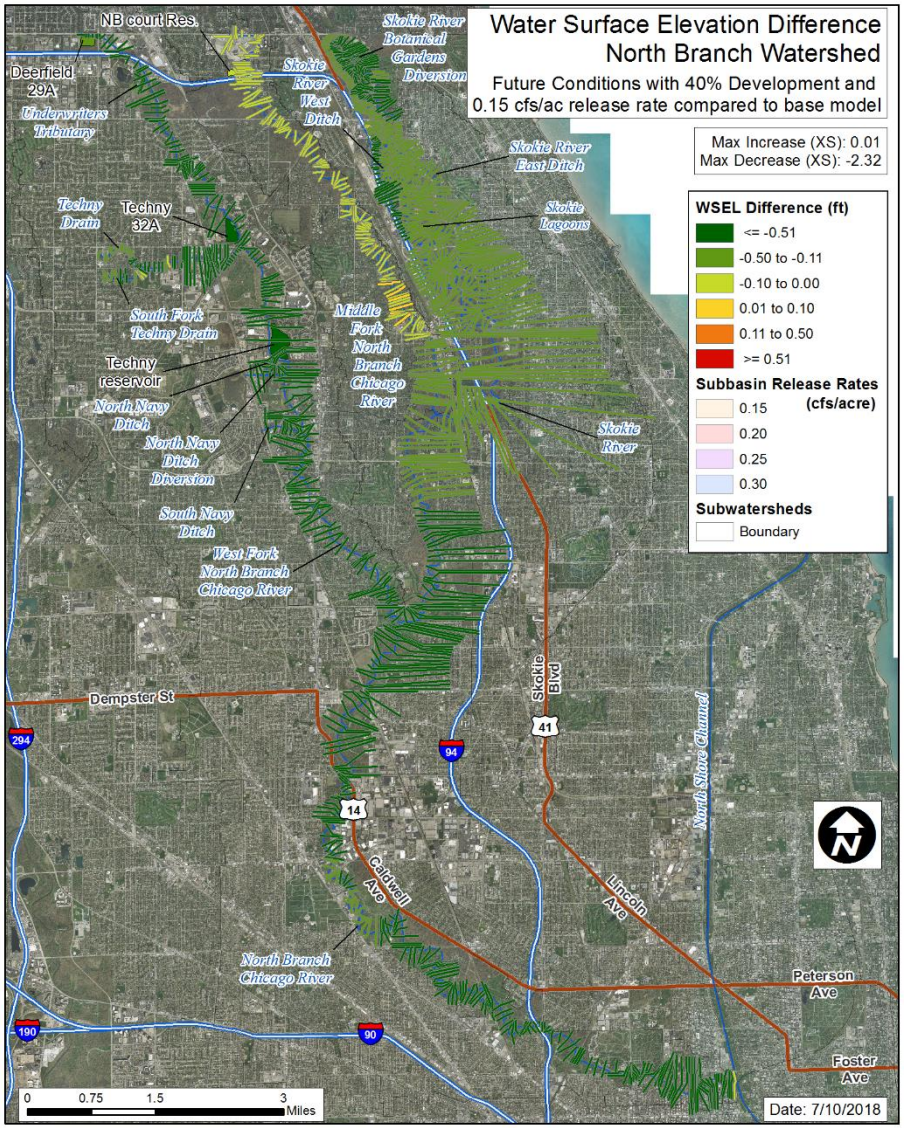
Modeled Subwatersheds:

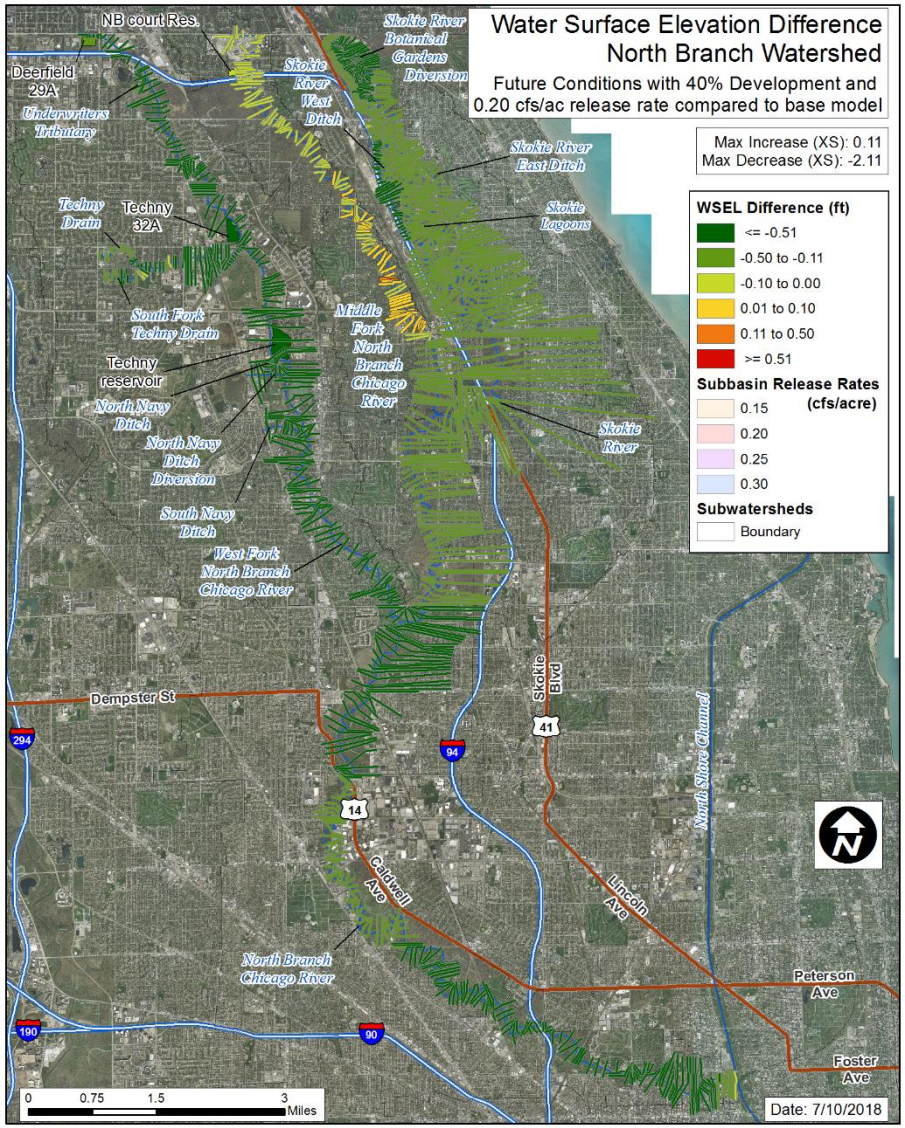
- North Branch Chicago River (Upstream of North Shore Channel)
- West Fork North Branch Chicago River
- Middle Fork North Branch Chicago River
- Skokie River

Base Runoff Rates

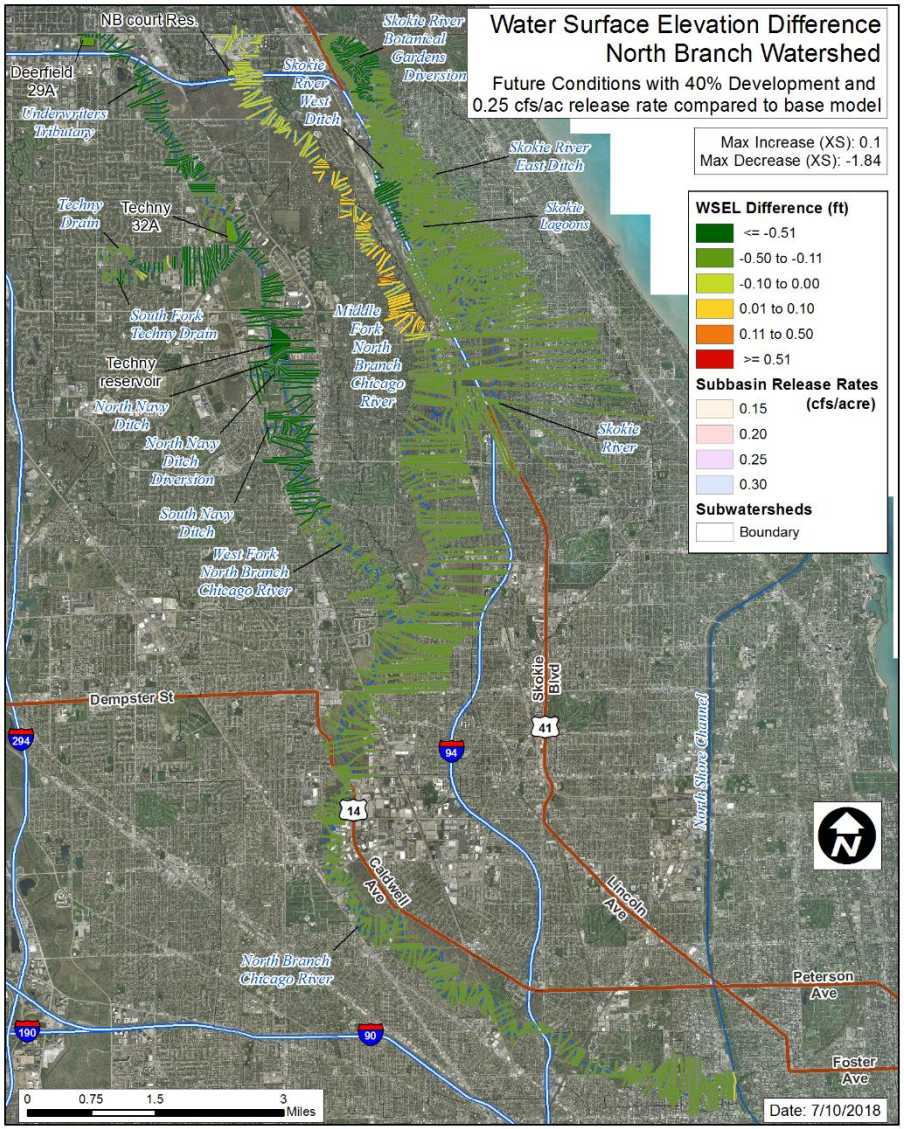
		24 hour		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
North Branch Chicago River	West Fork	0.41	0.21 - 0.76	24 hr
	Middle Fork	0.32	0.13 - 0.59	24 hr
	Skokie	0.27	0.12 - 0.62	24 hr
	North Branch US	0.32	0.17 - 0.51	24 hr

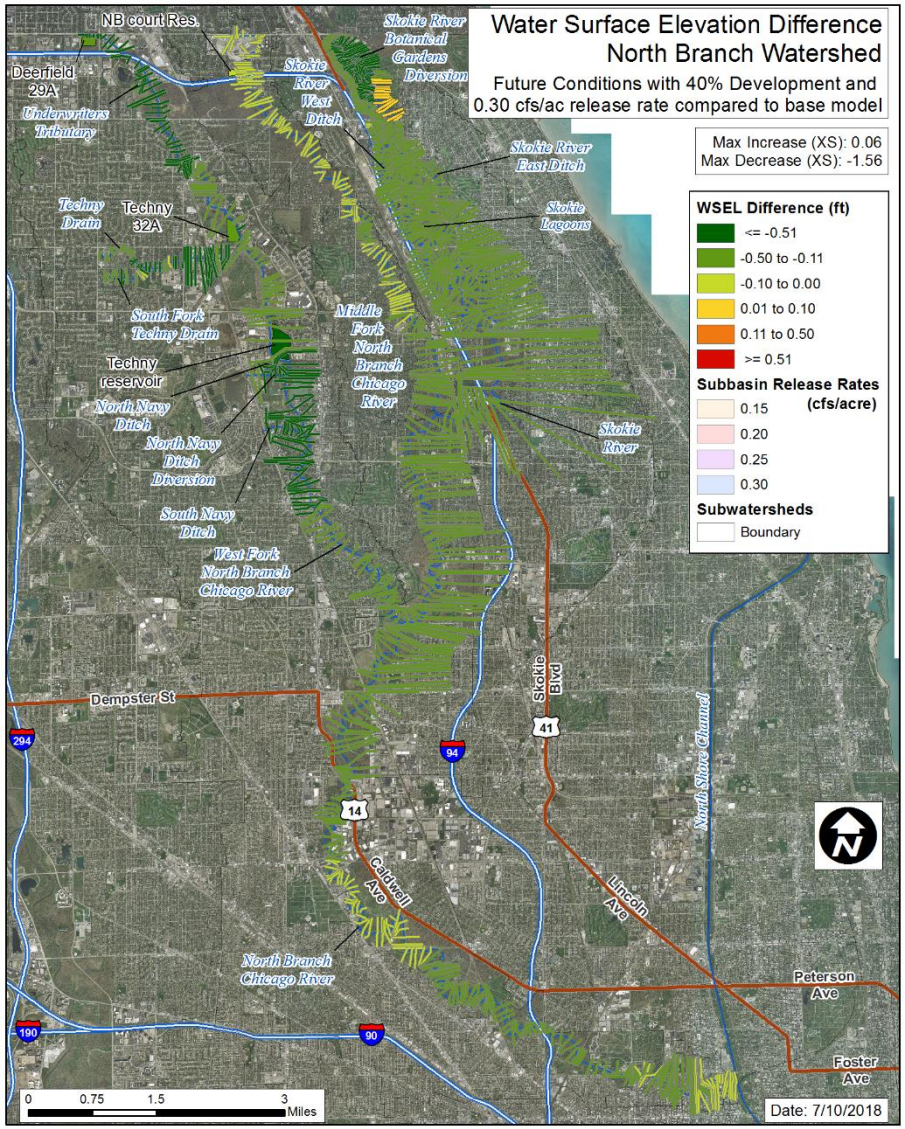
Future Model Results





Future Model Results





Analysis of Effect of Release Rates

North Branch Chicago River Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	108	108	0	286,663
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

Watershed Specific Release Rate Analysis: *Poplar Creek Watershed*

Base Model Summary

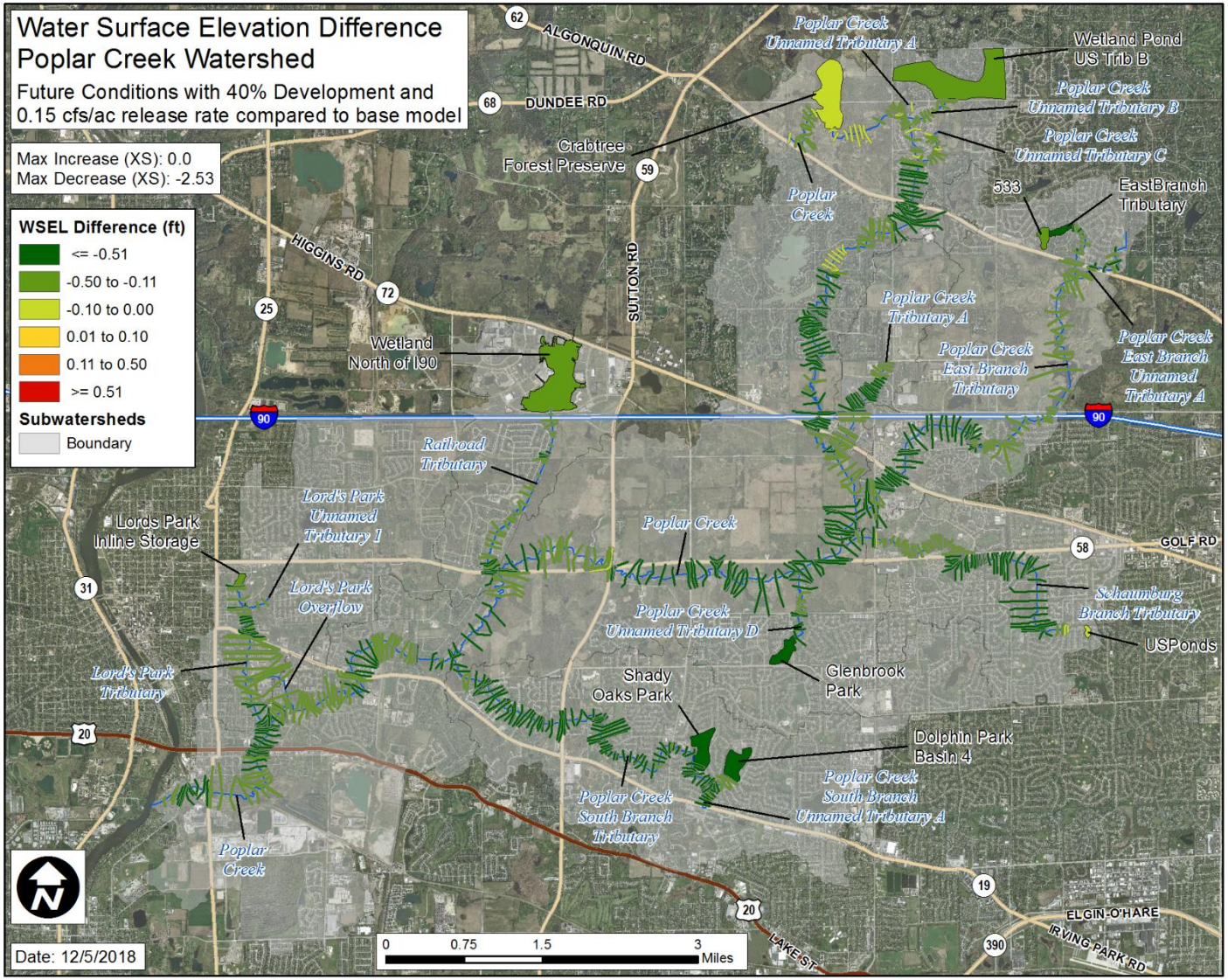
Modeled Subwatersheds:

- Poplar Creek
- Poplar Creek South Branch
- Poplar Creek Lord's Park Tributary
- Poplar Creek Railroad Tributary
- Poplar Creek Schaumburg Branch
- Poplar Creek East Branch
- Poplar Creek Tributary A

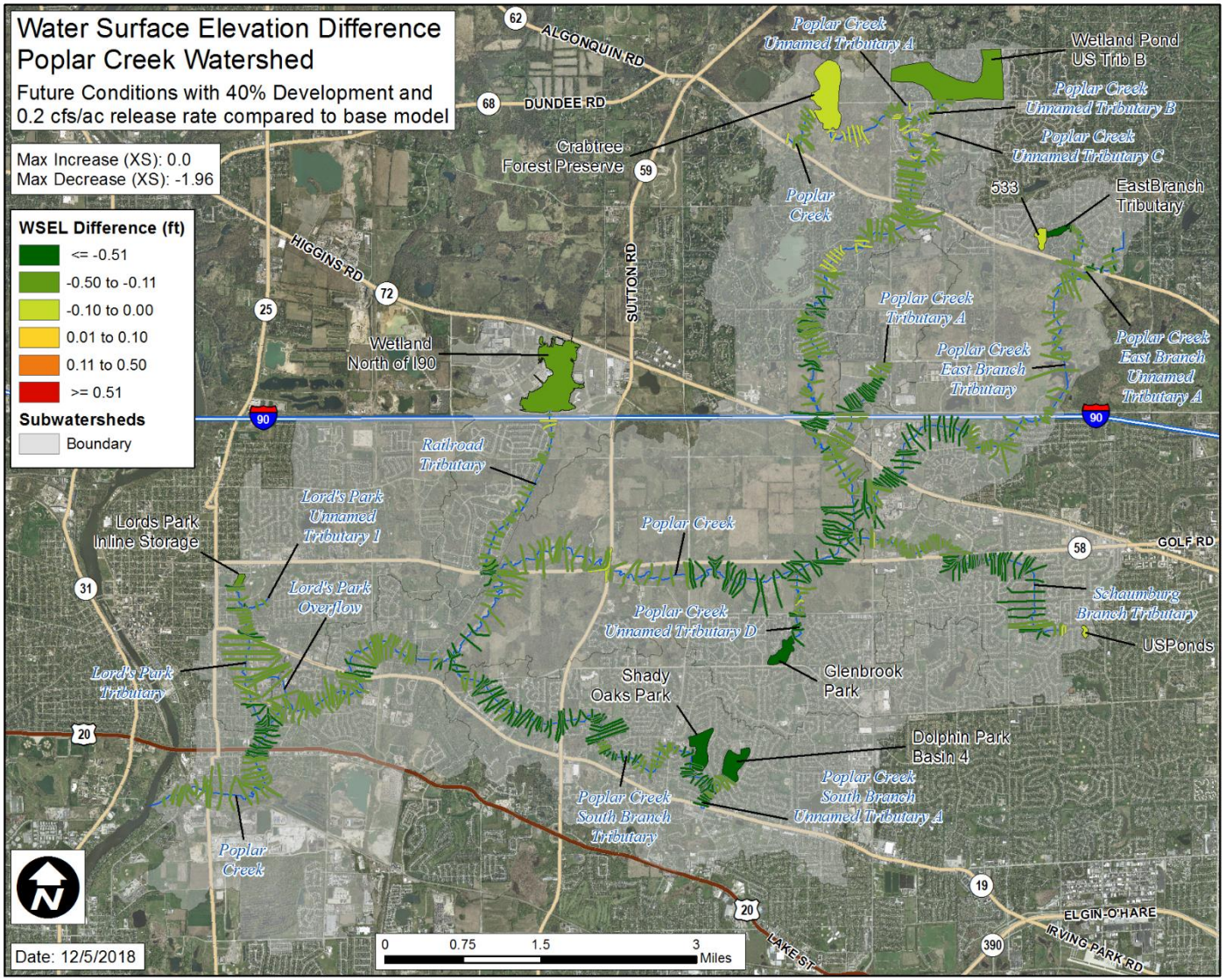
Base Runoff Rates

		24 hour		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
Poplar Creek	Tributary A	0.43	0.27 - 0.73	24 hr
	East Branch	0.44	0.22 - 0.67	24 hr
	Schaumburg	0.55	0.38 - 0.74	24 hr
	Railroad Tributary	0.35	0.27 - 0.71	24 hr
	South Branch	0.49	0.24 - 0.75	24 hr
	Lord's Park Tributary	0.39	0.29 - 0.71	24 hr
	Main stem Poplar Creek	0.37	0.14 - 0.67	24 hr

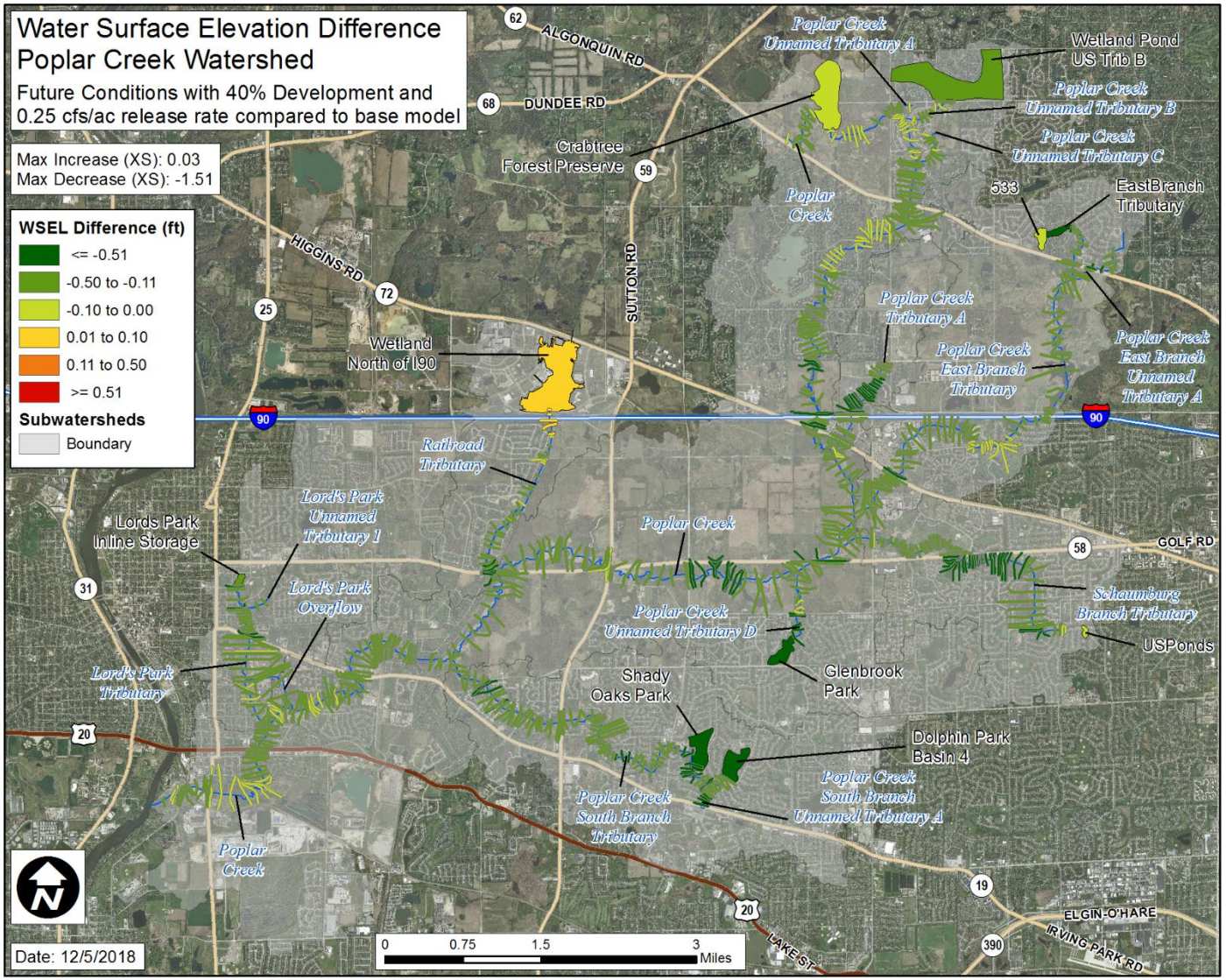
Future Model Results



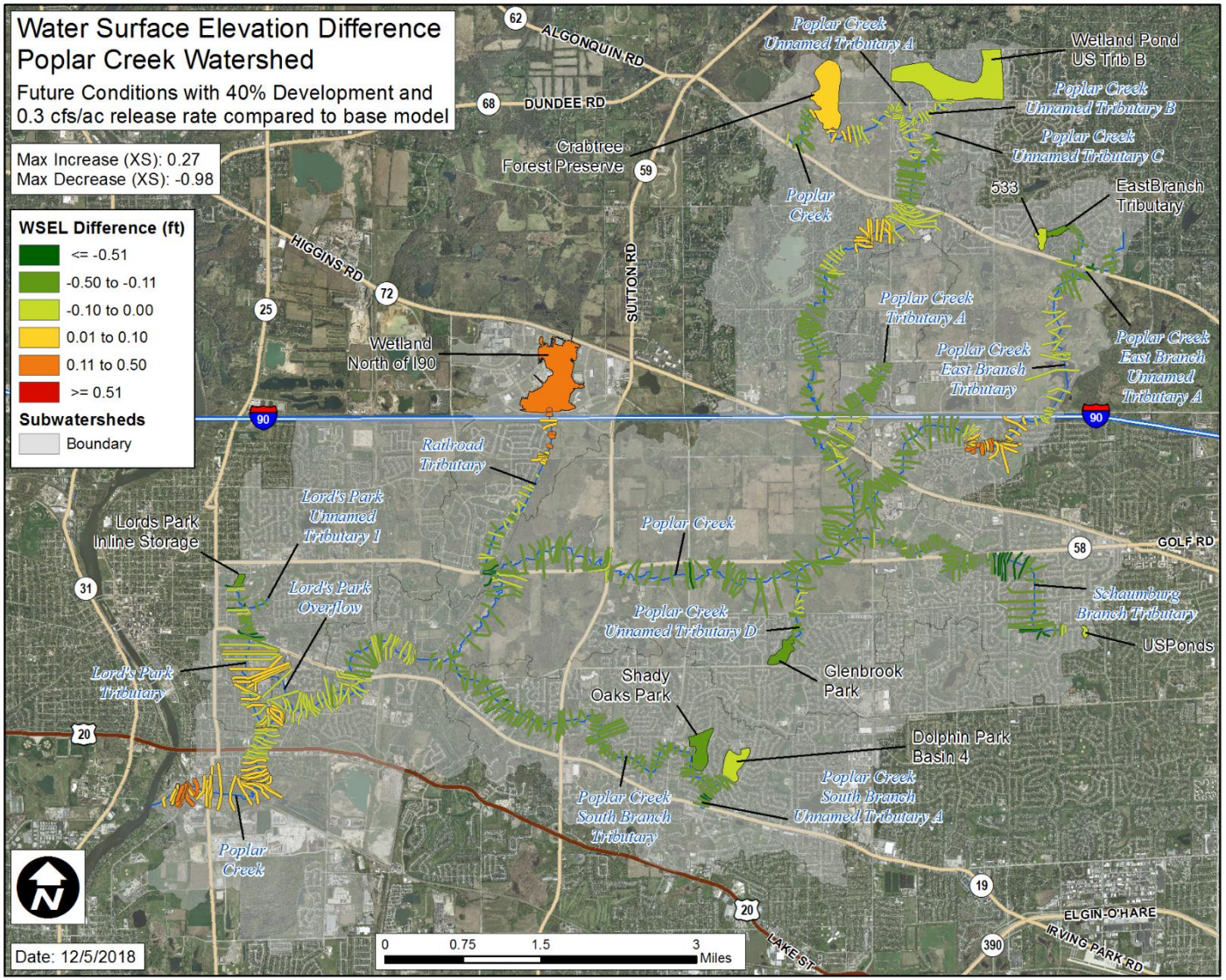
Future Model Results



Future Model Results



Future Model Results



Analysis of Effect of Release Rates

Poplar Creek Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	2,448	203,498
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	1.2%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

Watershed Specific Release Rate Analysis: *Little Calumet River Watershed*

Base Model Summary

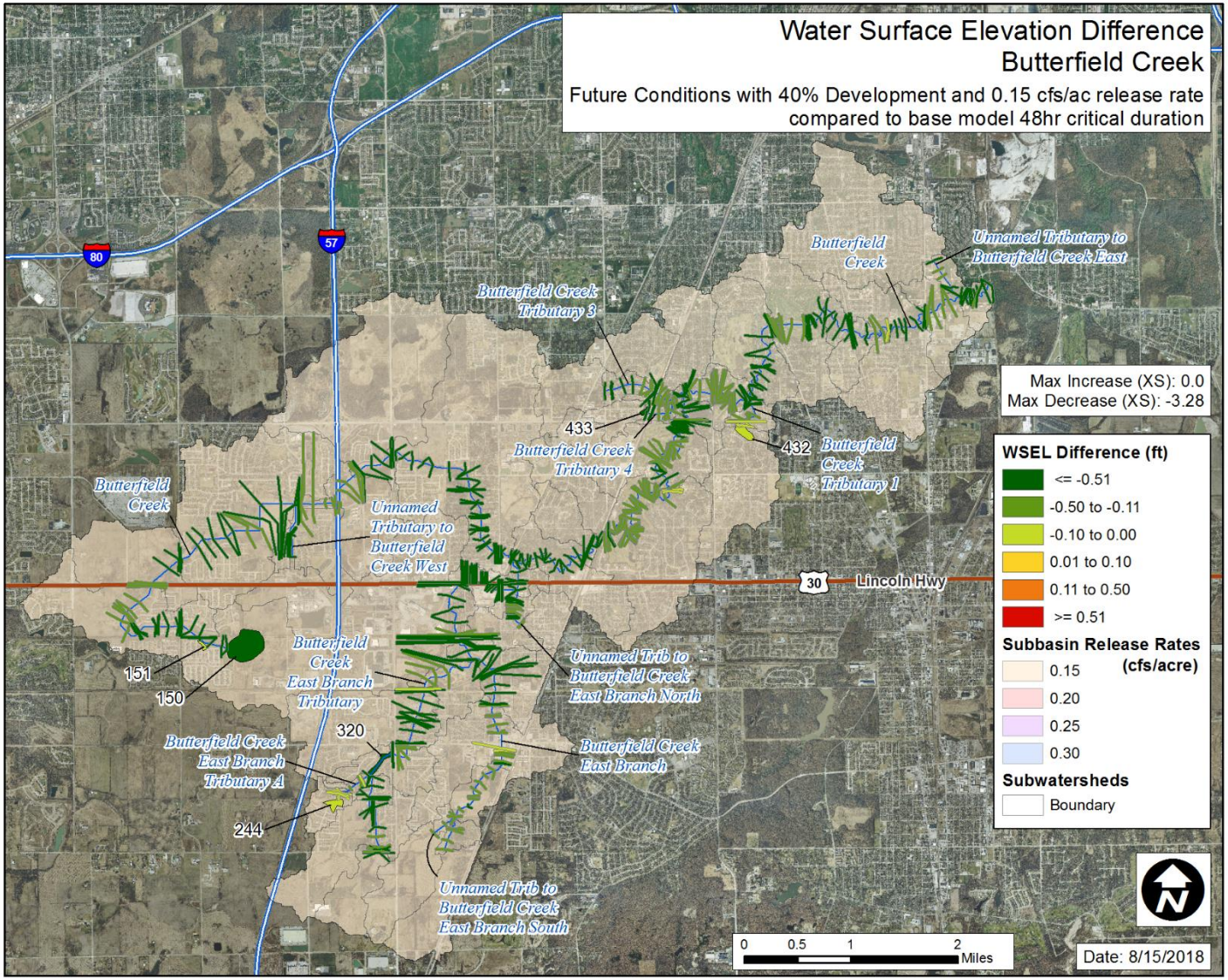
Modeled Subwatersheds:

- Butterfield Creek
- North Creek

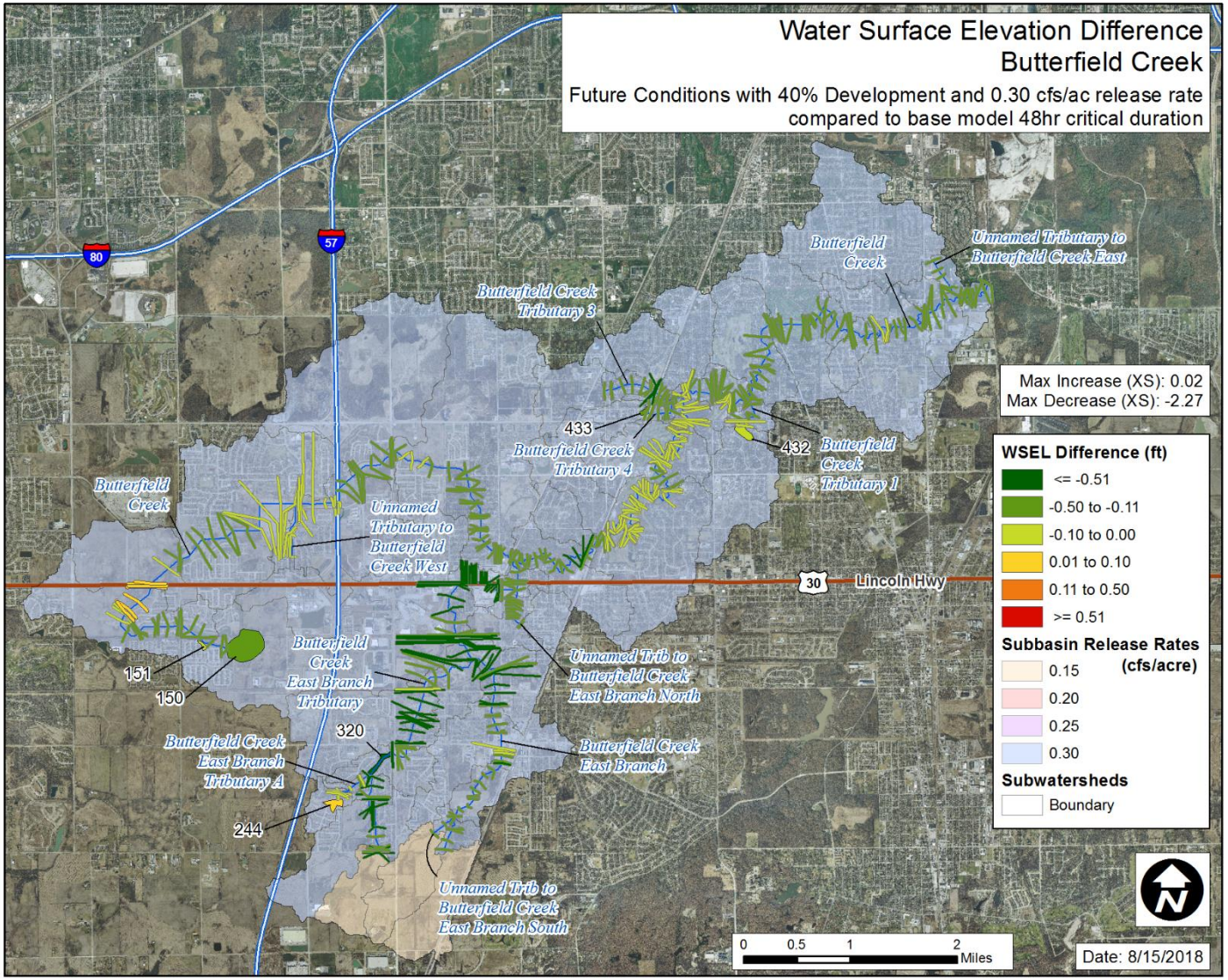
Base Runoff Rates

		Critical duration		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
Little Calumet	Butterfield Creek	0.43	0.30 - 0.64	48 hr
	North Creek	0.35	0.20 - 0.52	48 hr

Future Model Results



Future Model Results



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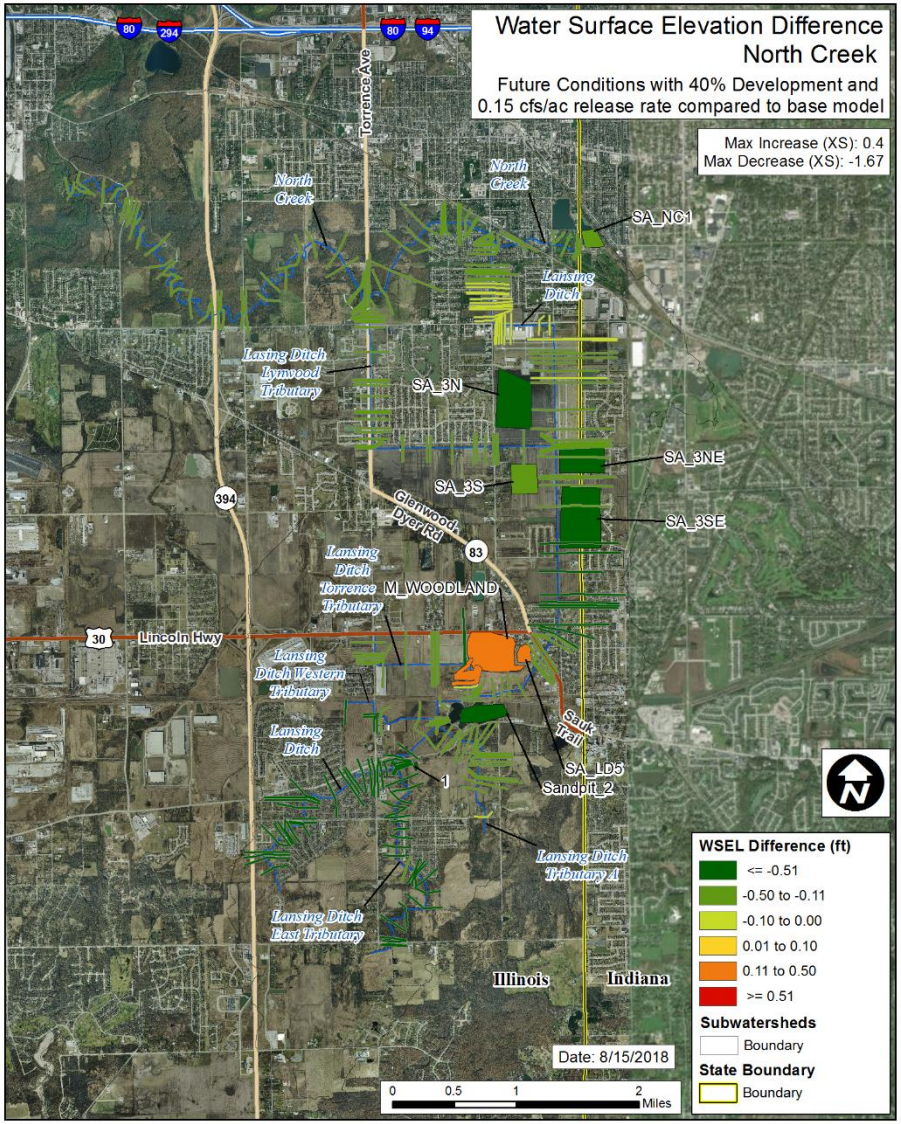

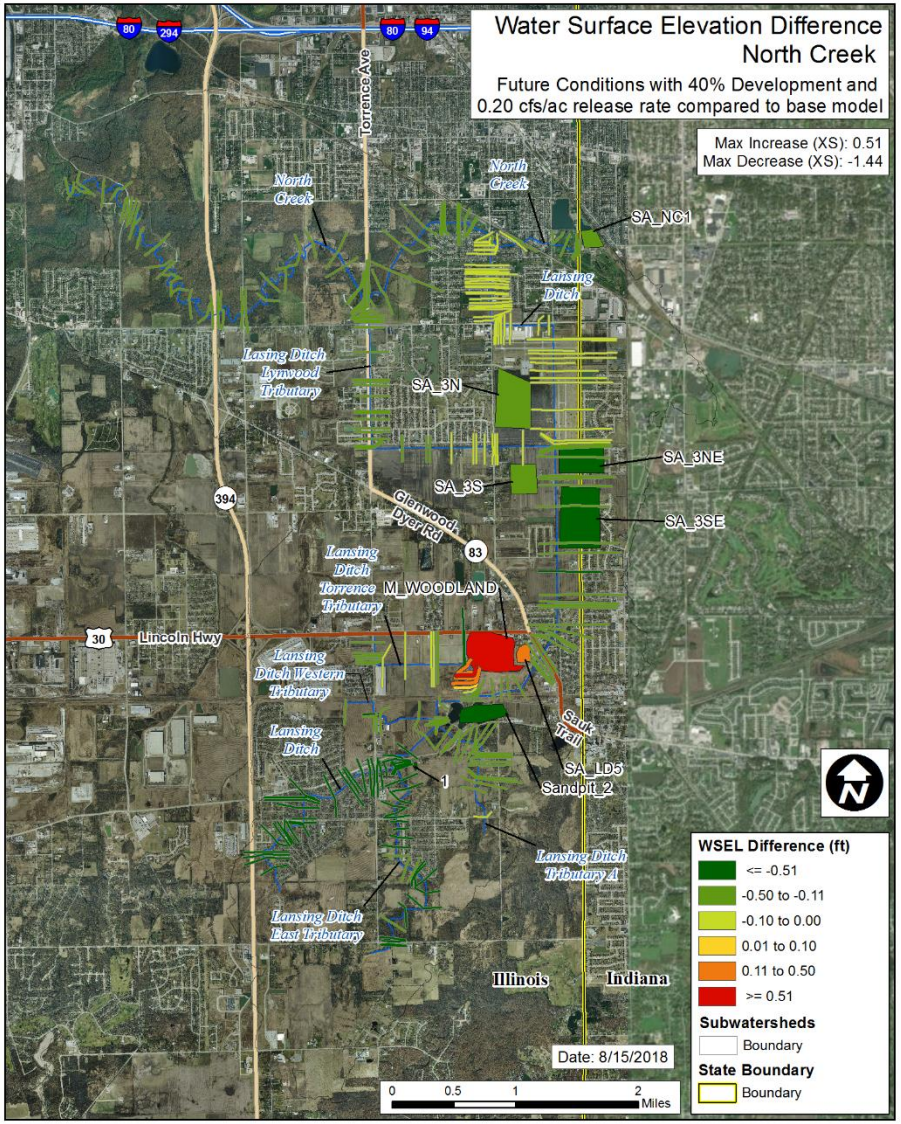

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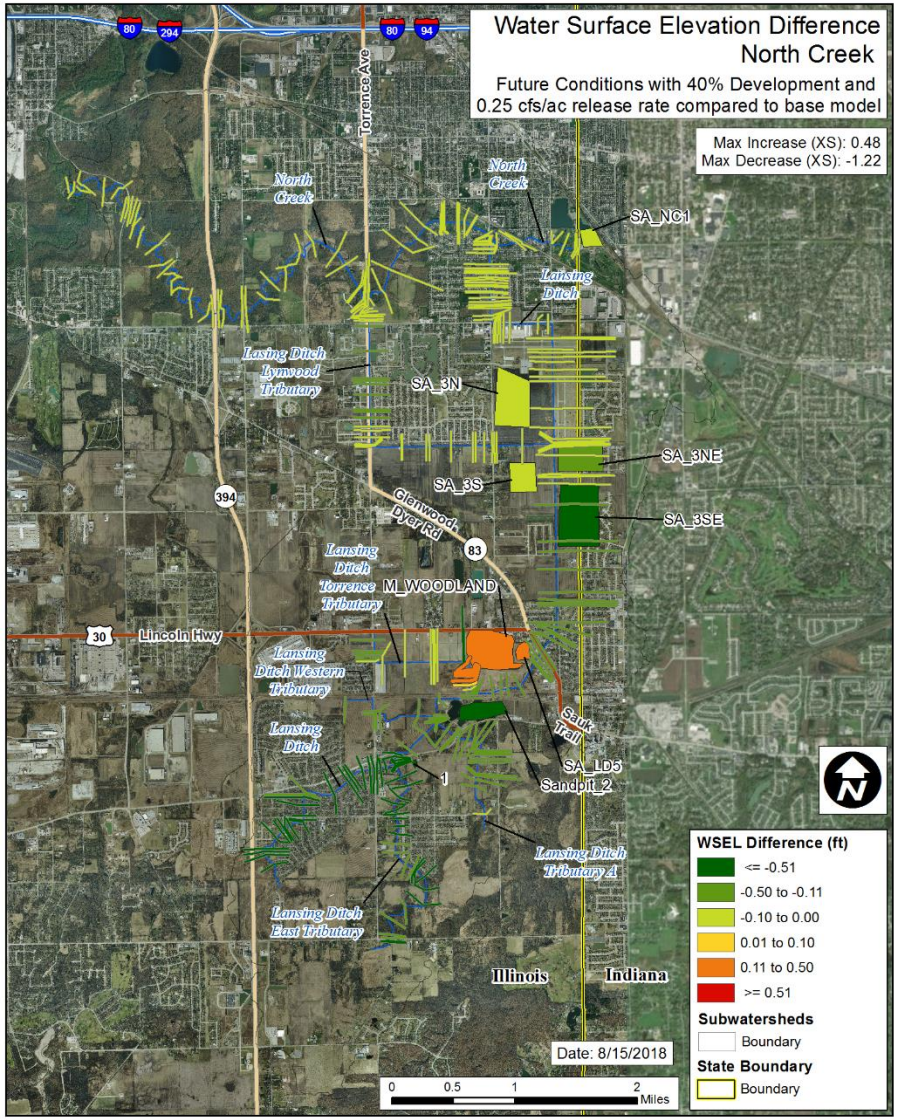
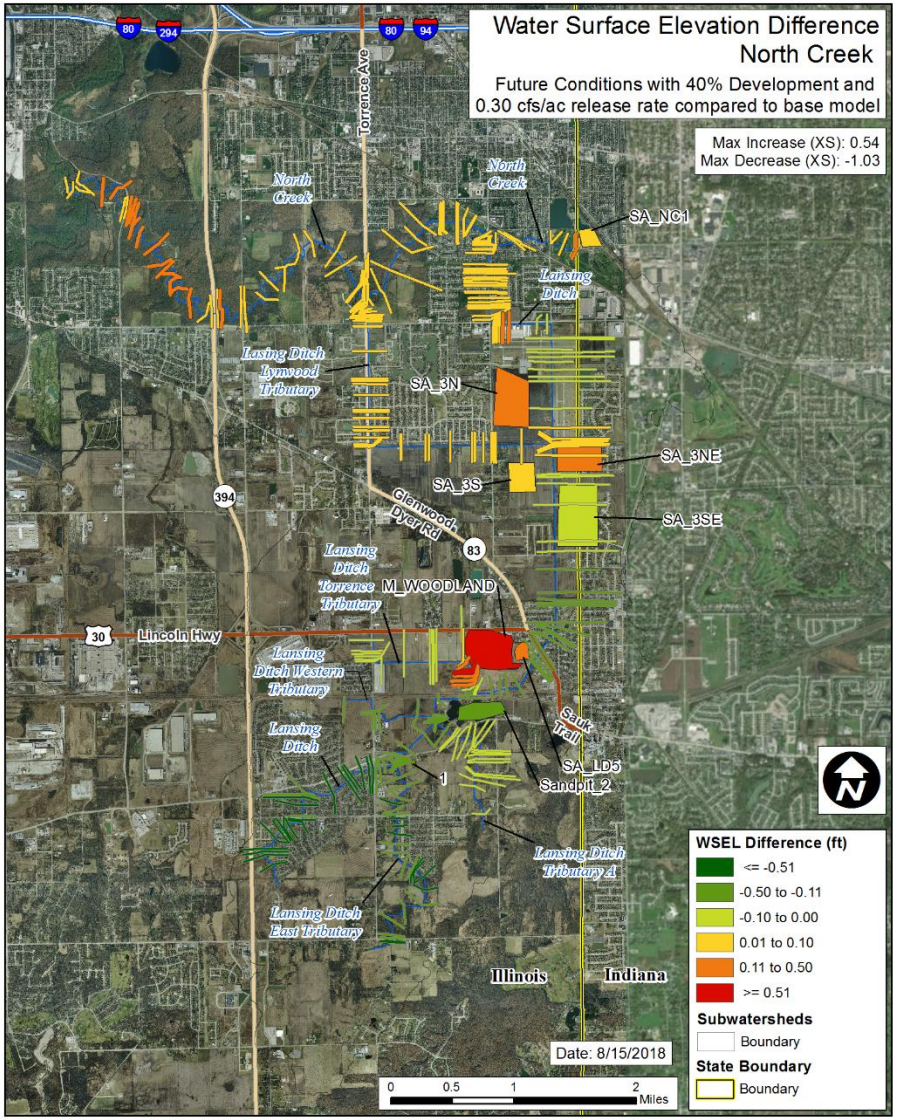




Analysis of Effect of Release Rates

Butterfield Creek Subwatershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	0	136,447
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

North Creek Subwatershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	1,066	1,066	1,066	10,796	120,272
	Stream length with increase in peak WSEl> 0.1’ (%)	0.9%	0.9%	0.9%	9.0%	
	Reservoirs in RAS model with increases > 0.5'	0	1	0	1	

Watershed Specific Release Rate Analysis: *Upper Salt Creek Watershed*

Base Model Summary

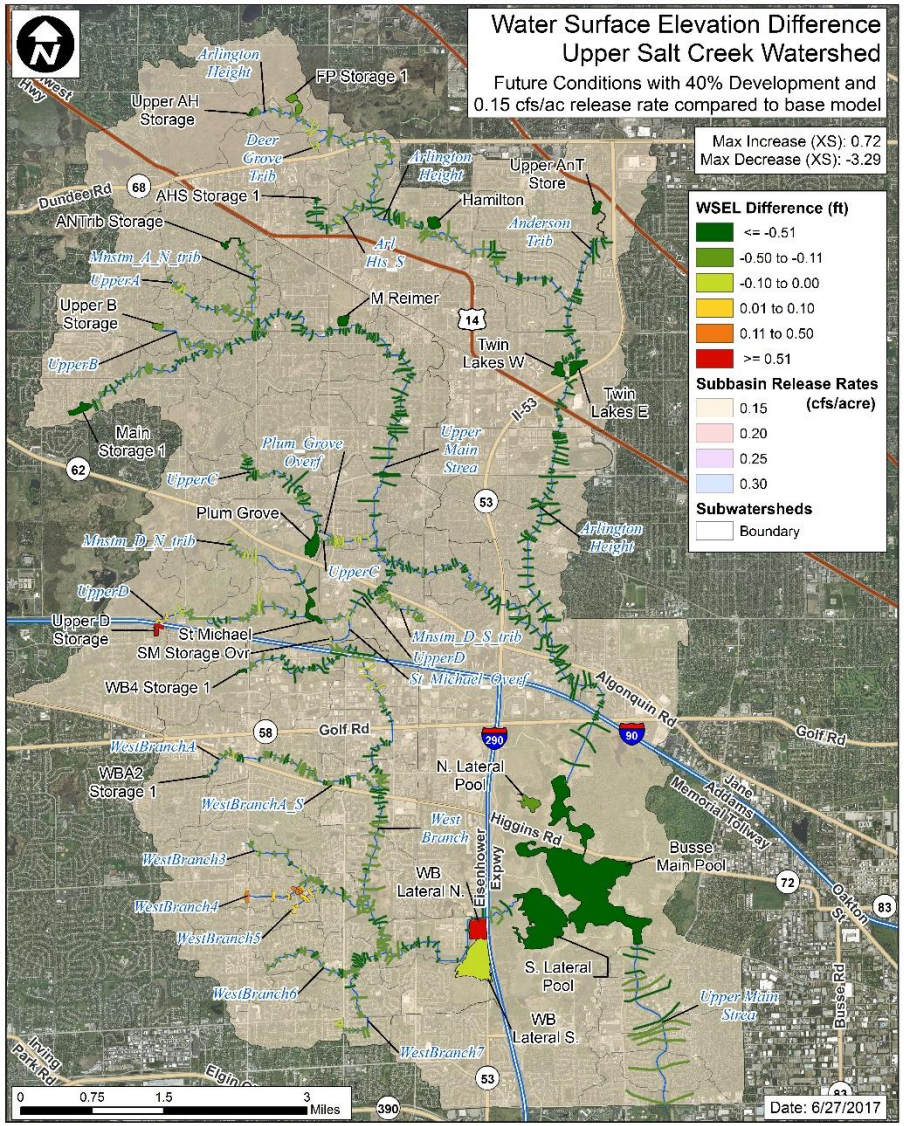
Modeled Subwatersheds:

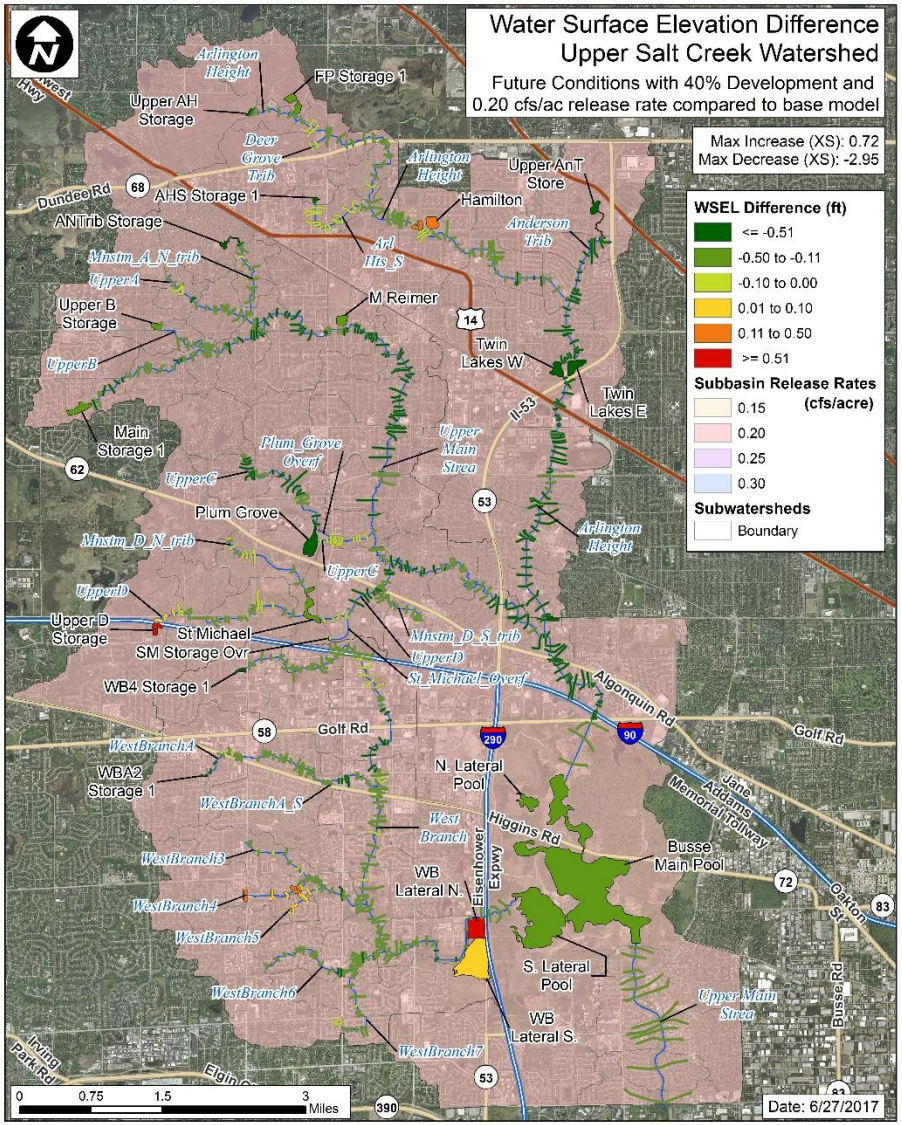
- Upper Salt Creek Mainstem
- Upper Salt Creek West Branch
- Upper Salt Creek Arlington Heights Branch

Base Runoff Rates

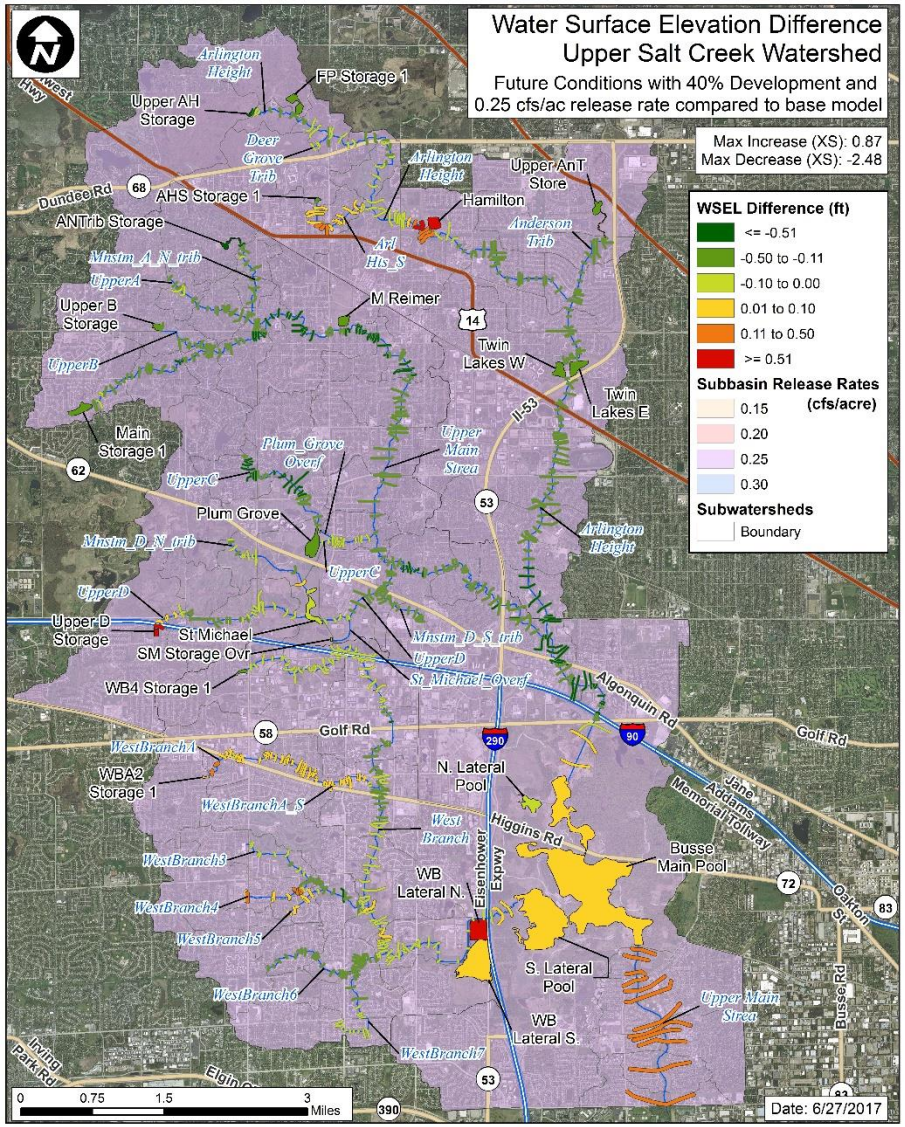
		24 hour		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
Upper Salt Creek	Upper Salt Creek Mainstem	0.36	0.11 - 0.68	24 hr
	Arlighton Heights Branch	0.35	0.14 - 0.63	24 hr
	West Branch	0.26	0.11 - 0.55	24 hr

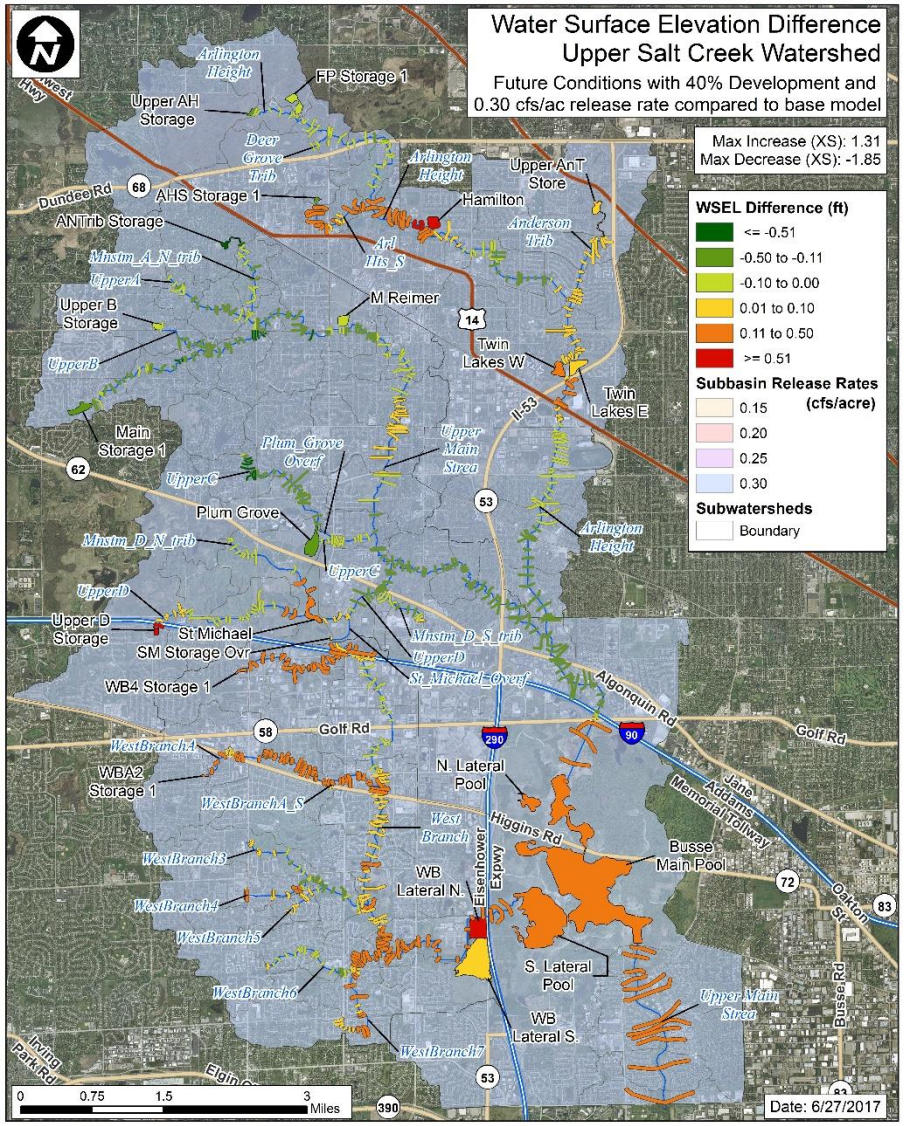
Future Model Results





Future Model Results





Analysis of Effect of Release Rates

Upper Salt Creek	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	2,200	2,530	15,794	83,964	282,780
	Stream length with increase in peak WSEl> 0.1’ (%)	0.8%	0.9%	5.6%	29.7%	
	Reservoirs in RAS model with increases > 0.5'	2	2	3	3	

Watershed Specific Release Rate Analysis: *Des Plaines River Watershed*

Base Model Summary

Modeled Subwatersheds:

- 67th Street Ditch
- Addison Creek
- Buffalo Creek
- Crystal Creek
- Des Plaines Tributary A
- East Ditch
- Flagg Creek
- Feehanville Ditch
- Farmer/Prairie Creeks
- Golf Course Tributary
- McDonald Creek
- Silver Creek
- Salt Creek
- Weller Creek
- Willow Creek

Special Considerations

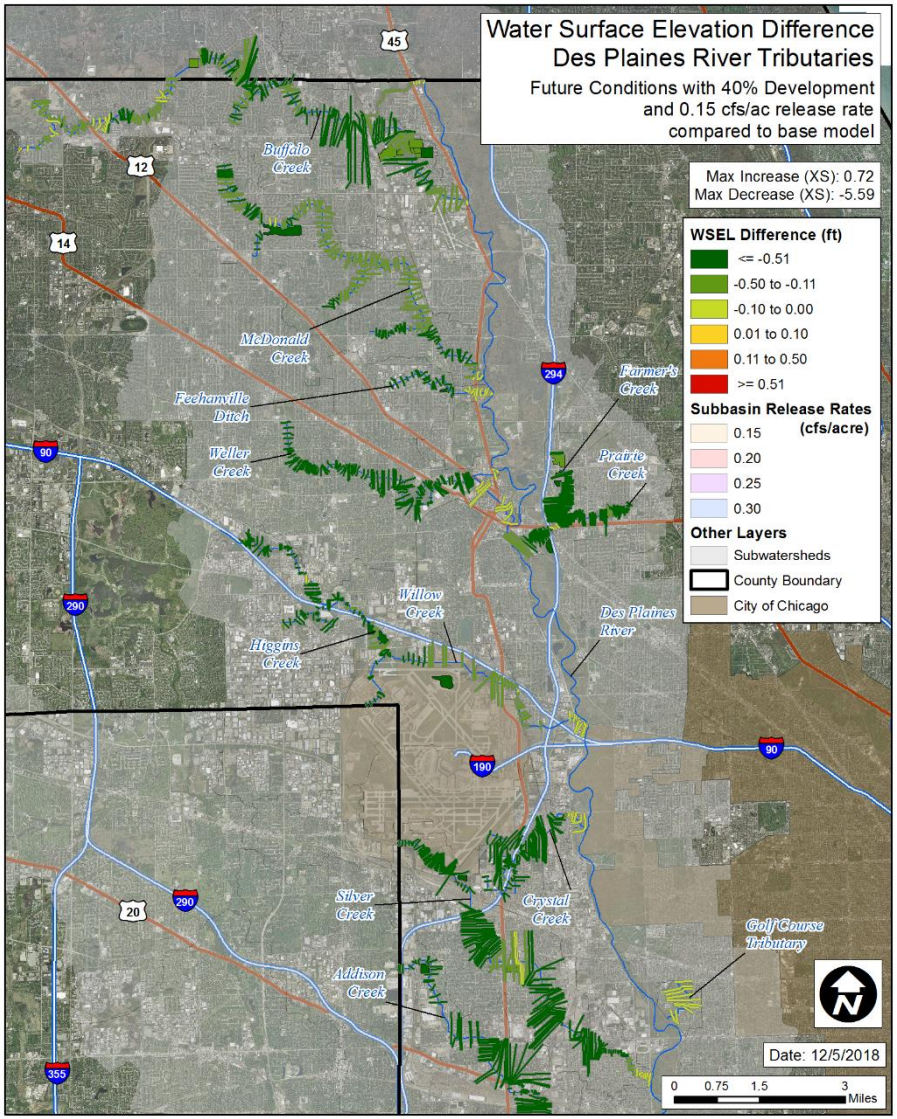
❖ Des Plaines River Mainstem

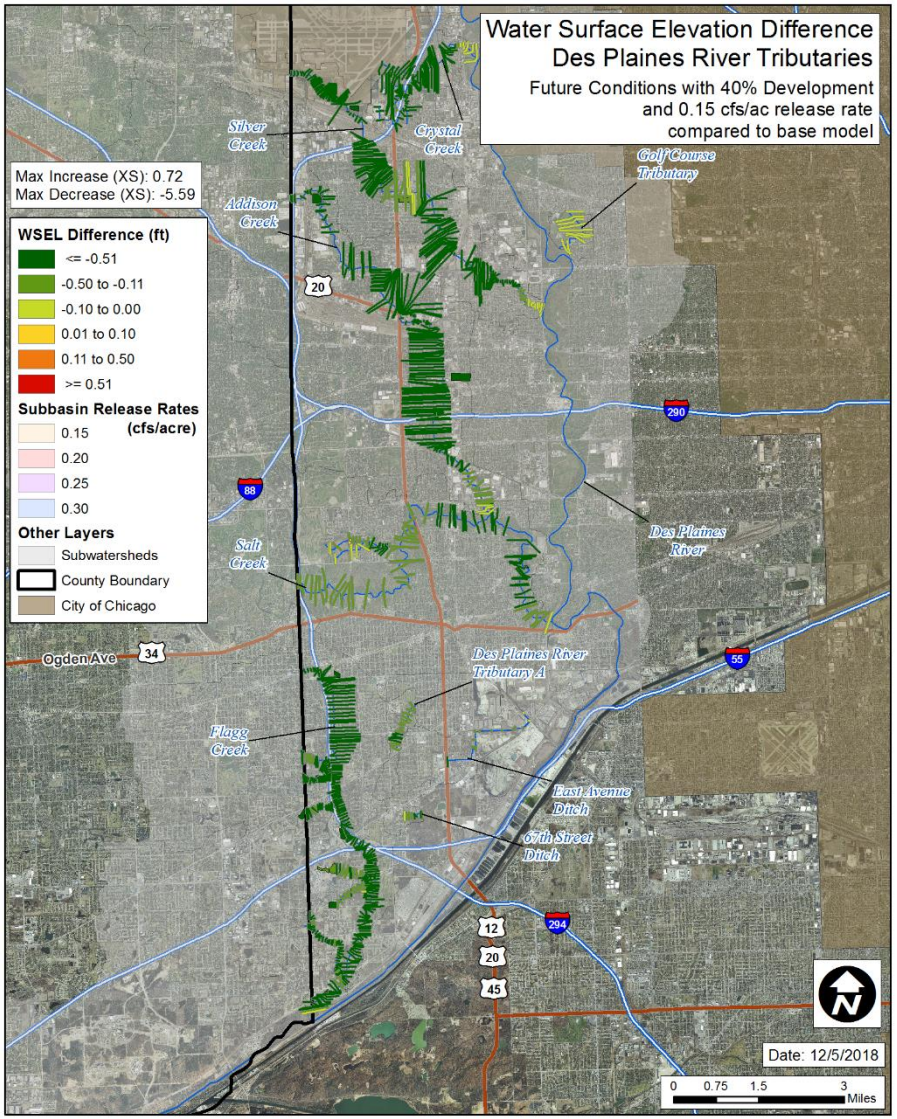
Base Model Summary

Base Runoff Rates

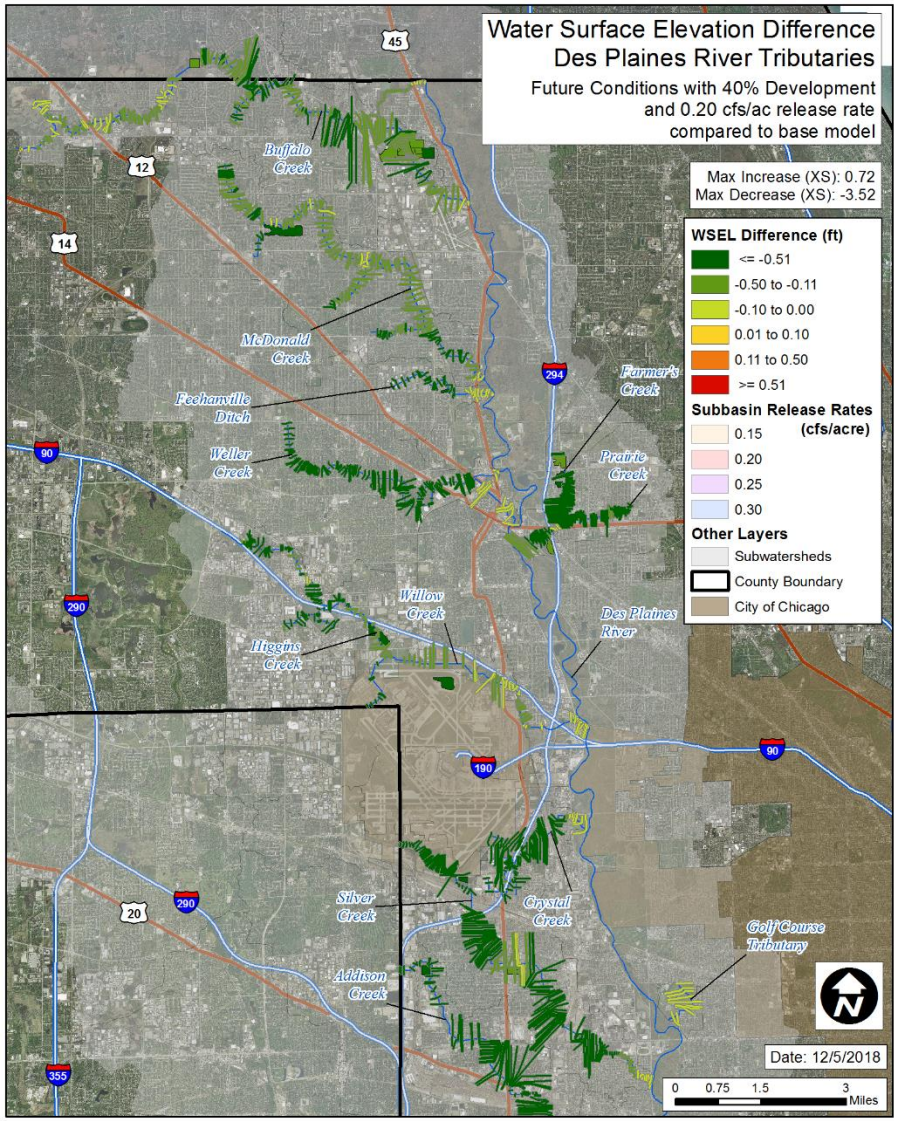
		24 hour		Critical duration		
	Subwatershed	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Average Base Conditions Peak Runoff Rate (cfs/acre)**	**Subbasin Base Conditions Peak Runoff Rate Range (cfs/acre)**	**Critical duration event**
Des Plaines River	67th Ditch	0.61	0.58 - 0.66	0.71	0.65 - 0.83	2 hr
	Addison Creek	0.45	0.25 - 0.84	--	--	24 hr
	Buffalo Creek	0.27	0.19 - 0.52	--	--	24 hr
	Crystal Creek	0.45	0.39 - 0.75	0.47	0.39 - 0.89	12 hr
	Tributary A	0.49	0.47 - 0.53	0.51	0.49 - 0.55	18 hr
	East Ditch	0.51	0.41 - 0.78	0.52	0.35 - 1.21	2 hr
	Feehanville Ditch	0.27	0.23 - 0.54	--	--	24hr
	Flag Creek	0.40	0.23 - 0.85	--	--	24 hr
	Farmers Prairie	0.59	0.25 - 1.08	0.69	0.23 - 1.15	12 hr
	Golf Course Tributary	0.38	0.38	--	--	24 hr
	McDonald Creek	0.30	0.2 - 0.66	--	--	24 hr
	Silver Creek	0.40	0.2 - 0.76	0.35	0.20 - 0.57	48 hr
	Salt Creek	0.25	0.11 - 0.51	0.2	0.11 - 0.32	72hr
	Weller Creek	0.35	0.22 - 0.70	0.32	0.21 - 0.55	48hr
	Willow Creek	0.32	0.21 - 0.55	--	--	24 hr
	DesPlaines River	0.21	0.07 - 0.57	0.07	0.04 - 0.12	10 day

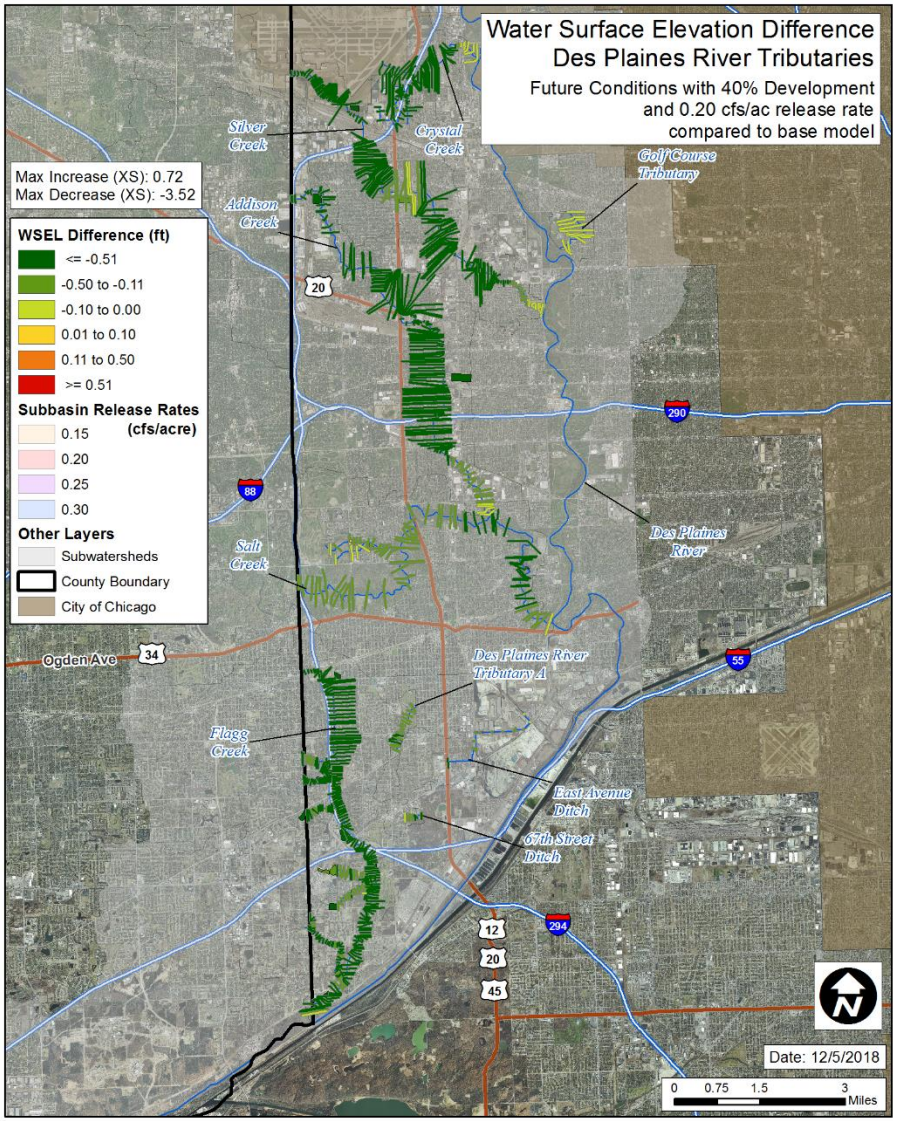
Future Model Results





Future Model Results





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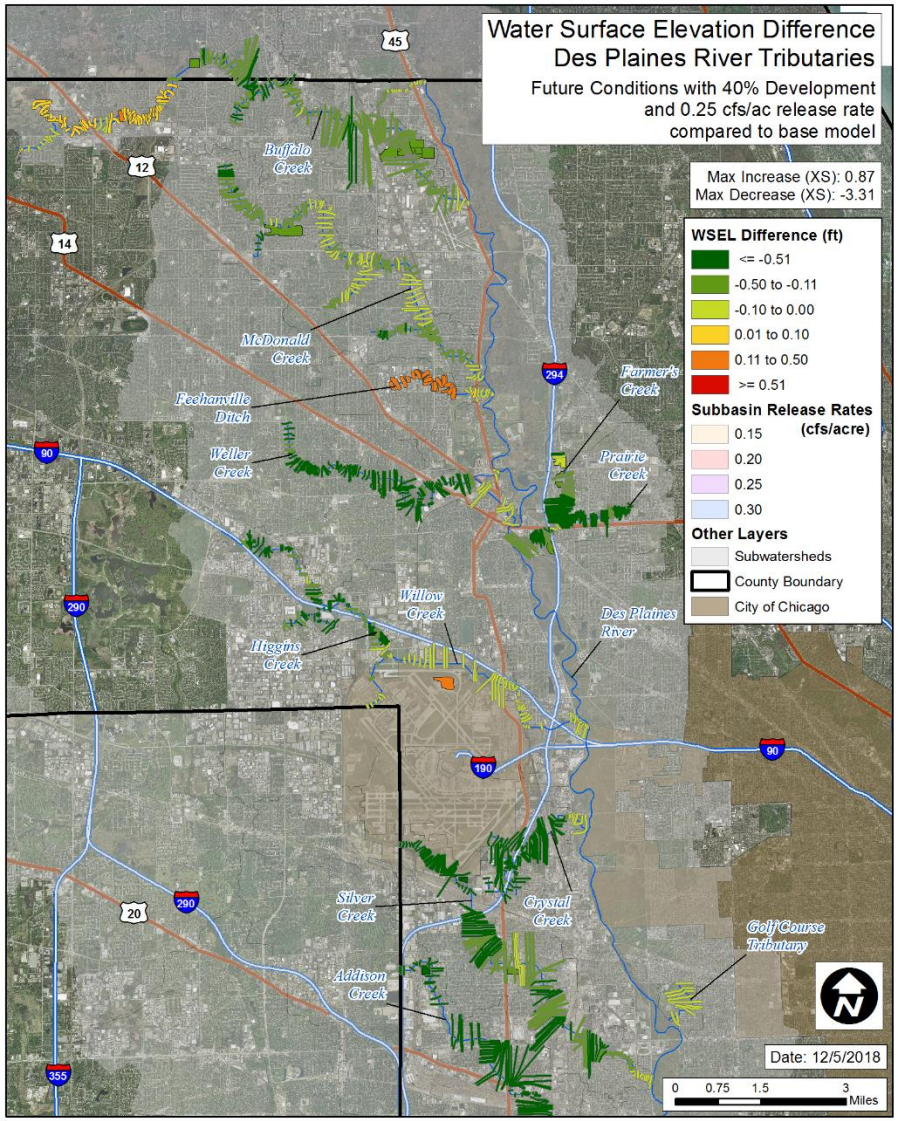
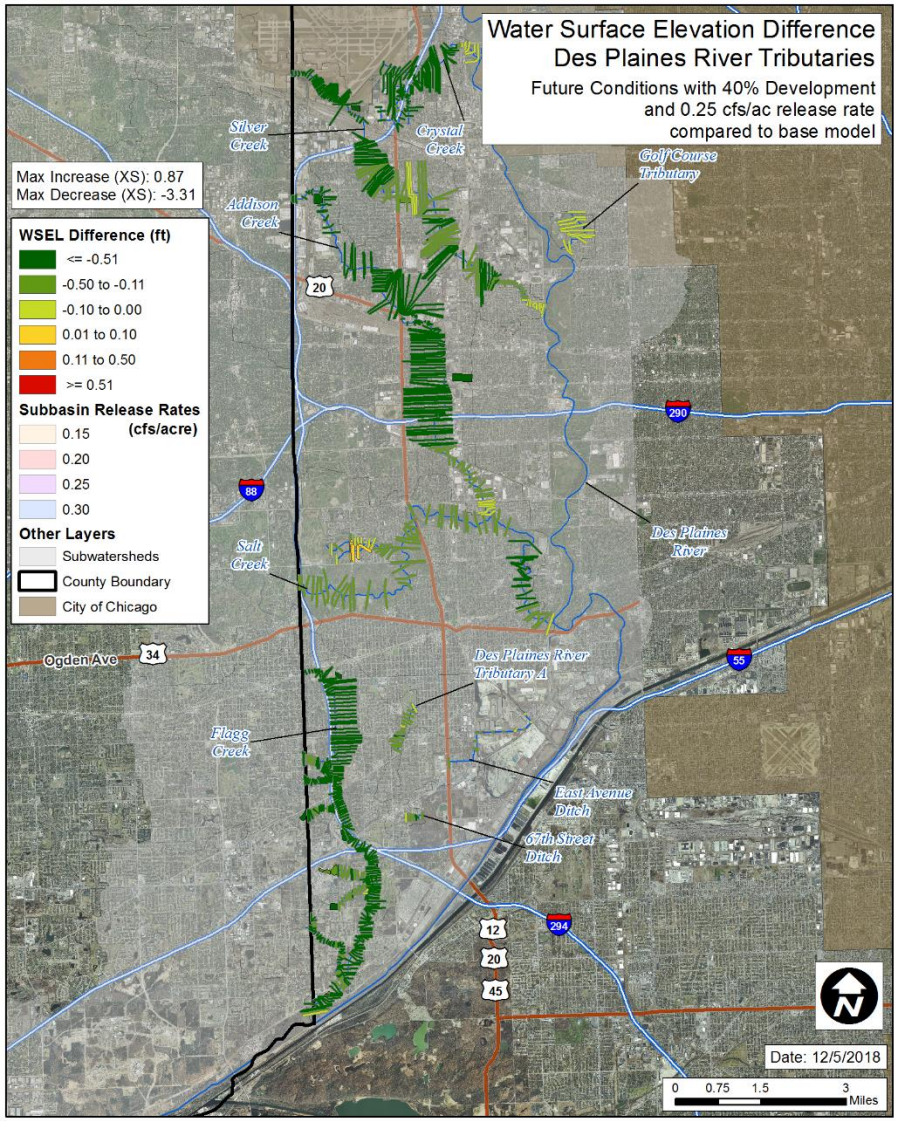
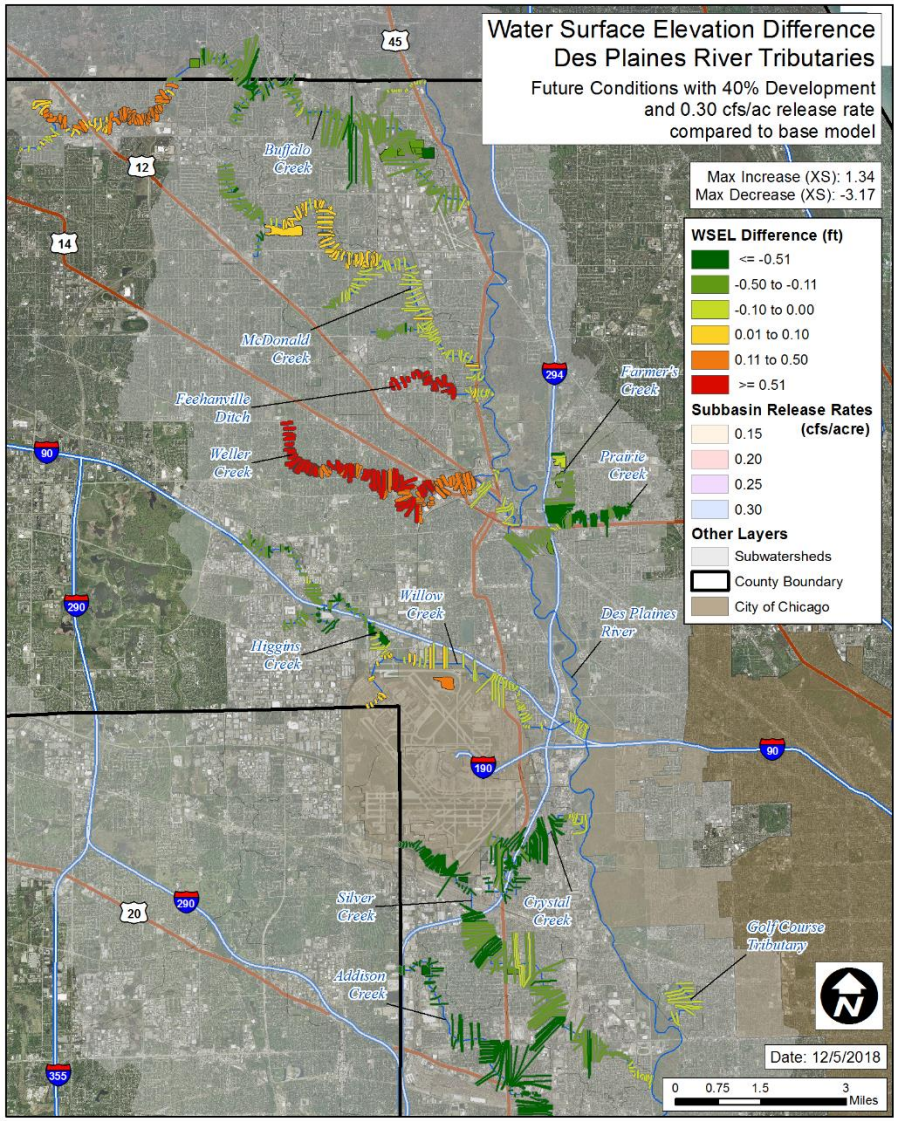
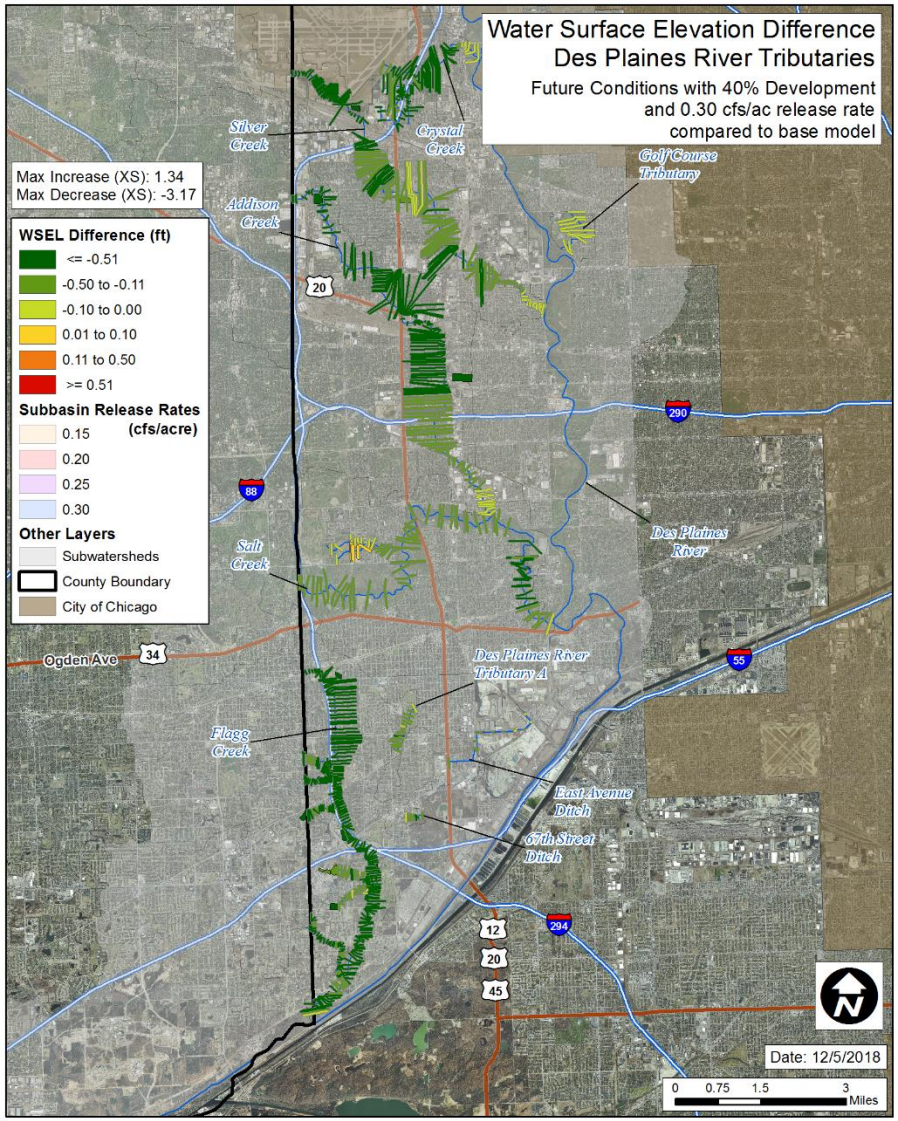




Future Model Results





Analysis of Effect of Release Rates

Criteria applied to Des Plaines and tributaries, Stream length with increases in peak WSEl > 0.1'	WMO release rate				Total length
	0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
~~Des Plaines River~~	~~180,949~~	~~205,860~~	~~194,438~~	~~193,860~~	~~257,312~~
Addison Creek	0	0	0	0	47,018
Buffalo Creek	0	0	66	10,582	70,930
Crystal Creek	0	0	0	0	27,930
DP Tributary A	0	0	0	0	5,077
East Ditch	0	0	0	0	14,078
Feehanville	0	0	9,661	9,661	12,030
Flag	0	0	0	0	72,177
Farmers Prairie	0	0	0	0	18,753
Golf Course Trib	0	0	0	0	5,787
McDonalds Creek	0	0	0	0	54,707
Silver Creek	0	0	0	0	39,640
Salt Creek	0	0	0	0	61,215
Weller Creek	0	0	0	32,240	37,999
Willow Creek	0	0	0	0	61,110
67th Ave	0	0	0	0	1,866

Analysis of Effect of Release Rates

Des Plaines River Watershed Tributaries	Criteria	WMO release rate				Total
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	Stream length
	Tributary stream length with increase in peak WSEl> 0.1’ (ft)	0	0	9,727	52,483	530,318
	Tributary stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	1.8%	9.9%	
	Reservoirs with increases > 0.5'	0	0	0	2	

Results:
Considerations for Watershed Specific Release Rates

Analysis of Effect of Release Rates

Cal-Sag Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	0	166,027
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

North Branch Chicago River Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	108	108	0	286,663
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	0.0%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

Analysis of Effect of Release Rates

Poplar Creek Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	0	0	0	2,448	203,498
	Stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	0.0%	1.2%	
	Reservoirs in RAS model with increases > 0.5'	0	0	0	0	

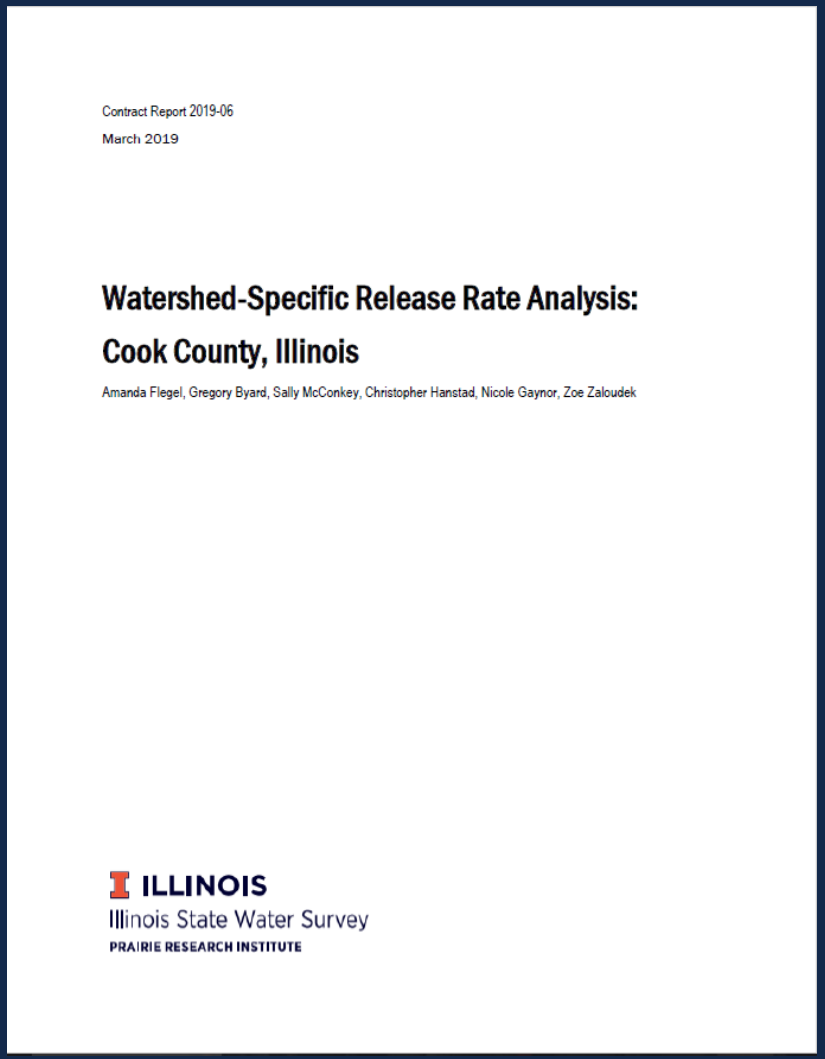
Little Calumet River Watershed	Criteria	WMO release rate				Total Stream length
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	
	Stream length with increase in peak WSEl> 0.1’ (ft)	1,066	1,066	1,066	10,796	256,719
	Stream length with increase in peak WSEl> 0.1’ (%)	0.4%	0.4%	0.4%	4.2%	
	Reservoirs in RAS model with increases > 0.5'	0	1	0	1	

Analysis of Effect of Release Rates

Upper Salt Creek Watershed	Criteria	WMO release rate				Total
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	Stream length
	Stream length with increase in peak WSEl> 0.1’ (ft)	2,200	2,530	15,794	83,964	282,780
	Stream length with increase in peak WSEl> 0.1’ (%)	0.8%	0.9%	5.6%	29.7%	
	Reservoirs in RAS model with increases > 0.5'	2	2	3	3	

Des Plaines River Watershed	Criteria	WMO release rate				Total
		0.15 cfs/ac	0.20 cfs/ac	0.25 cfs/ac	0.30 cfs/ac	Stream length
	Tributary stream length with increase in peak WSEl> 0.1’ (ft)	0	0	9,727	52,483	530,318
	Tributary stream length with increase in peak WSEl> 0.1’ (%)	0.0%	0.0%	1.8%	9.9%	
	Reservoirs with increases > 0.5'	0	0	0	2	

Phase I and II Study Results


Contract Report 2019-06

March 2019

Watershed-Specific Release Rate Analysis:

Cook County, Illinois

Amanda Flegel, Gregory Byard, Sally McConkey, Christopher Hanstad, Nicole Gaynor, Zoe Zaloudek

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Illinois State Water Survey
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http://hdl.handle.net/2142/103416

Illinois State Water Survey-

- Delivered presentations to the MWRD Technical Advisory Committee, each of the Watershed Planning Councils, and two public meetings
- Released ISWS Contract Report 2019-06 in March 2019

MWRD Board of Commissioners-

- Took the study results under consideration and adopted Watershed Specific Release Rates consistent with the study results as part of the May 16, 2019 update to the WMO
- The adopted release rates became effective January 1, 2020
- The May 16, 2019 update also included provisions for additional future studies related to watershed specific release rates under WMO Article 208

Phase III Study - ongoing

208. Study of Current Provisions of and Potential Amendments to this Ordinance

The District shall initiate a study of certain current provisions of and potential amendments to this Ordinance. This study will be initiated by the end of 2019 with a targeted completion date of May 2022. The study shall include the following areas:

1. **A pilot study of a regional stormwater detention and volume control credit trading program;**
2. **Impacts of watershed specific release rates on disproportionately impacted communities;**
3. **Impacts of release rates under existing and future development scenarios in collar counties on watersheds in the District;**
4. **Impact of volume control and watershed specific release rates on stream erosion and related water quality effects such as turbidity and sedimentation; and**
5. **Board of Commissioners shall consider the study in May 2022.**

Contact Information

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Illinois State Water Survey

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