

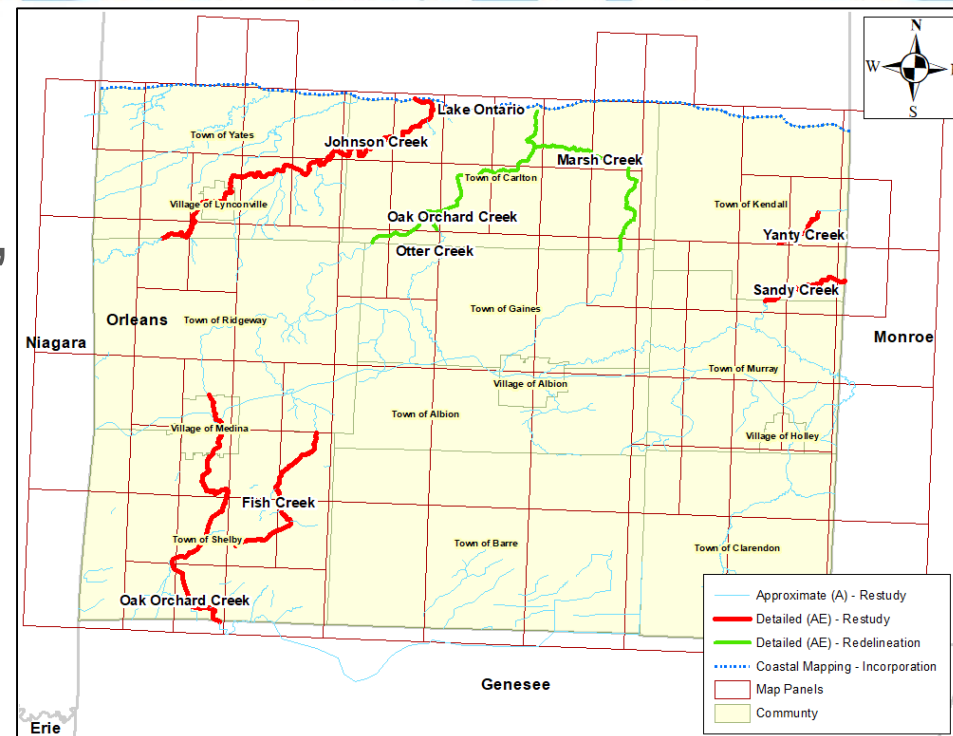
Flood Risk Project

Orleans County, New York,
Hydraulics Meeting

October 29, 2020



FEMA



Presentation Agenda



Recap/Refresh



Hydraulics
Analysis Review



Path Forward



FEMA



What Have We Done So Far?

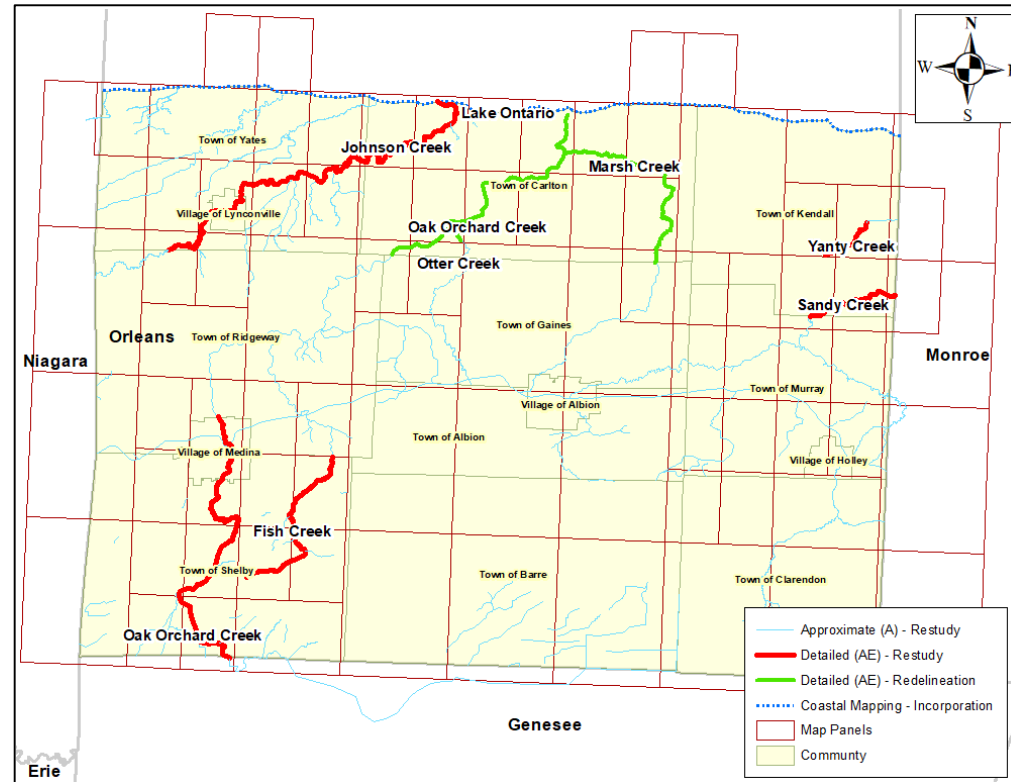
Recap/Refresh



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This Project Scope

- ▶ First time digital countywide maps
- ▶ Additional flooding sources analyzed
 - Detailed (AE) studies – 5 streams, 36 miles
 - Approximate (A) studies – multiple streams, 241 miles
 - Redelineation (AE) – 3 streams, 17 miles
- ▶ Incorporates coastal mapping
- ▶ 14 affected communities
- ▶ 86 map panels
- ▶ Multiple touchpoints



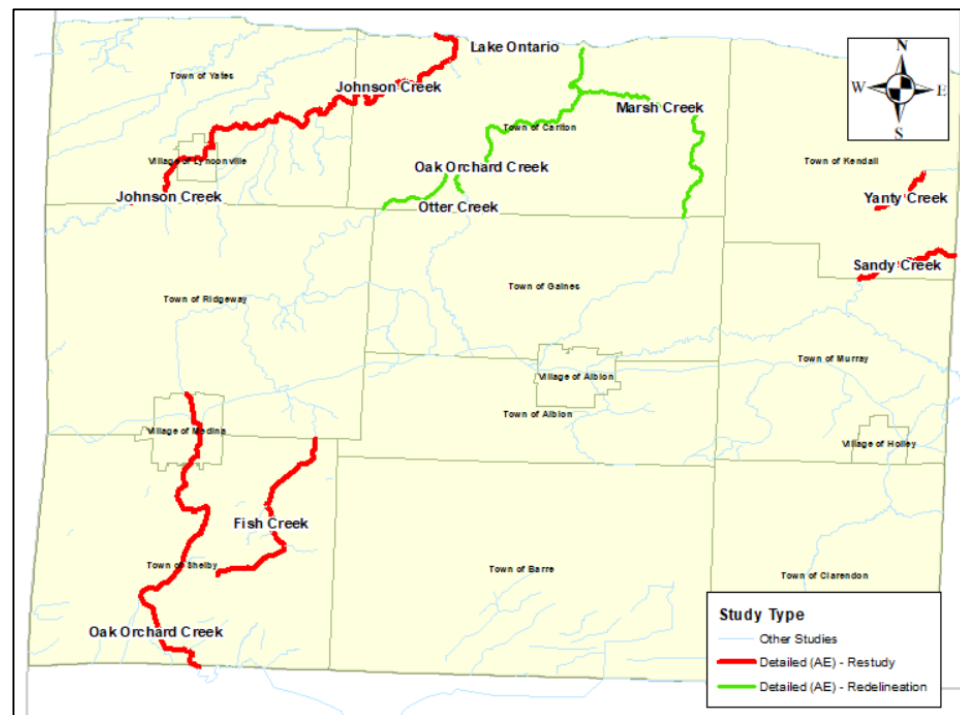
Scope

► 5 Detailed (AE) Streams – 36 miles total

- Oak Orchard Creek – 10.5 miles
- Fish Creek – 5.8 miles
- Johnson Creek – 14.7 miles
- Sandy Creek – 3 miles
- Yanty Creek – 1.8 miles

► Multiple Approximate (A) Streams – 200+ miles total. Notable Streams:

- Oak Orchard Creek – 16 miles
- Johnson Creek – 4 miles
- Marsh Creek – 7 miles
- Otter Creek – 6.7 miles
- Sandy Creek – 2 miles
- Yanty Creek – 1 miles
- East Branch Sandy Creek – 17.2 miles
- West Branch Sandy Creek – 14.6 miles



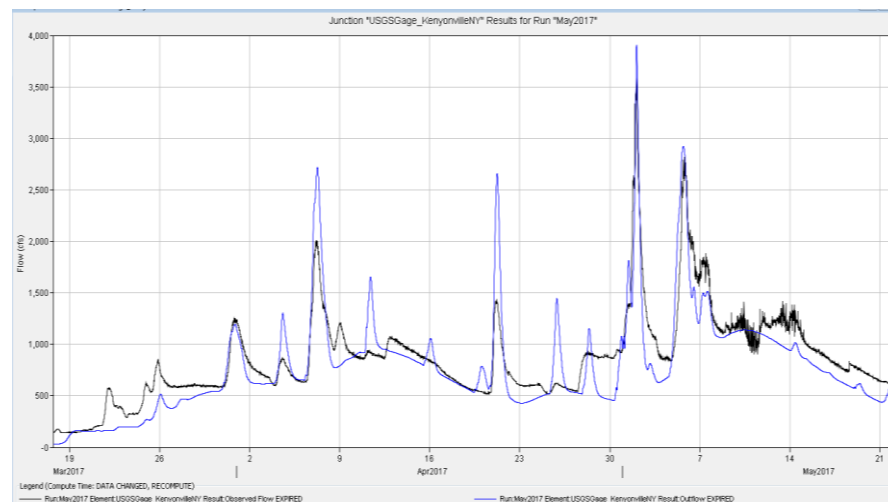
26 miles of Erie Canal - Approximate study



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Hydrology Update

- ▶ **Rainfall-Runoff Modeling for all flooding sources**
- ▶ **Since Sep, 2019 hydrology webinar,**
 - Additional calibration and validation performed.
 - Upper Oak Orchard analyses upgraded to account for flow attenuation due to large wetlands and storage areas.
 - Two dimensional (2D) hydraulic modeling employed
- ▶ **Discharges developed for**
 - 10%, 4%, 2%, 1%, 1%+, 1%-, 0.2%
- ▶ **Erie Canal – Regulated flow obtained from NY Power Authority**



Calibration plot at Kenyonville, NY Gage

— Modeled Flow (cfs)
— Observed Flow (cfs)



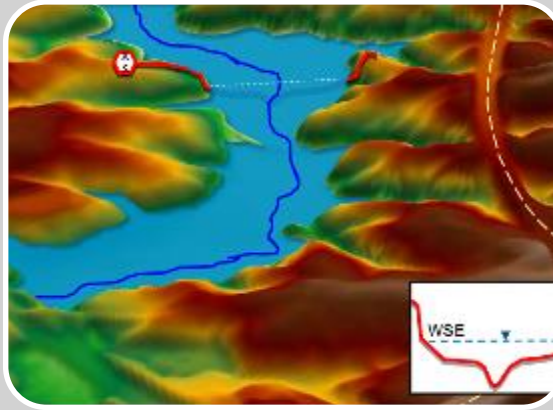
Where are we now?

Hydraulics Analysis Review



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Flood Hazard Analysis



Hydrology

Volume of water?
Peak Flows?

When will storm
water or runoff make
it to the stream?

Hydraulics

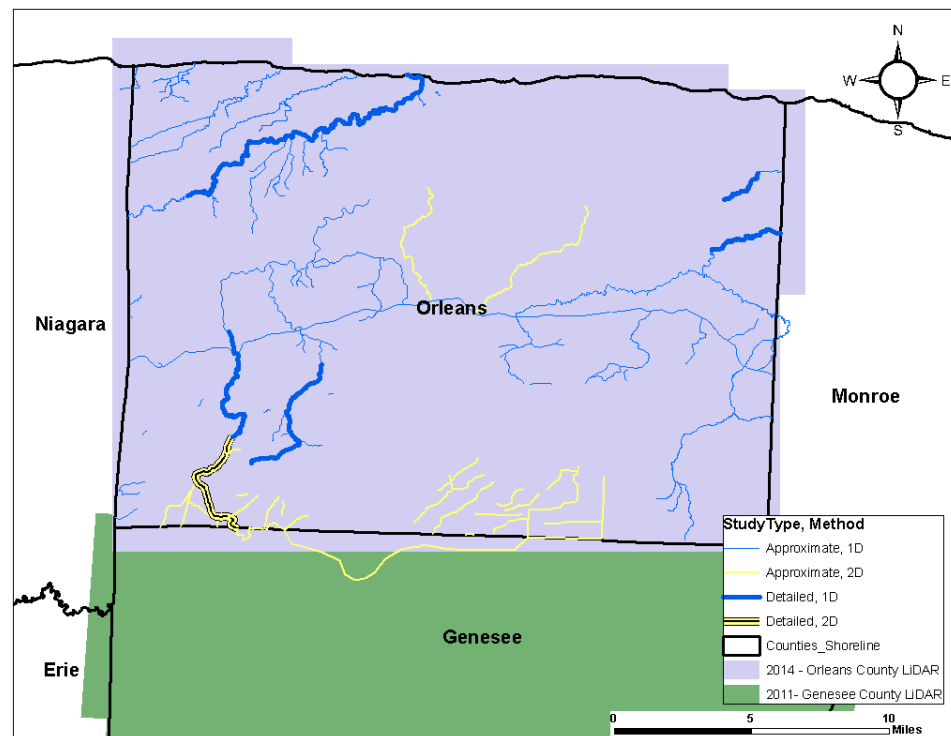
Will the stream in
question be able to
convey all storm
water or runoff that
arrives?

Floodplain Mapping

What areas of a
community will be
inundated based on
engineering analysis?

Data Sources - Terrain

- ▶ 2014 Orleans County FEMA LiDAR
- ▶ 2011 Genesee County LiDAR
- ▶ 2 meter Digital Elevation Model (DEM) Developed
- ▶ Provided overbank elevations for hydraulic model
- ▶ Channel geometry for AE streams provided field survey
- ▶ Used for mapping the flood hazard boundaries



Data Sources – Field Survey

- ▶ Conducted for AE Streams only
- ▶ Included Channel and bridge/culvert geometry data to supplement LiDAR
- ▶ 'A' streams not included
- ▶ A separate field Reconnaissance conducted to assess the site and floodplain conditions.



FEMA FY18 Region II - Sketch Form

Stream: KEUKA LAKE OUTLET Date: 4/11/19
Section: KEH-00-300 Crew: CJ, BM, RK
ERM Desc: CUT SQUARE IN UPSTREAM LEFT WINGWALL
Comments: BRIDGE

Data Sources – Roughness Coefficients

- ▶ Mannings “n” model parameter
- ▶ For approximate reaches, land use from National Land Cover Database (2016)
- ▶ For detailed reaches, further refinement using survey photos and aerial imagery

Description	Manning's “n”
Open Water	0.025
Developed, Low Density	0.07
Developed, Medium Density	0.08
Developed, High Density	0.09-0.12
Woods / Forest	0.07-0.12
Grassland / Herbaceous	0.04
Pasture / Hay / Cultivated Crop	0.04
Channel	0.025-0.055






KEU_00_000_DSCH.JPG KEU_00_000_DSFACE.JPG
KEU_00_000_USCH.JPG KEU_00_000_USFACE.JPG

DEWBERRY

Stream: Keska Lake Outlet				Project: Yates County - Village of Penn Yan			
Designed by:	Date: 7/25/2020	Checked by: Z/L	Date: 7/25/2020	Page	1 of 1		

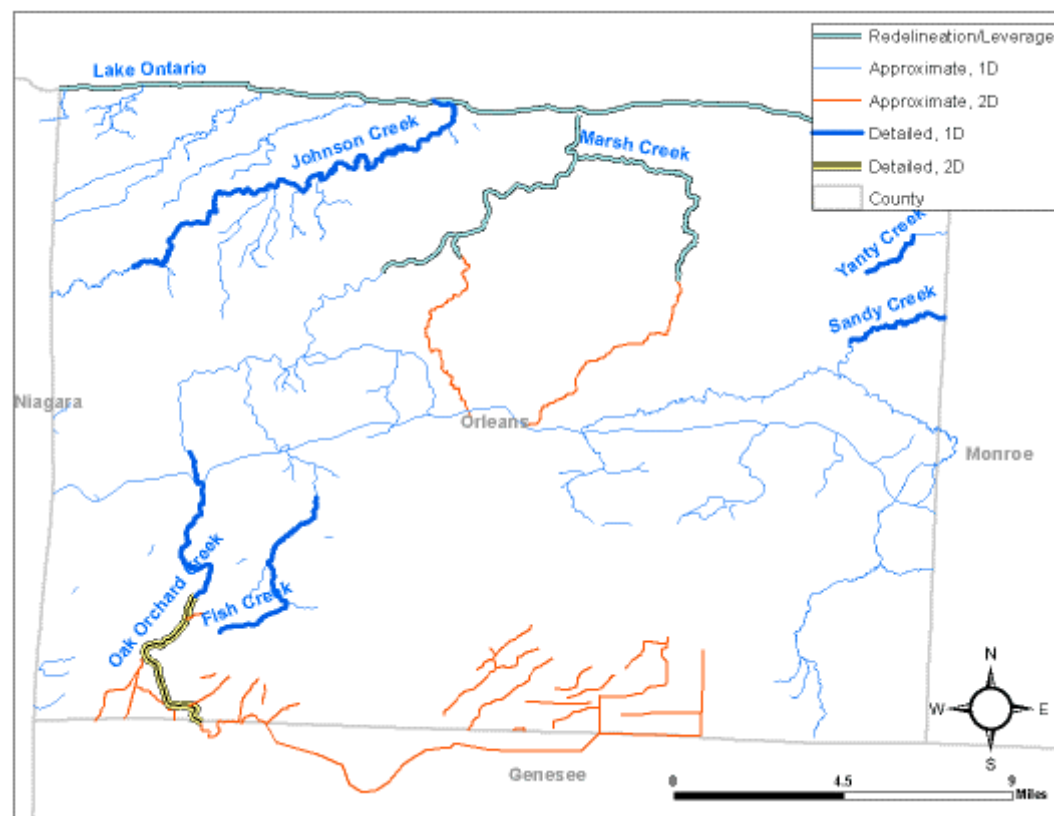
Columns	Reach	Description of Reach, Station, or Cross-section	n6				n7				n2				n3				n4				n5				Total "n" (n6+n7+n2+n3+n4+n5)
			Basin "n"				Surface Irregularity				Variations in Size and Shape of Cross-section				Obstructions				Vegetation				Meandering				
			Earth	Rock	Tree Gravel	Cobble	Smooth	Minor	Medium	Severe	Steady	Gradual	Irregular	Frequent	Highly	Minor	Medium	Severe	Low	Medium	High	Very High	Minor	Medium	Severe		
US & DS	Left Overbank																										
	Channel				0.025		0.025					0.005		0.000				0.005					1.000				
	Right Overbank																										



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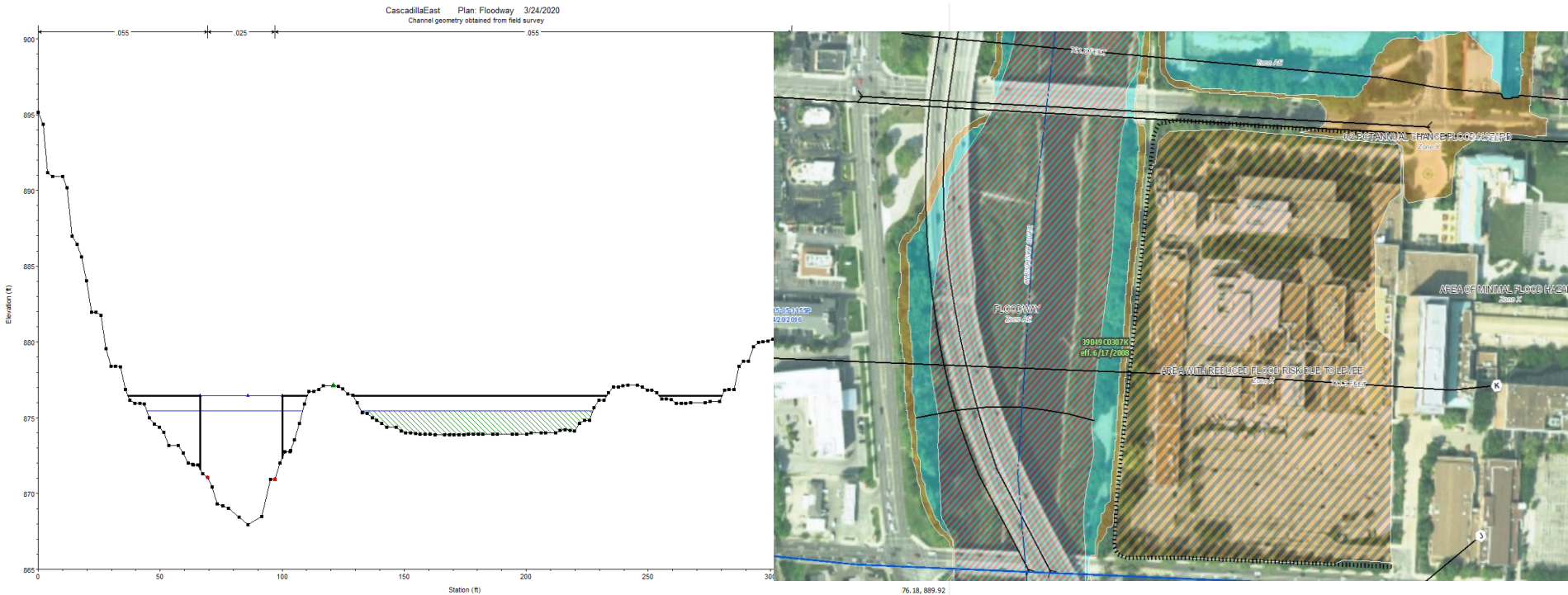
Hydraulics Methodology

- ▶ **USACE's HEC-RAS 5.0.7 used**
- ▶ **One-Dimensional (1D) Steady State Analyses**
 - 4 AE streams (Johnson, Fish, Yanty and Sandy)
 - Lower Oak Orchard
 - Most approximate streams
- ▶ **Two-Dimensional Analyses**
 - Upper Oak Orchard Creek – AE
 - Marsh Creek, Otter Creek – A
 - All 'A' streams in Upper Oak Orchard watershed
- ▶ **Survey data included for AE**
- ▶ **Multiple frequency runs included**
- ▶ **AE streams include floodway run**



Floodway Analysis

- ▶ **Detailed Streams only**
- ▶ **Encroachments placed to achieve target 1.0' rise**



Hydraulics Report

Hydraulics Report

Orleans County, New York
MIP Case Number 19-02-0011S Deliverable

Prepared by:



Contract No. HSFE60-15-D-0005

Task Order 70FBR2-18-F00000162

Date: October 31, 2020



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Results of the Study

► **New countywide floodplains data**

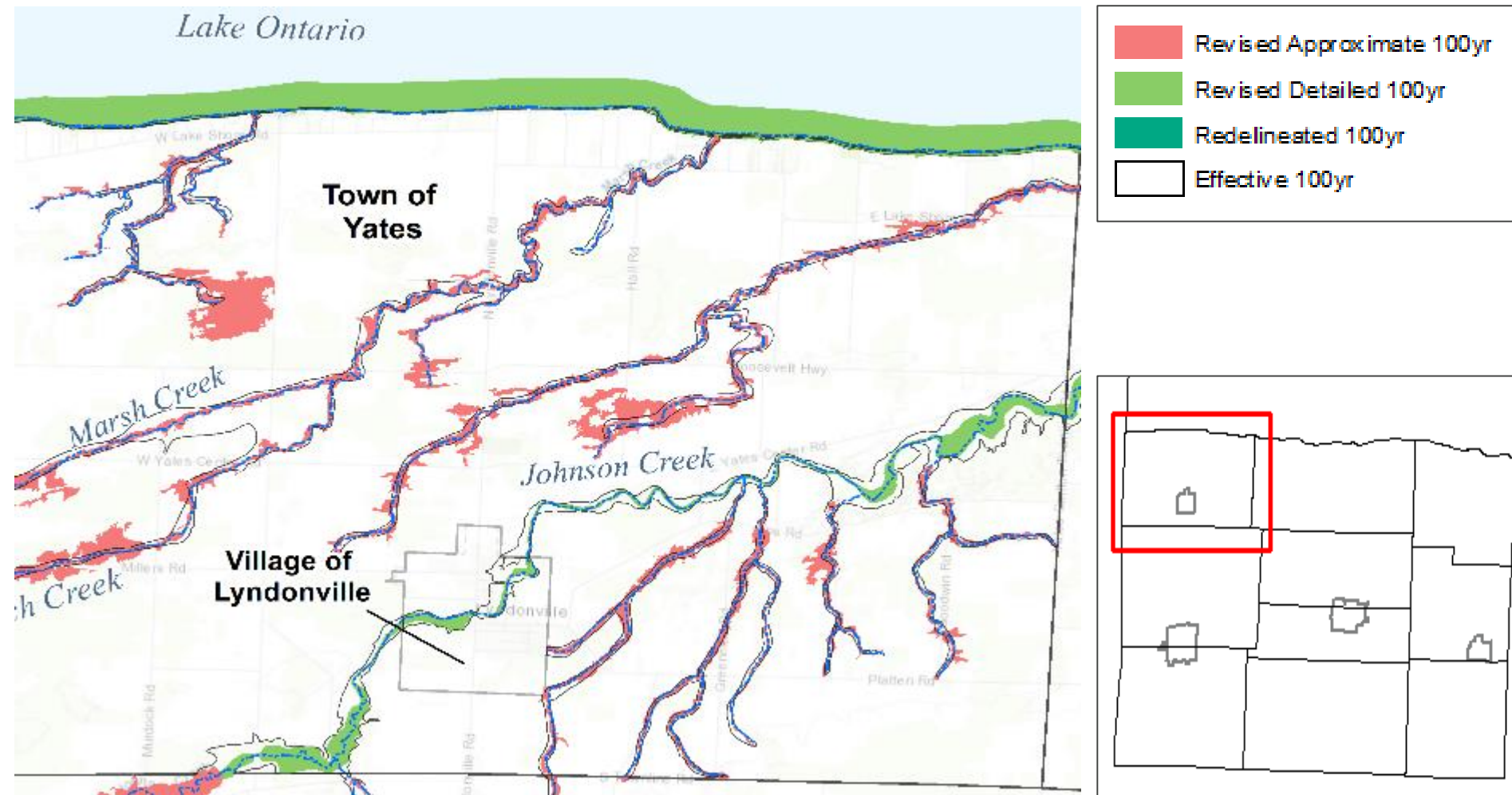
- Expanded floodplain coverage
- Added additional streams with Base Flood Elevations
- Continuous modeling and mapping outside of community boundaries
 - To support future community development
- Includes 500-year floodplain

Floodplain Mapping Comparisons

► **New countywide digital data**

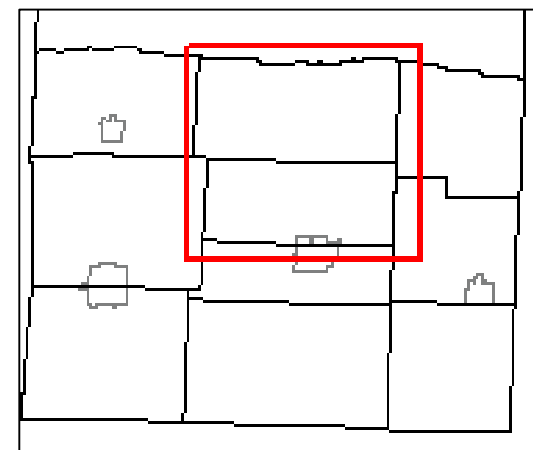
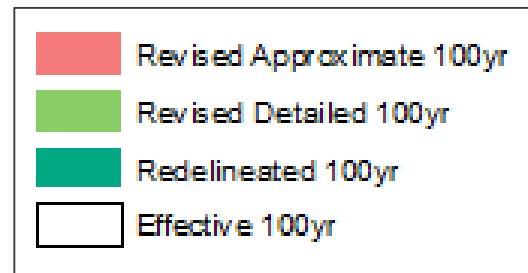
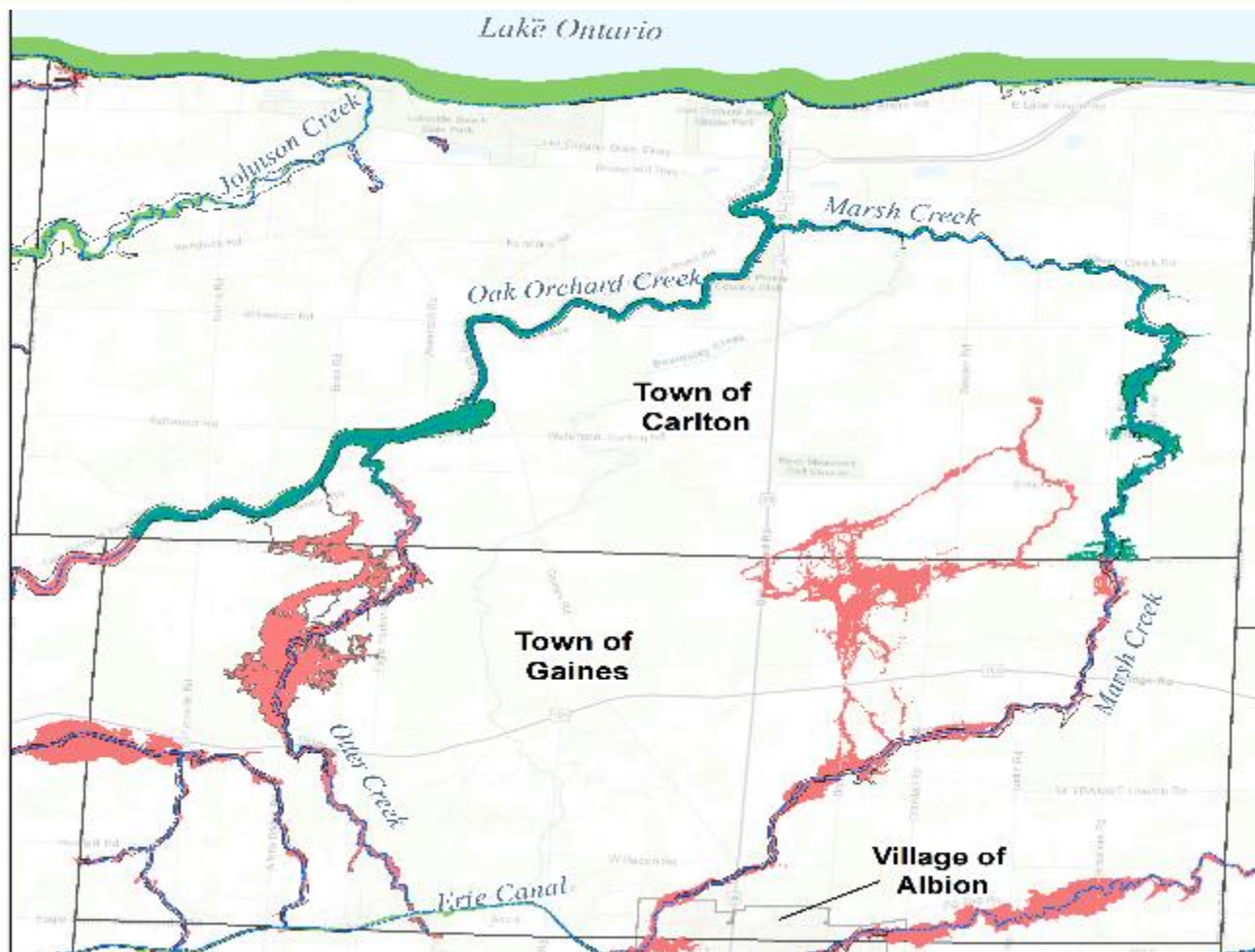
- Previous maps produced in 1970s-1980s
- Reason for changes in Floodplains and Base Flood Elevations (BFEs)
 - New Topography
 - Channel and Structure Survey
 - Changes to Land Use
 - Changes to Rainfall
 - Detailed Hydrologic and Hydraulic Analysis

Town of Yates & Village of Lyndonville



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Town of Gaines & Carlton, Village of Albion

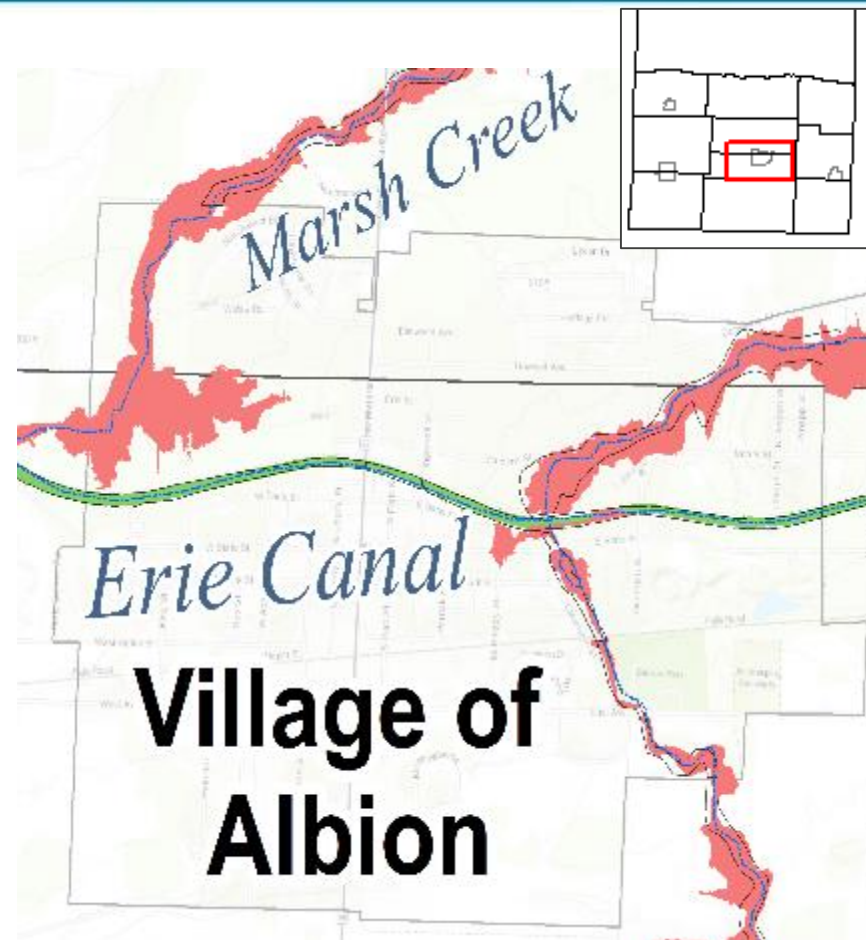
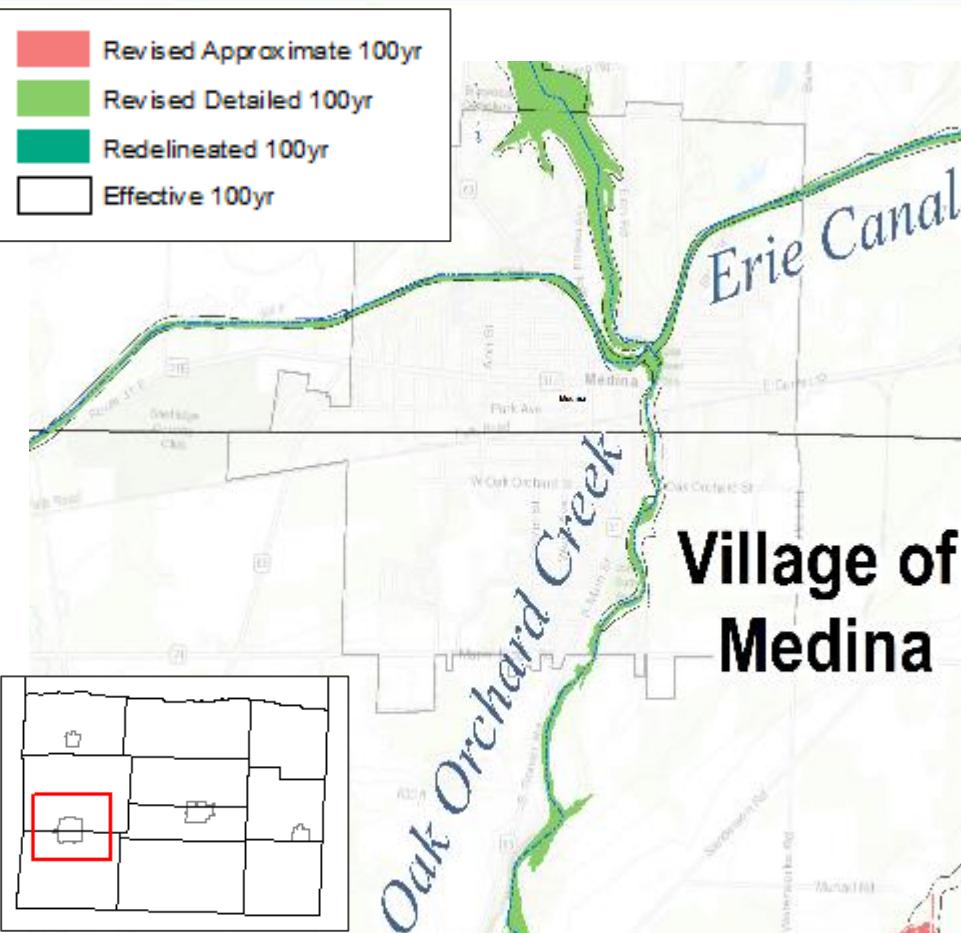


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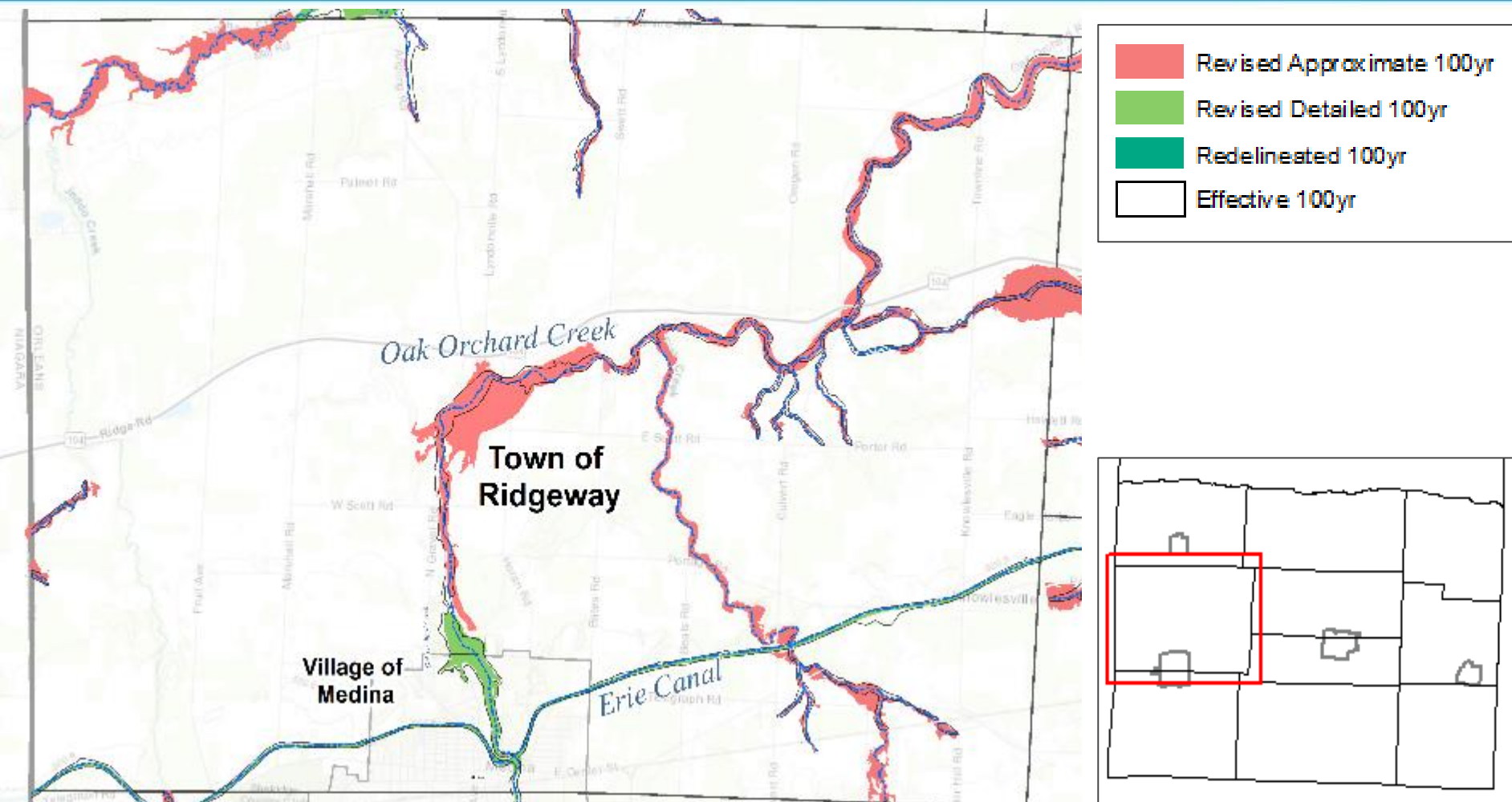
RiskMAP
Increasing Resilience Together

Village of Medina, Village of Albion



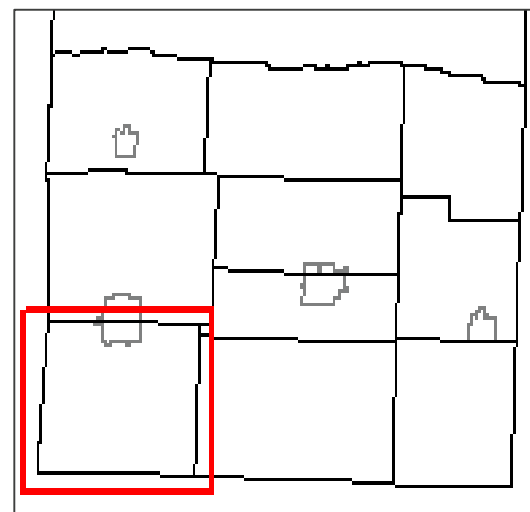
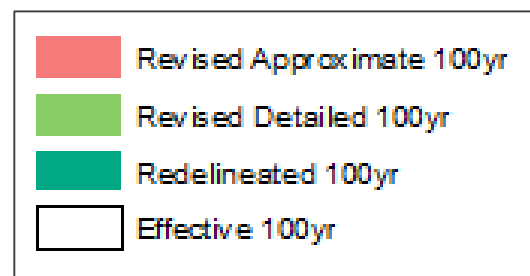
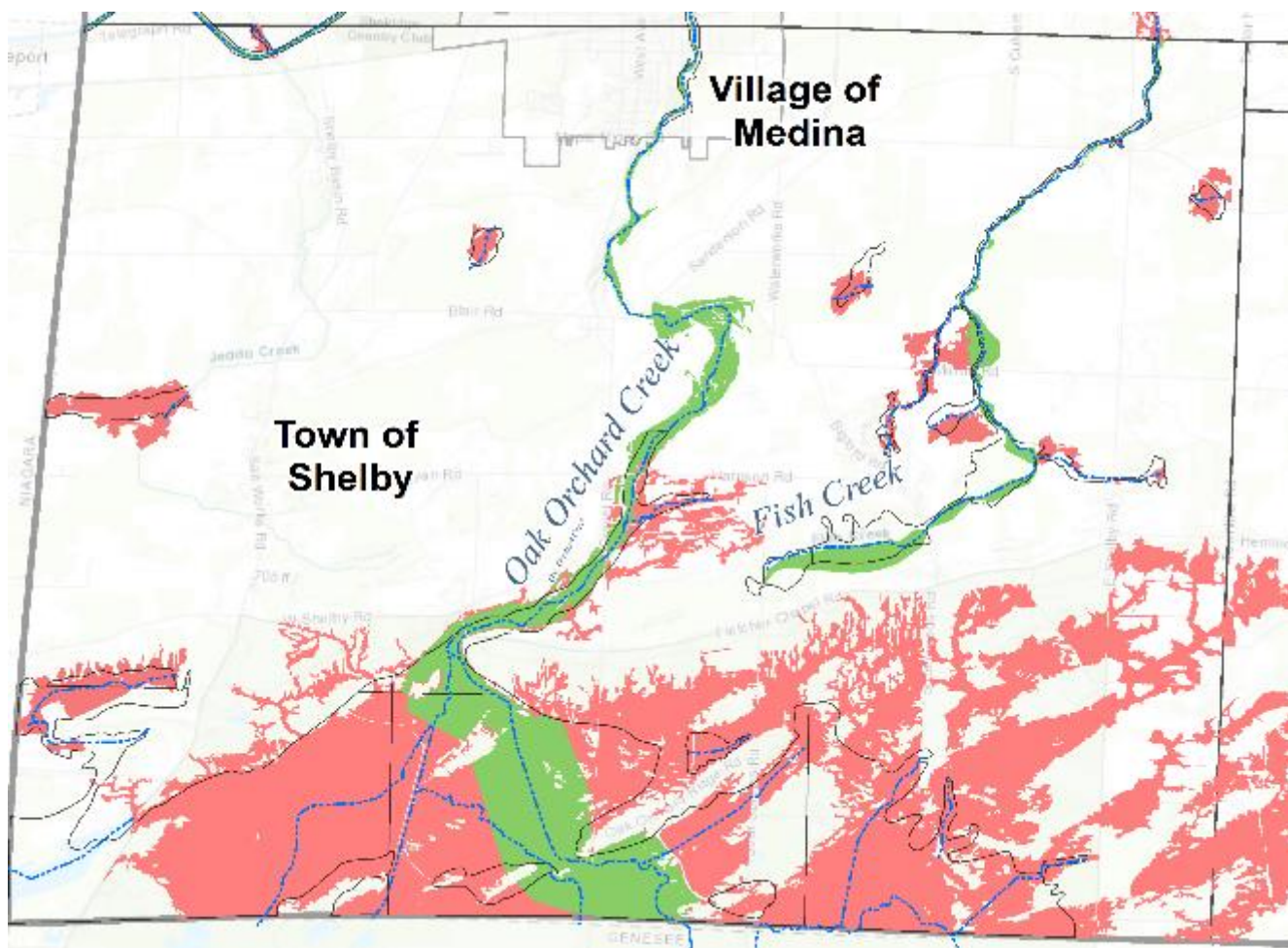
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Town Ridgeway, Village of Medina



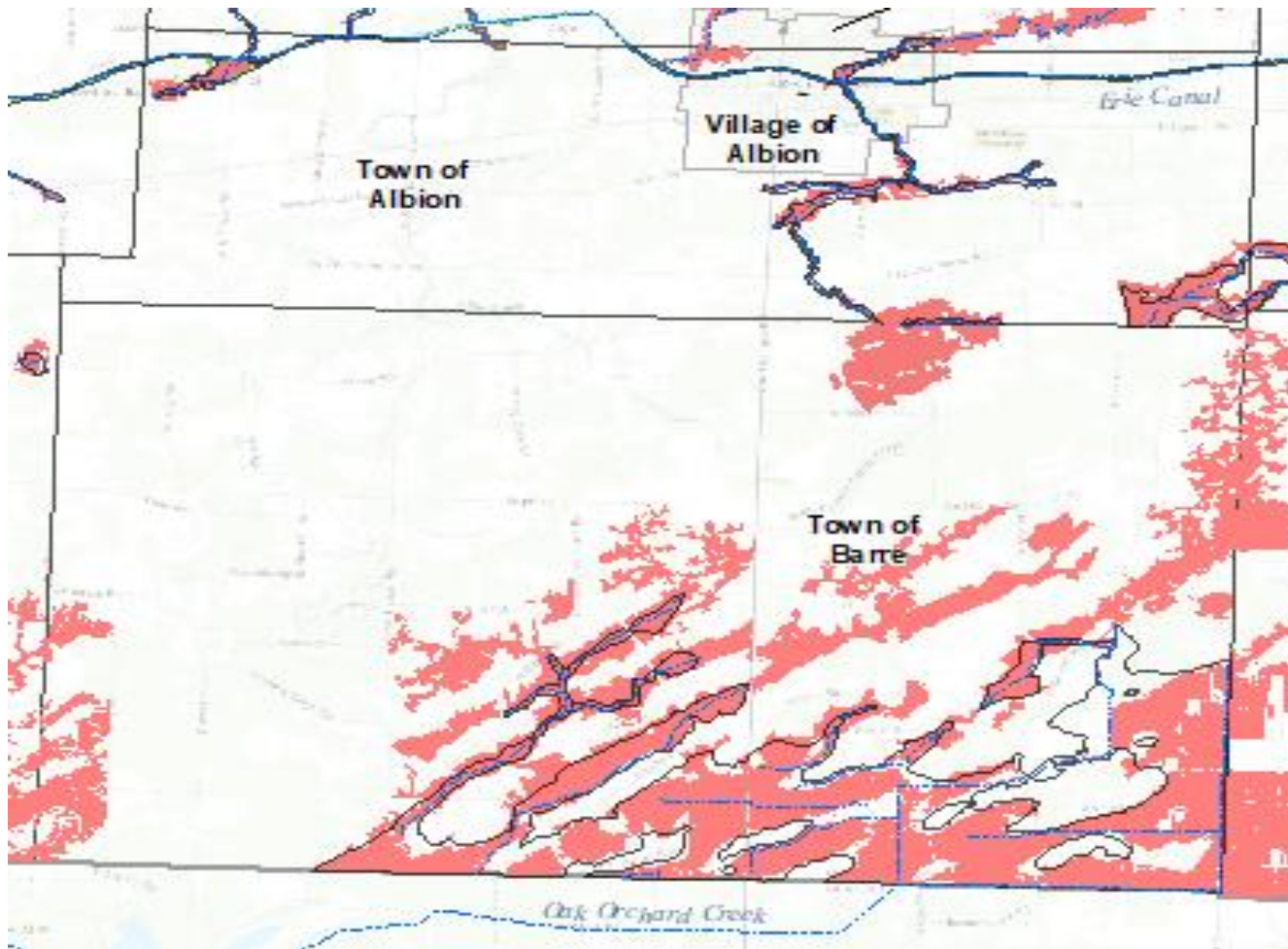
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Town Shelby, Village of Medina

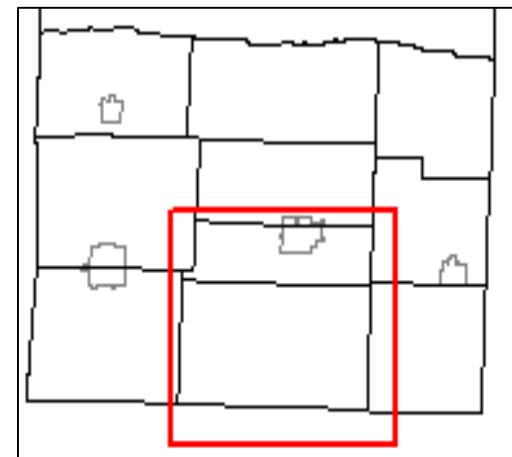


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Towns of Albion & Barre, Village of Albion

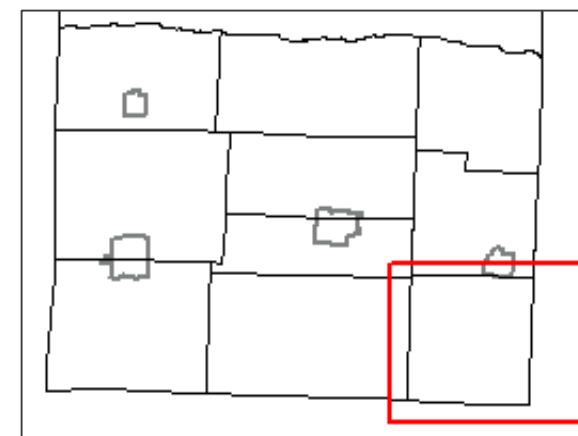
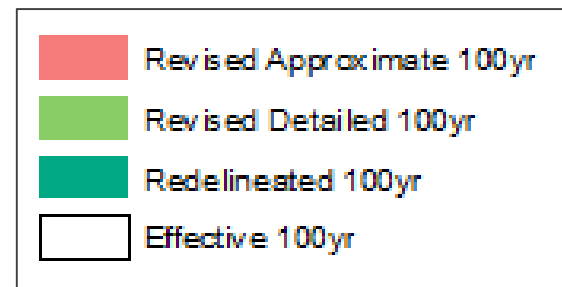
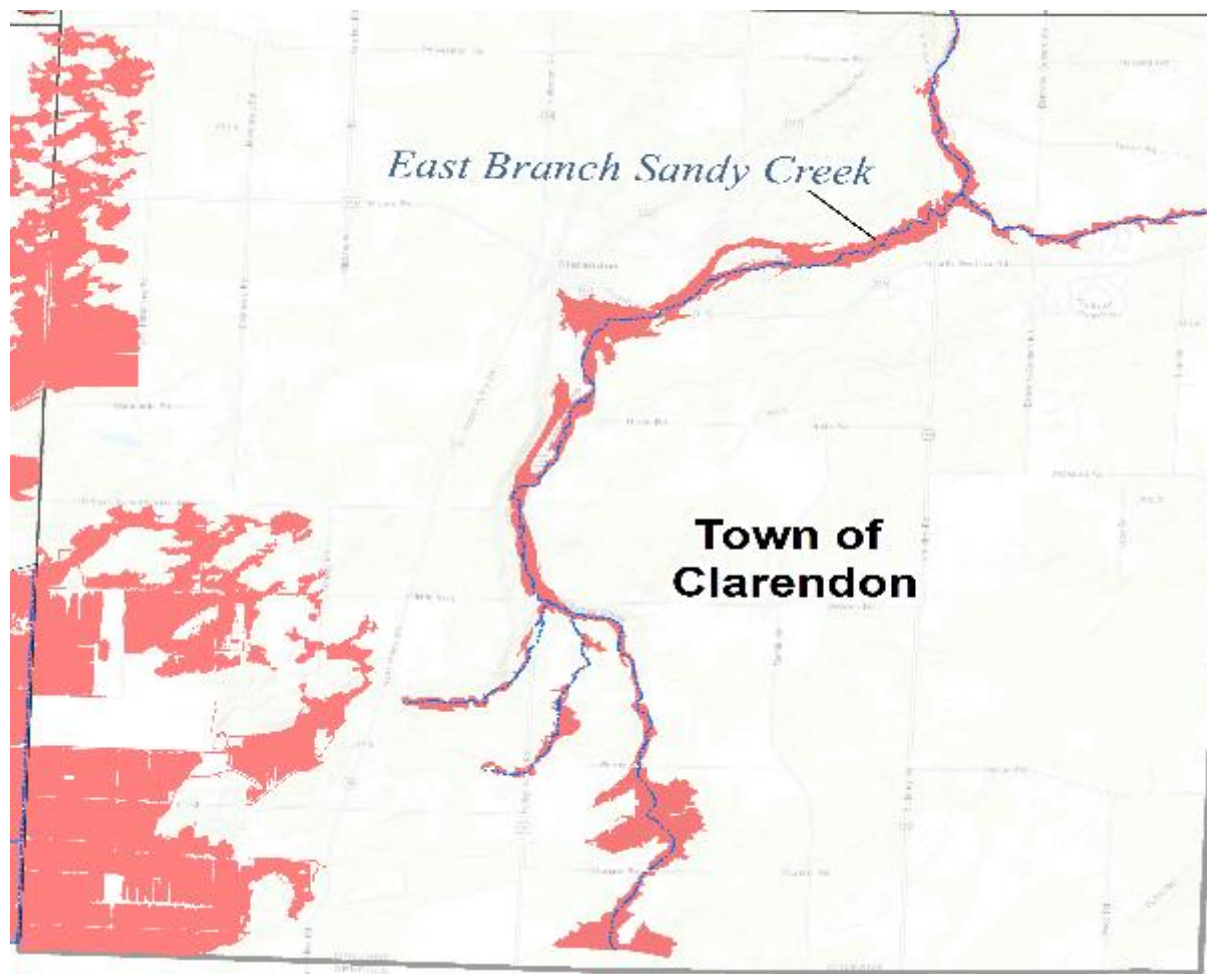


- Revised Approximate 100yr
- Revised Detailed 100yr
- Redelineated 100yr
- Effective 100yr



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Town of Clarendon



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What's Next?

Path Forward



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Next Steps

1

**Finalizing
Hydraulic
Analysis**

2

**Development
of Draft
Floodplain
Mapping/
Workmaps**

3

**Development
of Additional
Flood Risk
Products**

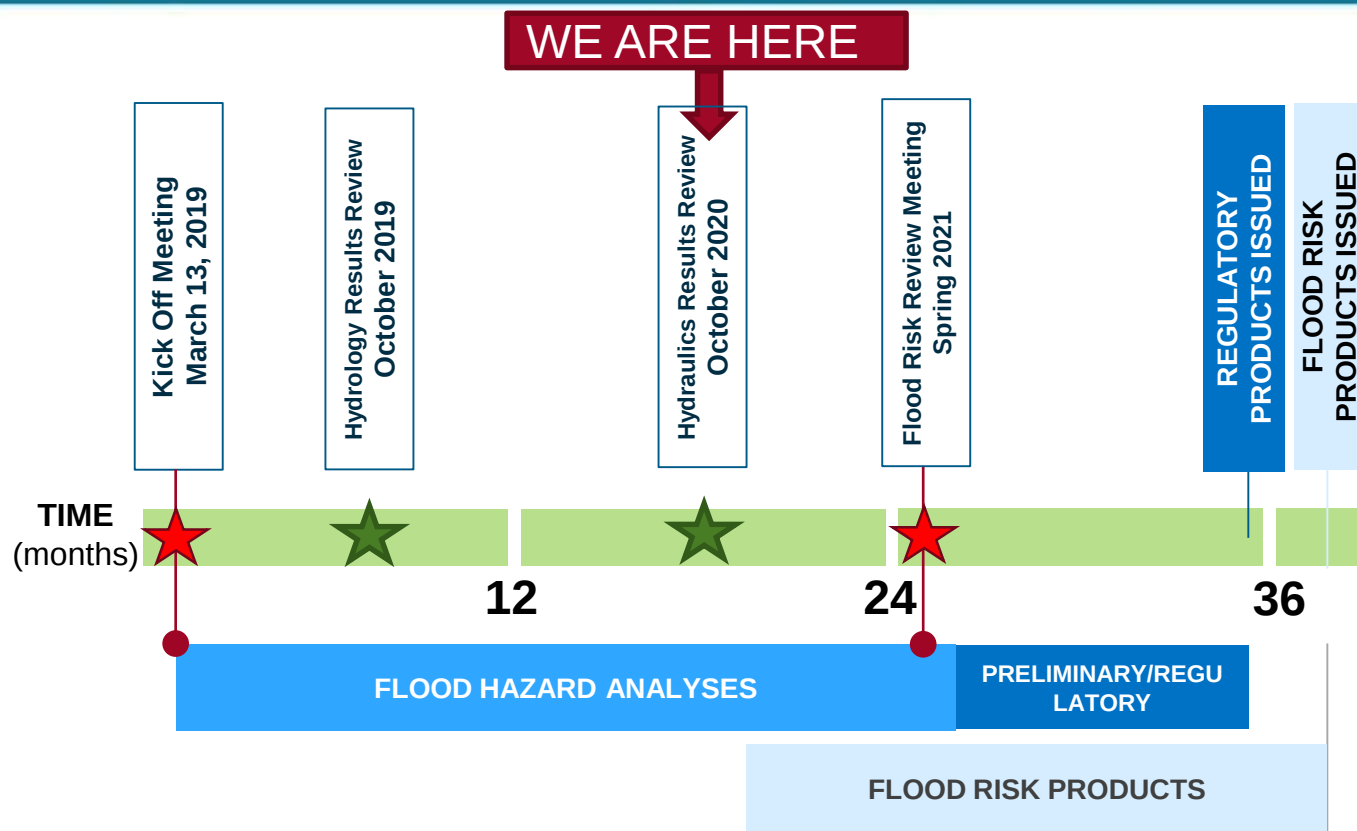
4

**Preliminary
FIRM
Issuance**



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Overall Flood Risk Project Timeline



Touchpoint - Webinar



Touchpoint – In person



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Contacts

FEMA

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Questions? Comments?



Thank you!



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