Building Olive's Flood Resiliency

Informed Flood Mitigation Planning

The Local Flood Analysis

Flood Advisory Committee

Meeting #1

Town of Olive's Community Room

4/14/15

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What is an LFA?

1. Uses science and engineering investigations to determine the conditions contributing to flood hazards of public and private infrastructure

2. Develop specific projects to mitigate these flood damages and hazards and identifies potential funding resources

3. Prioritizes these project's using technical merit, social acceptability and financial feasibility

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Why is LFA Important?

Got Flooding?

Flooding SR28 (Olive Firehouse in Background)

<u>More Rain 'A Comin</u>

- In the Northeast, annual precipitation amounts have increased by 3.3 inches over the last 100 years
- A 67% increase in the number of 2-inch rainfall events occurring over a 48-hour period since the 1950's.
- New York should expect an increase in average rainfall by:

  5% by 2020
  10% by 2050
  15% by 2080

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Why is Flooding Important

In Ulster County

- Town of Olive has 15.8% of its land in a Flood Hazard Zone (3rd highest in County, Hurley and Saugerties Village) and 12.3% of the town's value (UCHMP)
- 100 recorded flood events affecting the county that caused damage (1993-2008) (National Weather Service)
- 12 Presidential Declarations for flooding events have been issued for Ulster County (1953 to 2007).

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Where did the LFA come from?

The Town of Olive requested flood mitigation assistance.

The New York City Department of Environmental Protection provided funded

Through partnerships with many stakeholders the LFA was developed

Cornell University
Cooperative Extension
Ulster County

Soil and Water Conservation District
PO Box 667, 3130 Rt. 28, Shokan, NY 12481
5 Park Lane, Highland, NY 12528

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NEW YORK STATE OF OPPORTUNITY. Hudson River Valley Greenway

ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

What Can an LFA do for me?

1. It will inform you of the likelihood and consequence of a flood hazard impacting:

   Your home,

   Your commute to work/school,

   Your community (commerce, emergency response)

2. It will develop solutions to reduce flood damage related costs

3. If you have flood insurance: reduce annual premiums

4. Increase the competiveness for federal/state hazard mitigation grants reducing the need for raising taxes or obtaining municipal bonds.

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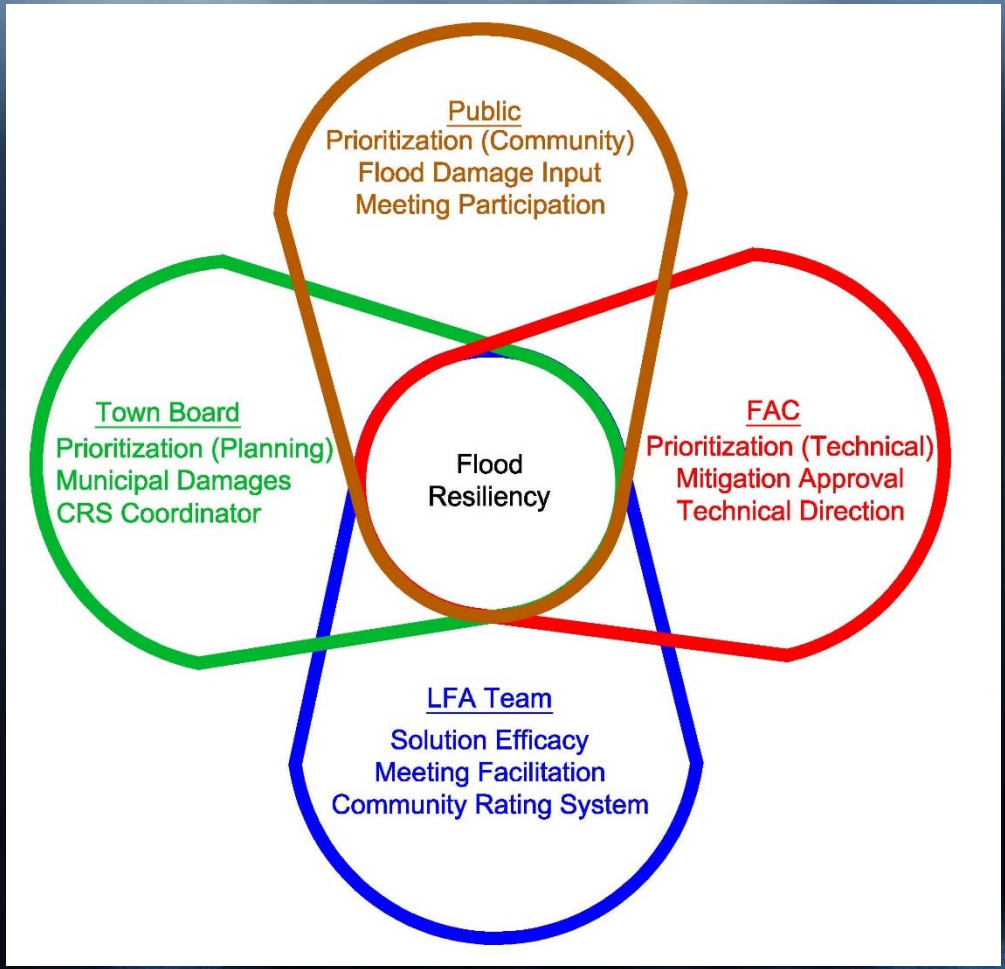
How Does the LFA Work?



Conceptual model describing relationship of LFA stakeholders

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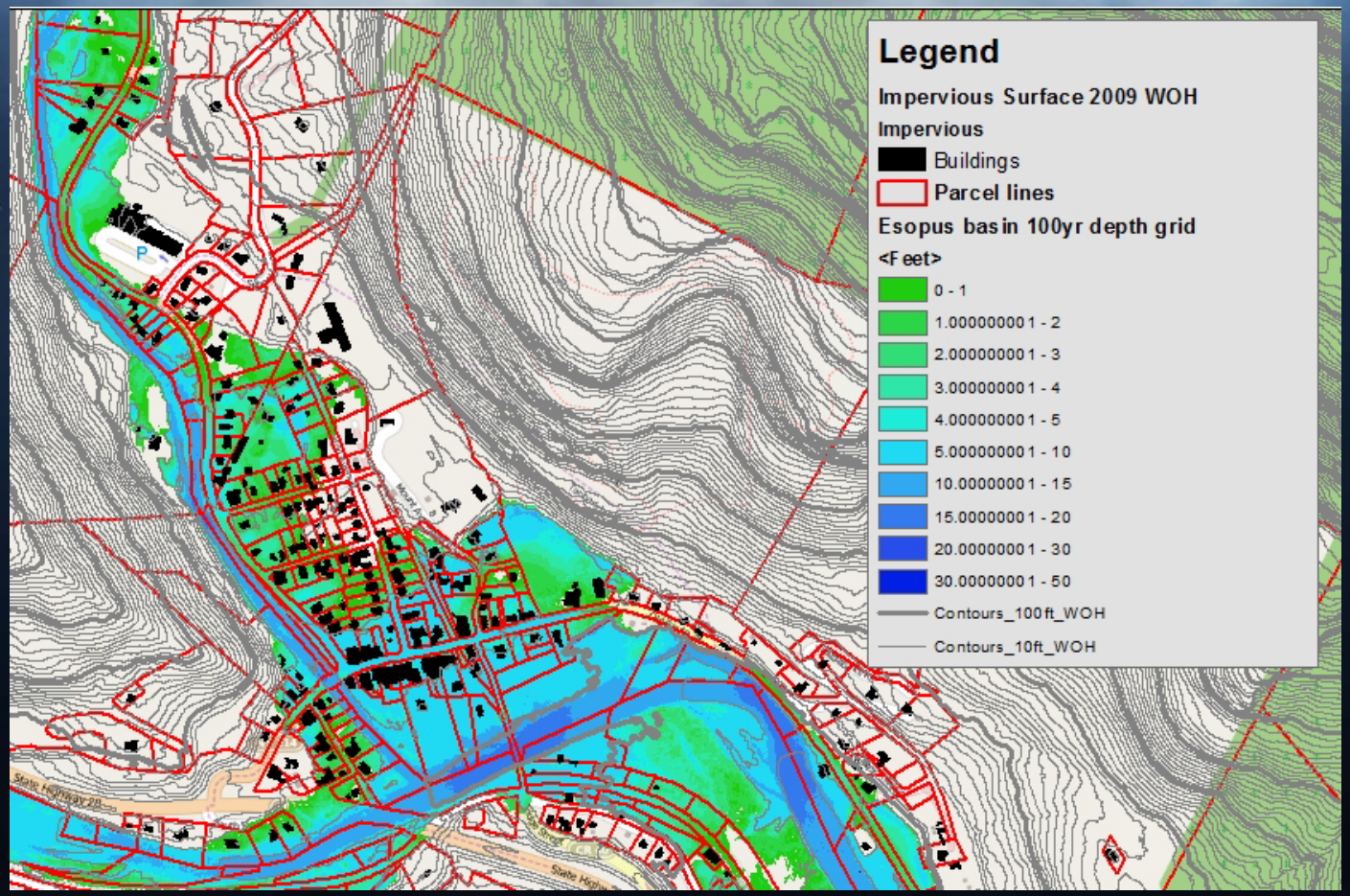
What does the LFA tell us?



<u>Depth Grids: Depth of water over land</u>

1. Where damage is greatest: (Deeper water (blue), more damage)
2. Identify mitigation opportunities

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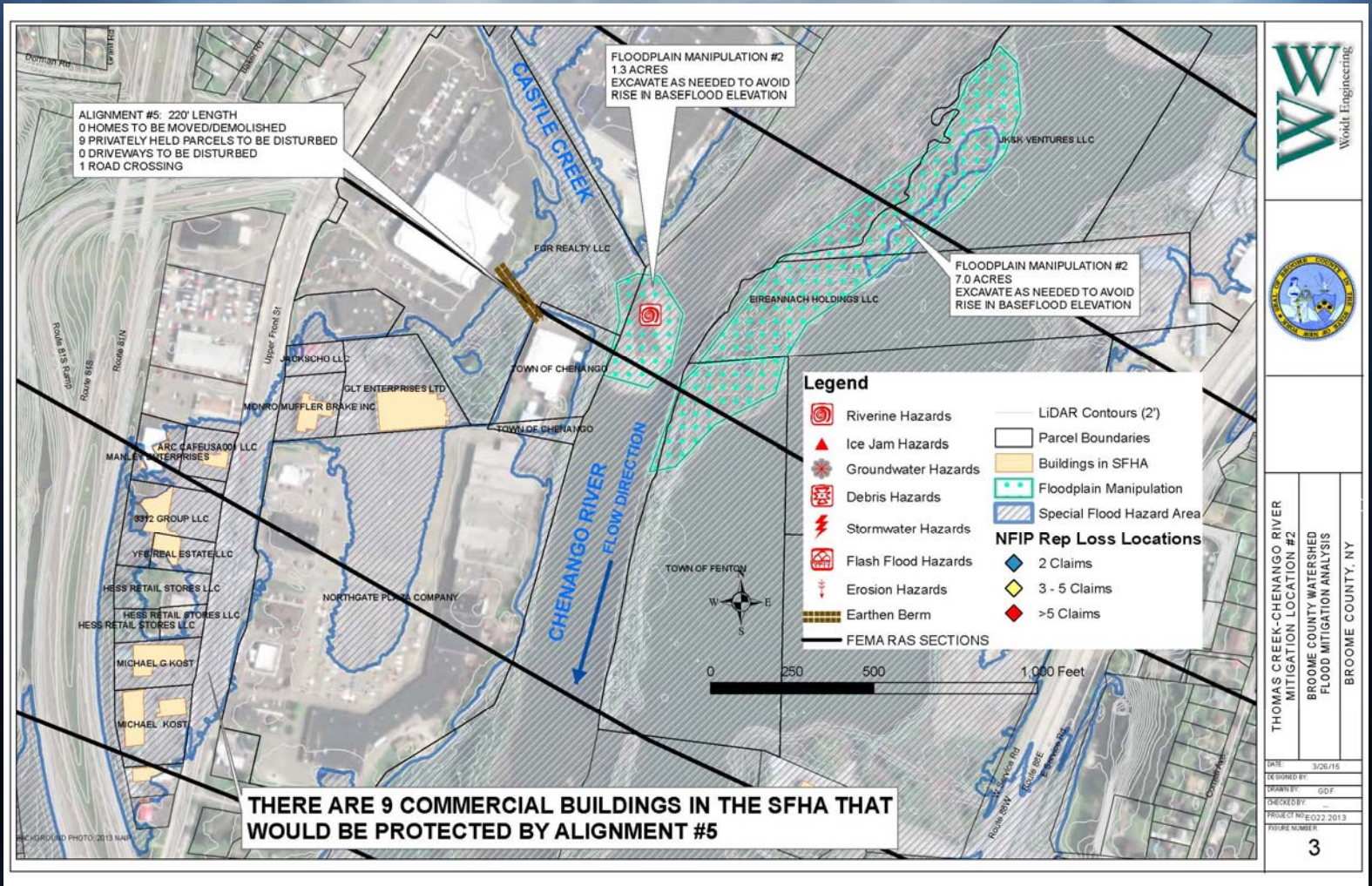
What does the LFA tell us?



Inundation extents

1. Identify mitigation opportunities: Flooding Fingers?

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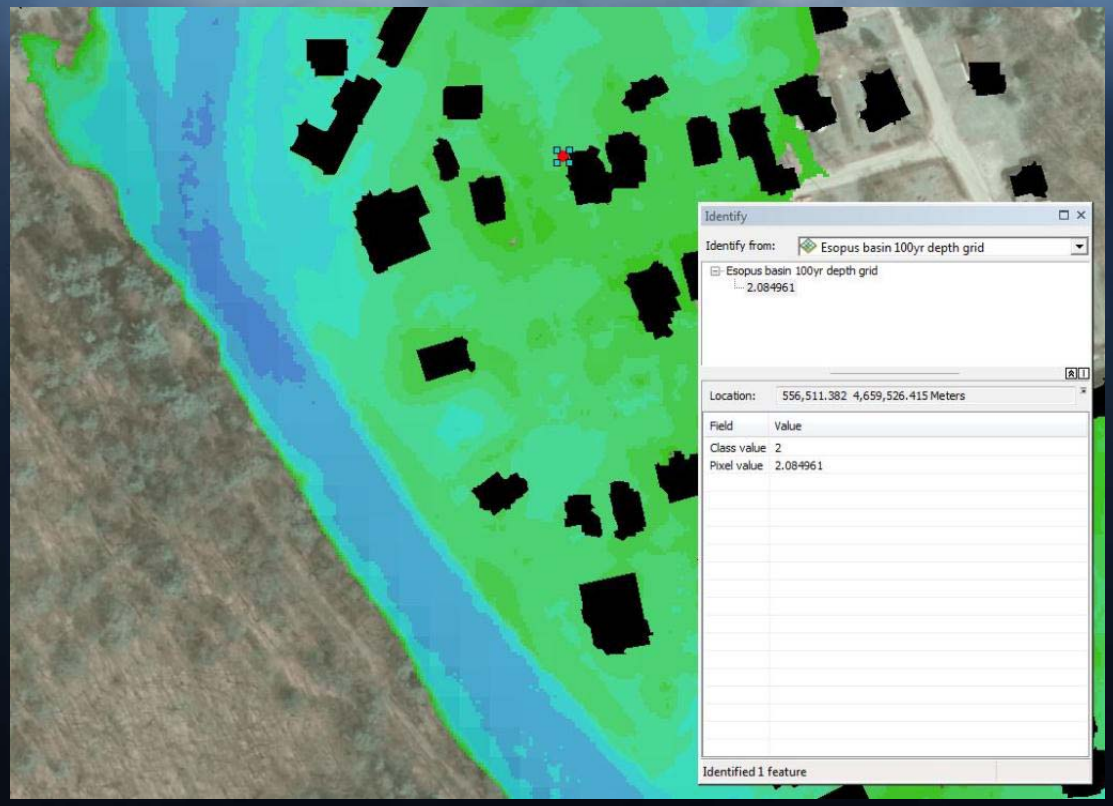
What does the LFA tell us?



<u>Inform Mitigation strategies</u>

1. Where is floodproofing practicable?
2. Where is flood buyout proactive

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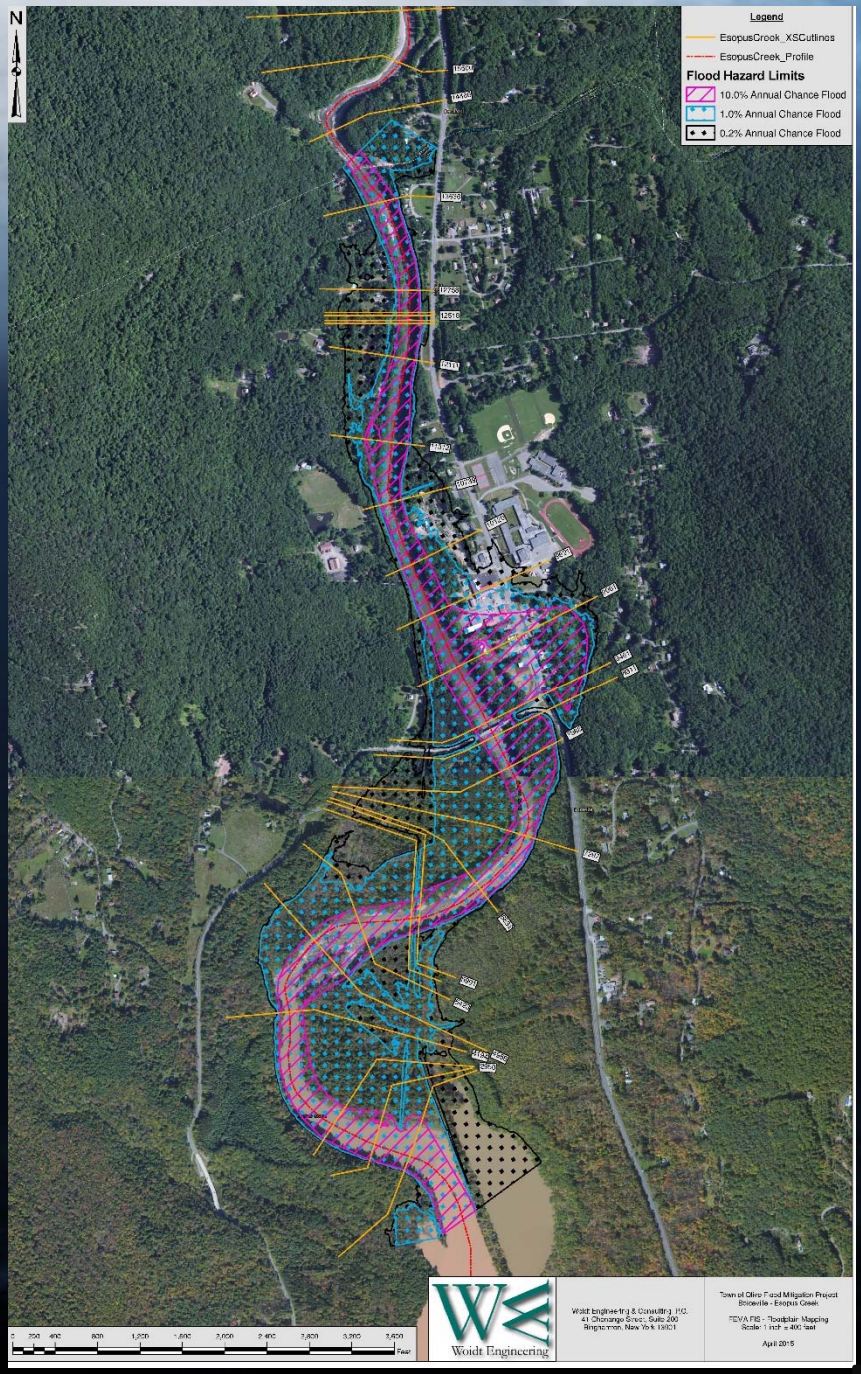
Where does the LFA Happen?



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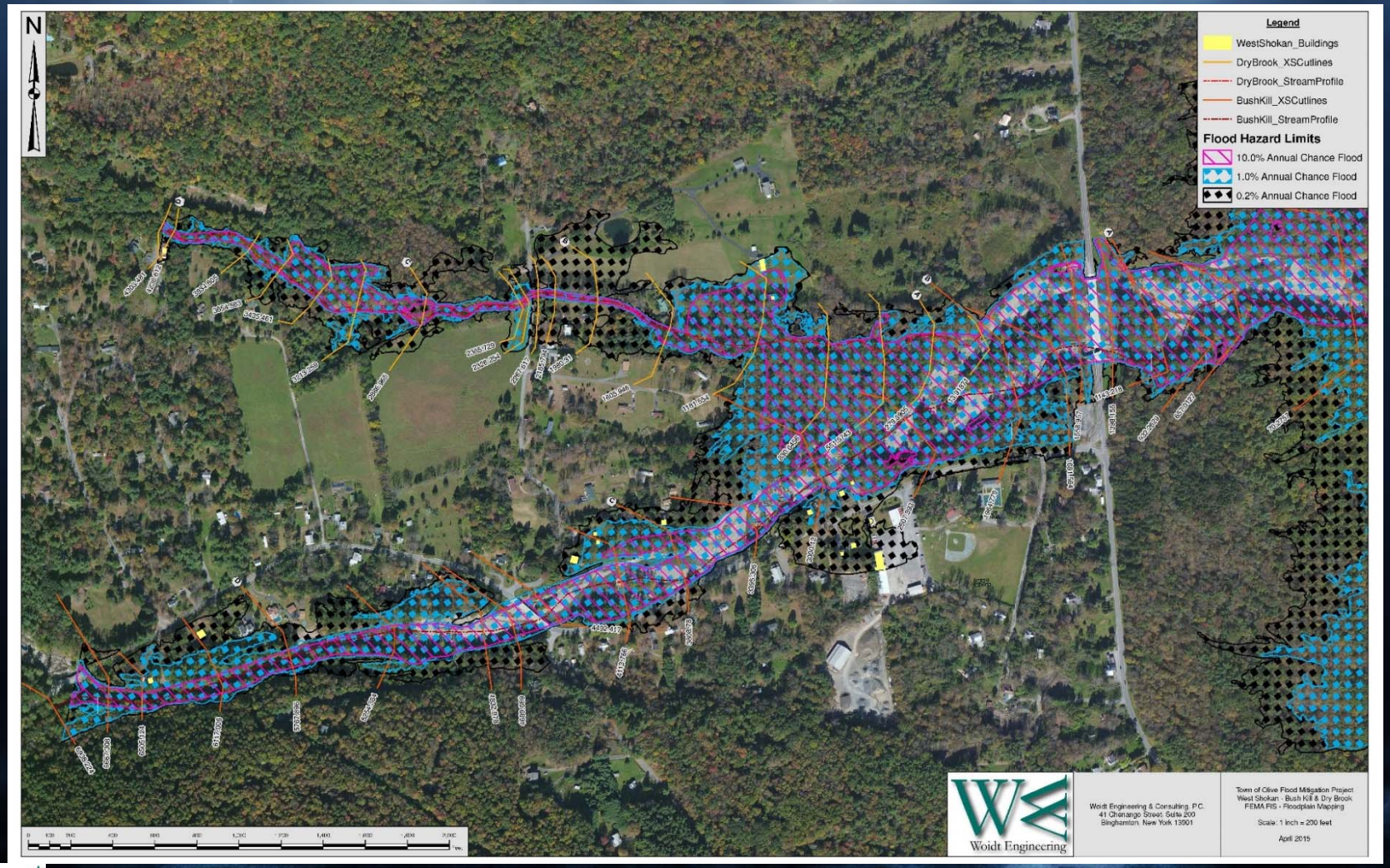
Where does the LFA Happen



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When does the LFA Happen

PROJECT	Town of Olive Local Flood Mitigation Analysis Schedule
DATE	4/3/2015

TASK		March	April	May	June	July	August	September	October	November	December	January
1	**Project Management, Coordination, and Meetings**											
1.1	Notice To Proceed											
1.2	Project Budget/Deliverables/Schedule Updates											
2	**Data Collection and Field Verification**											
2.1	Project Kick Off Meeting											
2.2	Review of In-House Data											
2.3	First Town Board Meeting,& Public Meeting, Flood Advisory Meeting											
2.4	Windshield Survey											
2.5	Draft Existing Data Gap Memo											
2.6	CCEUC Reviews Existing Data Gap Memo											
2.7	Second Town Board Meeting and Public Meeting, Flood Advisory Meeting											
2.8	Field Verification Of Existing Conditions											
2.9	Final Existing Data Gap Memo											
3	**Hydraulic Modeling of Existing Conditions**											
3.1	Prepare Duplicate Effective Model & Hydrology											
3.2	Prepare Inundation Maps, Hazard & Risk Analysis											
3.3	Prepare Draft Hydraulic Technical Memorandum											
3.4	CCEUC Reviews Draft Hydraulic Technical Memorandum											
3.5	Determine if Corrected Effective Model is Needed											
3.6	Prepare Final Hydraulic Technical Memorandum											
4	**Development and Evaluation of Mitigation Alternatives**											
4.1	Identify Potential Mitigation Areas, Benefit Cost Work											
4.2	Model Proposed Mitigation Conditions											
4.3	Third Flood Advisory Meeting											
4.4	Prepare Draft Mitigation Memorandum											
4.5	Third Town Board Meeting and Public Meeting											
4.6	Revise Mitigation Memorandum											
4.7	Review of Draft Mitigation Memorandum by CCEUC											
4.8	Prepare Final Mitigation Memorandum											
5	**Flood Engineering Analysis Report**											
5.1	Prepare Draft Flood Engineering Report											
5.2	CCEUC Reviews Draft Flood Engineering Report											
5.3	Prepare for the 4th Town Board and Public Meeting											
5.4	Facilitate 4th Town Board and Public Meeting											
5.5	Prepare Final Flood Engineering Report											
6	**Local Flood Mitigation Feasibility Analysis and Plan**											
6.1	Review and develop Town's floodplain ordinances											
6.2	Obtain acceptable documentation for damage costs (FEMA BCA)											
6.3	Complete BCA Ratio, summarize water quality benefits											
6.4	Update prioritization for mitigation activities, Draft LFHMP											
6.5	CCEUC Reviews Draft LFHMP											
6.6	Prepare Final LFHMP											
7	**Town Flood Hazard Mitigation Planning**											
7.1	Flood Advisory Committee Meeting											
7.2	First Public Meeting											
7.3	CRS Letter of Interest to FEMA Regional Office											
7.4	Repetitive Loss Mapping											
7.5	Flood Ordinances and Elevation Certificate Review											
7.6	CRS Quick Checklist Scoring											
7.7	Hazard and Risk Assessment											
7.8	Flood Management Plan for Repetitive Loss Properties											
7.9	Draft Flood Hazard Mitigation Plan											
7.10	CCEUC Reviews Draft Flood Hazard Mitigation Plan											
7.11	2nd Public Meeting											
7.12	Final Flood Hazard Mitigation Plan											

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When does the LFA Happen

Meeting/Event	Audience/Attendees	Objectives	Estimated Date	Actual Date
FAC Meeting #1	Woidt/Atkins FAC	- Review roles and responsibilities and timeline - Develop approach for soliciting public input on flooding (location, solutions) - Review FEMA effective model - Review flood extents and FEMA buyouts - Gather information from FAC about solutions to be modeled - Update on Five Arches Bridges project - Develop Prioritization approach	April 2015	
FAC Meeting #2	Woidt FAC	- Reconcile anecdotal flooding information with modeling results - Agree on feasible mitigation solutions using existing modeling results - Review Data Gap Analysis Memo, build consensus on field methodology - Discuss Benefit Cost Analysis and damage questioner - Identify educational materials for public meeting #3 - Review Town Flood Mitigation Plan priorities - Discuss and amend prioritization approach	June 2015	
FAC Meeting #3	Woidt FAC	- Review Proposed Mitigation Modeling conditions - Identify projects for advancing to Phase II Feasibility and Cost-Benefit Analysis using prioritization. - Review first-cut Benefit-Cost Analysis - Plan targeted outreach to anchor businesses and residents	August 2015	
FAC Meeting #4	Woidt	- Review final benefit cost-analysis - Review final draft LFA report - Discuss community outreach progress - Form funding committee and begin planning implementation funding	December 2015	

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When does the LFA Happen

Meeting/Event	Audience/Attendees	Objectives	Estimated Date	Actual Date
Public Meeting #1	Woidt/Atkins Public Town Board	- Review roles and responsibilities - Discuss the project timeline and LFA approach - Gather information from property owners about historic flooding, property damage and flooding solutions - Develop prioritization approach	April 2015	
Public Meeting #2	Woidt Public FAC	- Present findings on flood damage and flood extent under existing conditions - Discuss damage questioner and answer questions - Present education materials on common mitigation solutions - Present results and invite participants to weigh in on mitigation alternatives for the town of Olive	June 2015	
Public Meeting #3	Woidt/Atkin Public FAC	- Present results and invite participants to weigh in on mitigation alternatives	September 2015	
Public Meeting #4	Woidt Town Board Public FAC	- Present final project analysis and results to the public - Begin SEQR for Town-selected projects that will move forward to funding - Begin funding applications - Review final draft Town-wide mitigation plan	December 2015	

-Meetings are scheduling milestones when important interim steps are completed

-Damage questioners will be made available, timely response is important to the schedule

-Coordination between Town Board, and Public will be managed by CCUC

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The Community Rating System

- Jacob Tysz, CFM

What is the Community Rating System (CRS)?

- Available to most communities participating in the National Flood Insurance Program (NFIP)
- Voluntary
- Rewards communities that do MORE to protect their residents
- Program is similar to the insurance industry's grading of Fire and Building Codes Enforcement

Goals of the CRS

- Reduce Flood Damage
- Strengthen and support Flood Insurance
- Encourage ***Comprehensive*** Flood Management
- Build a ***Constituency*** for Comprehensive Floodplain Management in the Community

Who Can Join the CRS?

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- What does it take to join?
  - *In consultation with the FEMA Regional Office or State*
- At least one year in the NFIP
- In good standing in the NFIP

Who is the CRS today?

- Currently about 5.5% of all NFIP communities nationwide are participating in the CRS.
- Those 5.5% represent nearly 68% of NFIP of all NFIP policies!

- State Leaders
  - FL 216
  - CA 83
  - NC 81
  - NJ 59*
  - TX 54

CRS Classes	Percentage of Communities Participating in CRS by Class (nationwide)
1 through 4	0.9%
5 through 7	43.26%
8 and 9	55.83%

NYS CRS Classes (as of October 2014 Cycle)	Percentage of Communities Participating in CRS by Class
1 through 6	0 (0%)
7	2 (5%)
8	14(34%)
9	12(29%)
10	13 (31%)

What are the Types of Flooding Hazards are We Looking For?

Overbank Flooding

A location where overflow from a river, stream or creek channel. This flooding occurs when the water overtops its banks …. and often results in a federal disaster declaration. This type of flooding generally occurs more than six hours after peak rainfall.

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What are the Types of Flooding are We Looking For?

STORMWATER:

Flooding resulting from insufficient capacity or lack of a stormwater drainage infrastructure. This includes bridges, culverts, roadside ditches, catch basins and piping systems. Flood water enters an area and cannot leave rapidly causing undesirable water depths.

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What are the Types of Flooding are We Looking For?

Erosion

A location where rushing water has removed the linings of the stream channel posing a risk to infrastructure or poor water quality. This may or may not result in the creek shifting its alignment.

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What are the Types of Flooding are We Looking For?

DEBRIS JAM FLOOD:

Wood debris or bedload debris that reduce the capacity of water corridors, bridges, culverts (etc.) that causes unwanted flooding by either filling in the channel (aggradation) or plugging openings.

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Flood Advisory Committee
LFA Technical Session
Modeling Approach

FEMA HEC RAS Model and HEC HMS

Hydraulic Analysis Technical Support Data Notebook

Task Order HSFE02-11-J-0001 for Esopus Watershed Hydraulic Study, New York
FEMA Contract No. HSFEHQ-09-D-0369

June 2013

FEMA

Federal Emergency Management Agency Region II
26 Federal Plaza, Suite 1337
New York, NY 10278

Hydrologic Analysis Technical Support Data Notebook

Task Order HSFE02-10-J-0001 for Ashokan Reservoir Watershed Hydrologic Study, New York
FEMA Contract No. HSFEHQ-09-D-0369

August 2012

FEMA

Federal Emergency Management Agency Region II
26 Federal Plaza, Suite 1337
New York, NY 10278

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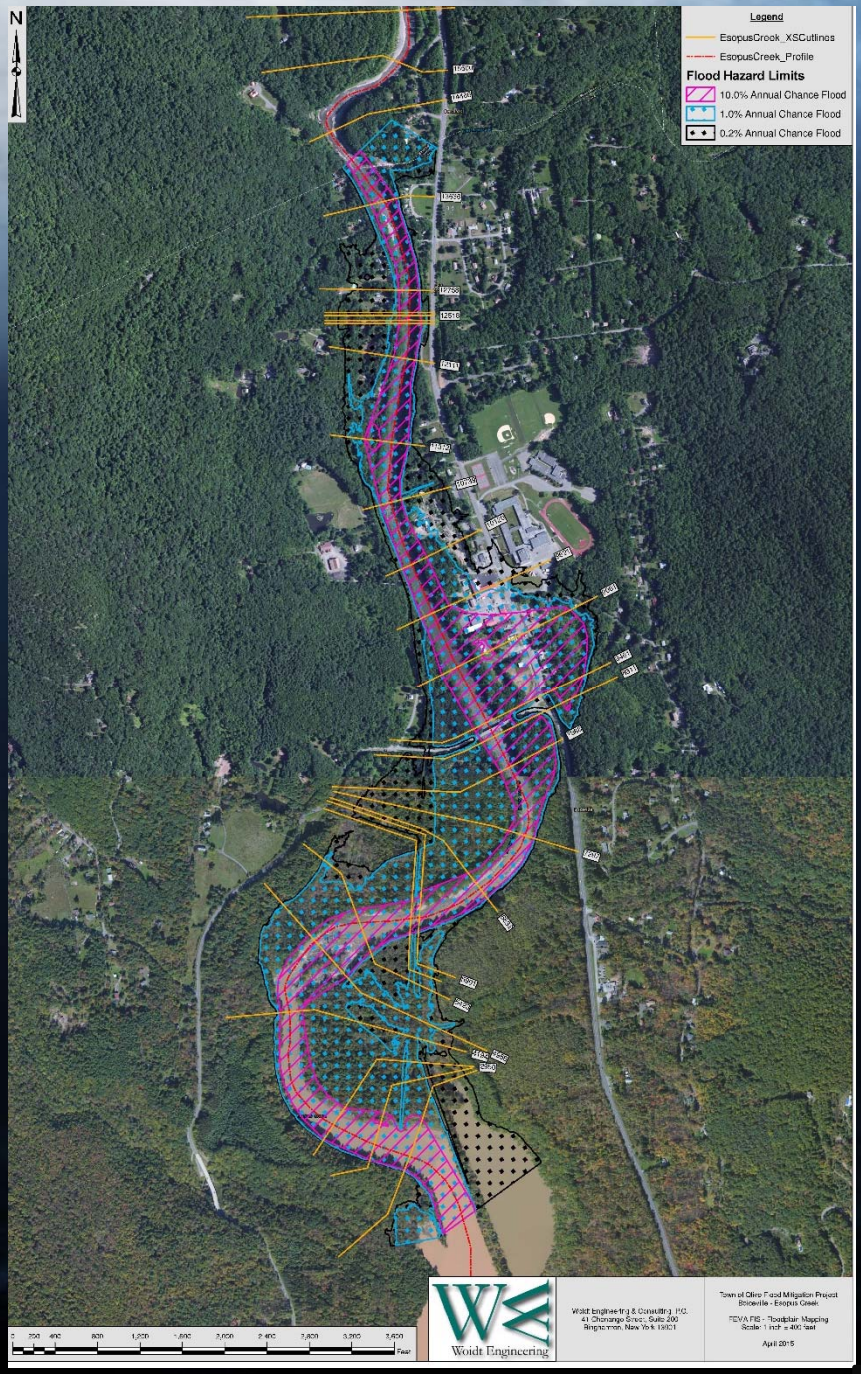
Where does the LFA Happen?



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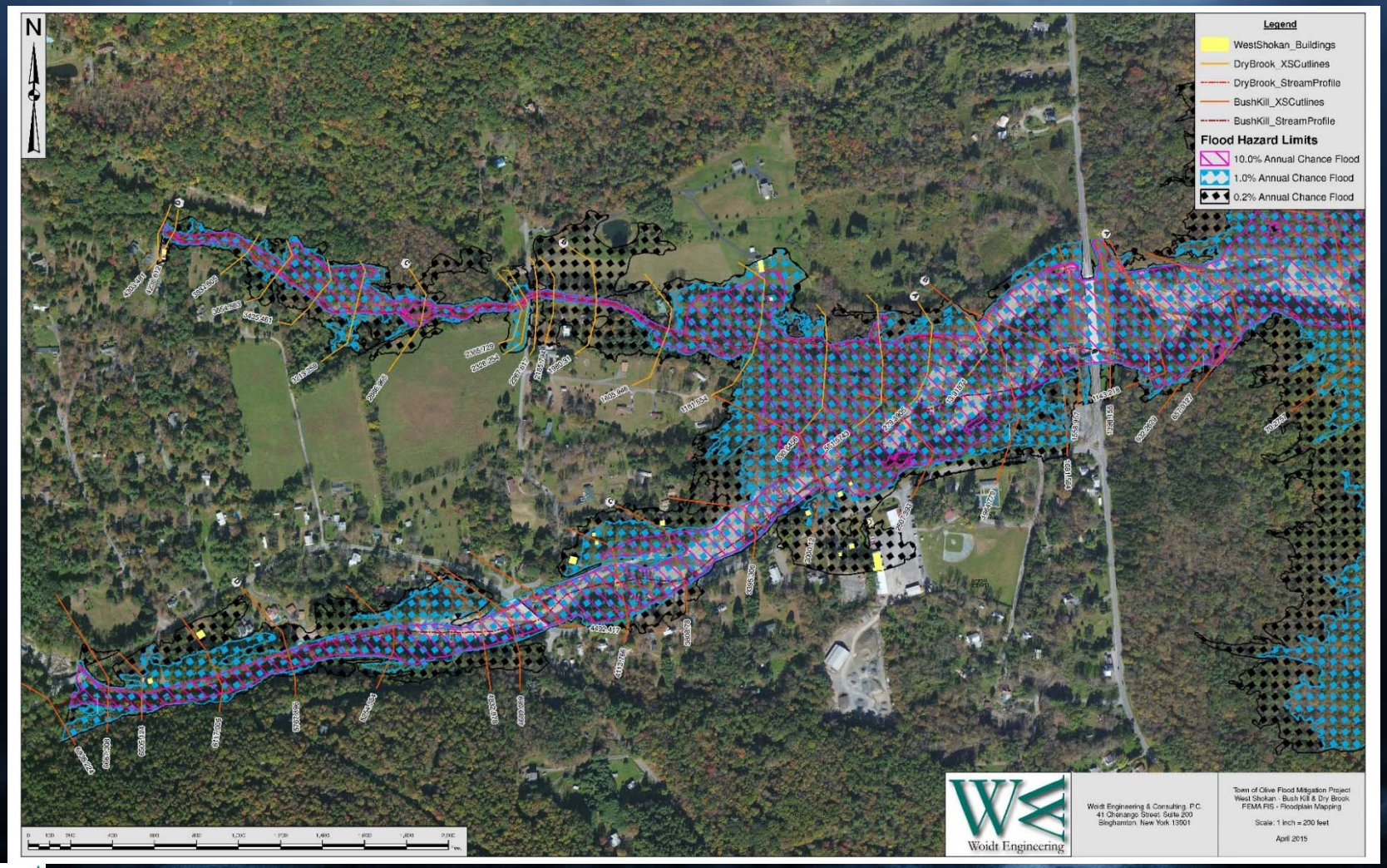
Where does the LFA Happen



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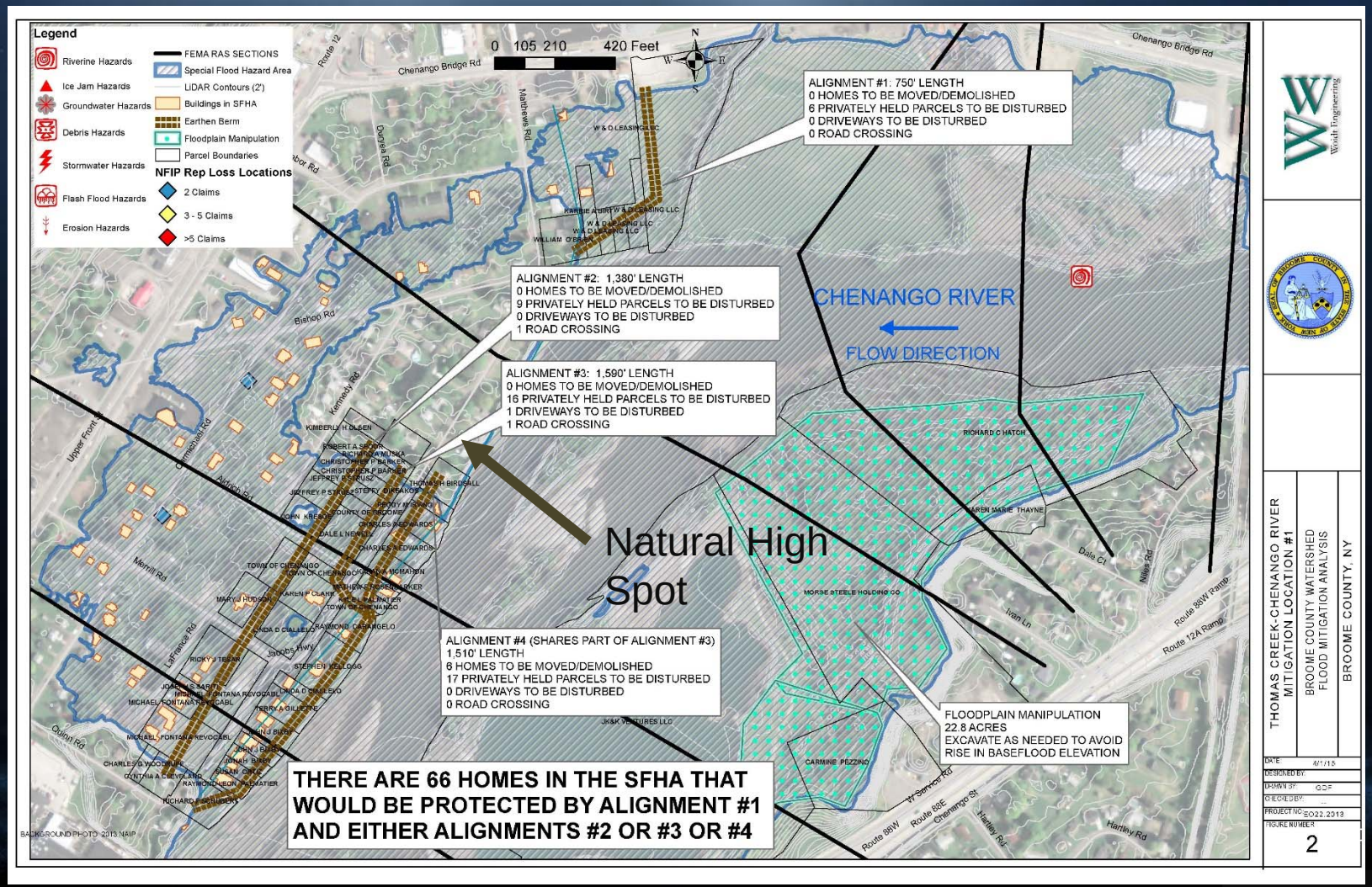
Flood Advisory Committee
LFA Technical Session
Modeling Approach



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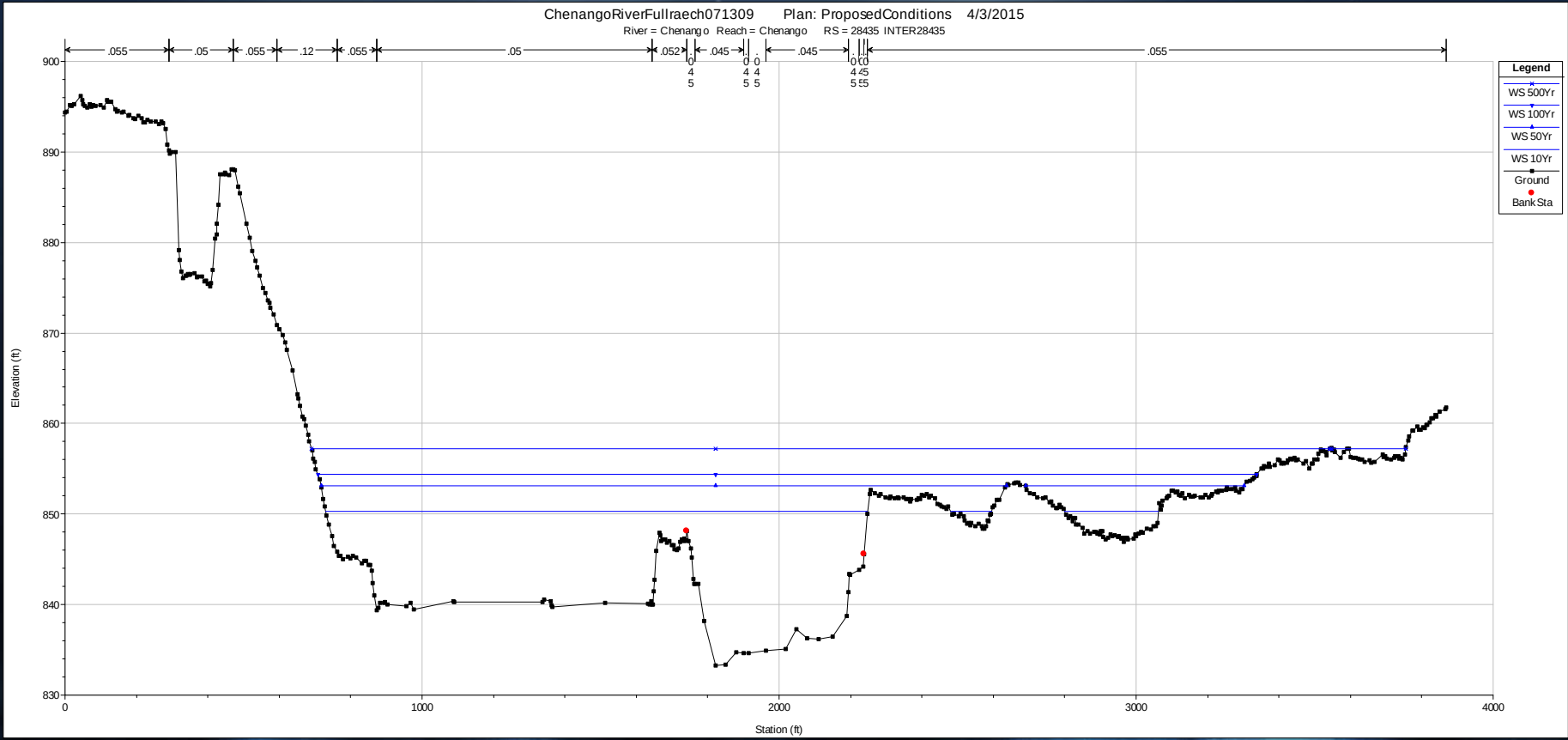
Flood Advisory Committee
LFA Technical Session
Modeling Approach



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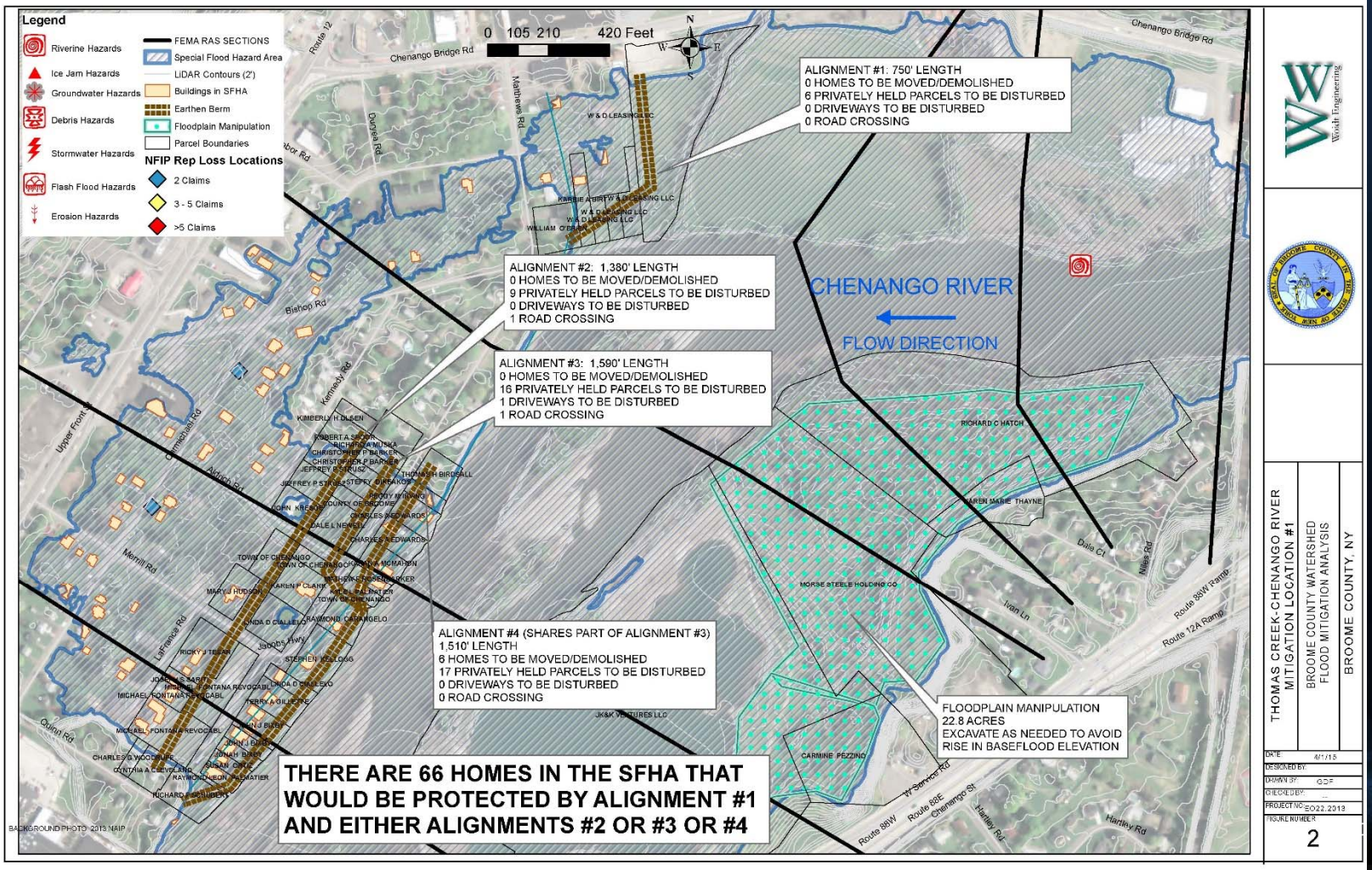
Flood Advisory Committee
LFA Technical Session
Modeling Approach



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Flood Advisory Committee
LFA Technical Session
Prioritization Approach

Refer to Agenda

Benefit Cost Analysis
Damage Questioner

NYS Division of Homeland Security & Emergency Services

Benefit Cost Analysis (BCA) for Hazard Mitigation Projects
Section 404 HMGP – PDM – FMA

The Federal Emergency Management Agency (FEMA) requires that Mitigation projects be cost effective, or result in savings that exceed their cost. This can be found in 44 CFR Part 206.434(c)(5), and it is achieved by performing a Benefit-Cost Analysis (BCA) that results in a Benefit-Cost Ratio (BCR) of 1.0 or greater. BCAs are completed using FEMA software to inventory and document past damages and calculate the value of damages avoided or reduced if the project is implemented.

When compiling data for the BCA, it's helpful to think of mitigation benefits as future damages and losses that would be eliminated and/or reduced by implementing the proposed mitigation project. The following categories of avoidable or reducible damages---while not exhaustive---offer a good starting point and should be considered when gathering data for the BCA Information Worksheet:

- **Casualties**: deaths, injuries, and illnesses;
- **Physical Damages**: buildings, contents, infrastructure, landscaping, site contamination, vehicles, and equipment;
- **Loss of Function**: displacement costs, loss of rental income, loss of business income, lost wages, disruption time of residents, loss of public services, loss of utility services, and the impact of road and/or bridge closures;
- **Emergency Management**: costs for emergency operations centers, evacuations and rescues, security, temporary protective measures, and debris removal and cleanup.

New York State Division of Homeland Security and Emergency Services (DHSES) has prepared a worksheet to assist with the BCA portion of the mitigation application. While this is intended to address most mitigation challenges, your situation may be unique and worth discussing with DHSES program and technical staff to ensure all eligible damages are considered. We also may ask questions or request additional documentation to fully understand the existing problem and your proposed solution, capture all damages, and present your project to FEMA in the most positive light. In order for DHSES to prepare an accurate BCA, please remember that:

- Damages, losses and costs must be documented to be considered in the BCA;
- Information on damages or losses must be related directly to the particular problem the proposed project is intended to prevent or mitigate (e.g. in a culvert failure and flooding scenario, include your costs of emergency measures, clean-out, etc., as well as associated damages to surrounding private properties located off your right-of-way);
- FEMA recognizes only monetary losses, and events or activities that cannot be assigned a monetary value cannot be included in the BCA. However, dollar figures can be correlated with certain casualty situations, loss of service, and road closures, so you should contact us if you have any questions about the eligibility of your losses.

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Should Olive Join the CRS?

- Should you join the CRS?
  - If **yes**, what will it cost?
  - How will program be funded?
  - Who will lead your CRS effort? Will you have a "champion" for the program in your community?
  - What do you already have in place to build your CRS program on?

Photo credit: Hasbro

Municipal Responsibilities? (short term)

- Community Quick Check
- CRS Letter of Interest to FEMA Region II
- Community Assistance Visit (CAV)
- Elevation Certificates now mandatory (for property in SFHA)
- Full Flood Insurance Coverage of town-owned structures
- Repetitive Loss Plan (?)

Municipal Responsibilities? (long term)

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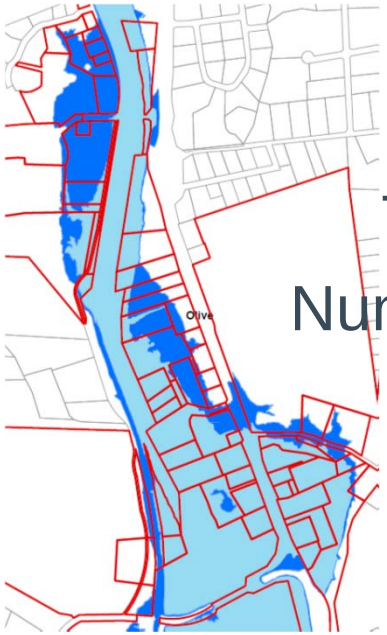
- CRS Coordinator
  - “Champion” for CRS program in town; Public Outreach; Coordination with other town staff/departments
- Training
  - Elevation Certificates; Reading/Interpreting FIRMs; CFM
- Outreach
  - Flood Insurance, Mitigation, Awareness
- Recordkeeping
  - Maintenance of tracking sheets, Outreach efforts and materials, Other compliance records
- Local Ordinance, Land Use Law, Planning, and Codes
  - Update, strengthen, and maintain, as needed

What about Olive?

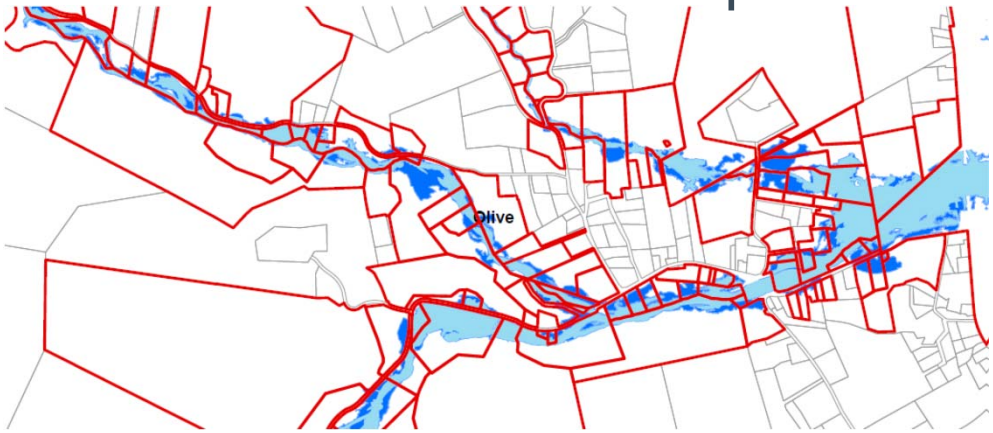


Number of policies = 50

Average premium = +/- $1500.00

Total Yearly town payments = $77,300.00

Number of properties in SFHA = +/- 350 parcels



Summary

Estimated savings (collectively) over **5** Years for the approximately 50 flood insurance policy holders in Olive if the town achieves a **Class 8** approximately:

$34,000.00

However, at a **Class 7**, the estimated savings over **5** Years for town flood insurance policy holders would be approximately:

$51,000.00

More Insurance = Faster Recovery

Photo credit:

Next Steps

Continue Existing Data Review and check modeling coverage for possible flooding and mitigation areas

Develop Data Gap Memo, identify holes in data that will increase understanding of existing flooding sources and for information mitigation solutions.

Customize Flood Damage Questioner

Flood Advisory Meeting #2

Town Board and Public Meeting #2

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Questions?

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