Woodard & Curran

Understanding Flood Risks: Climate Data & Projections

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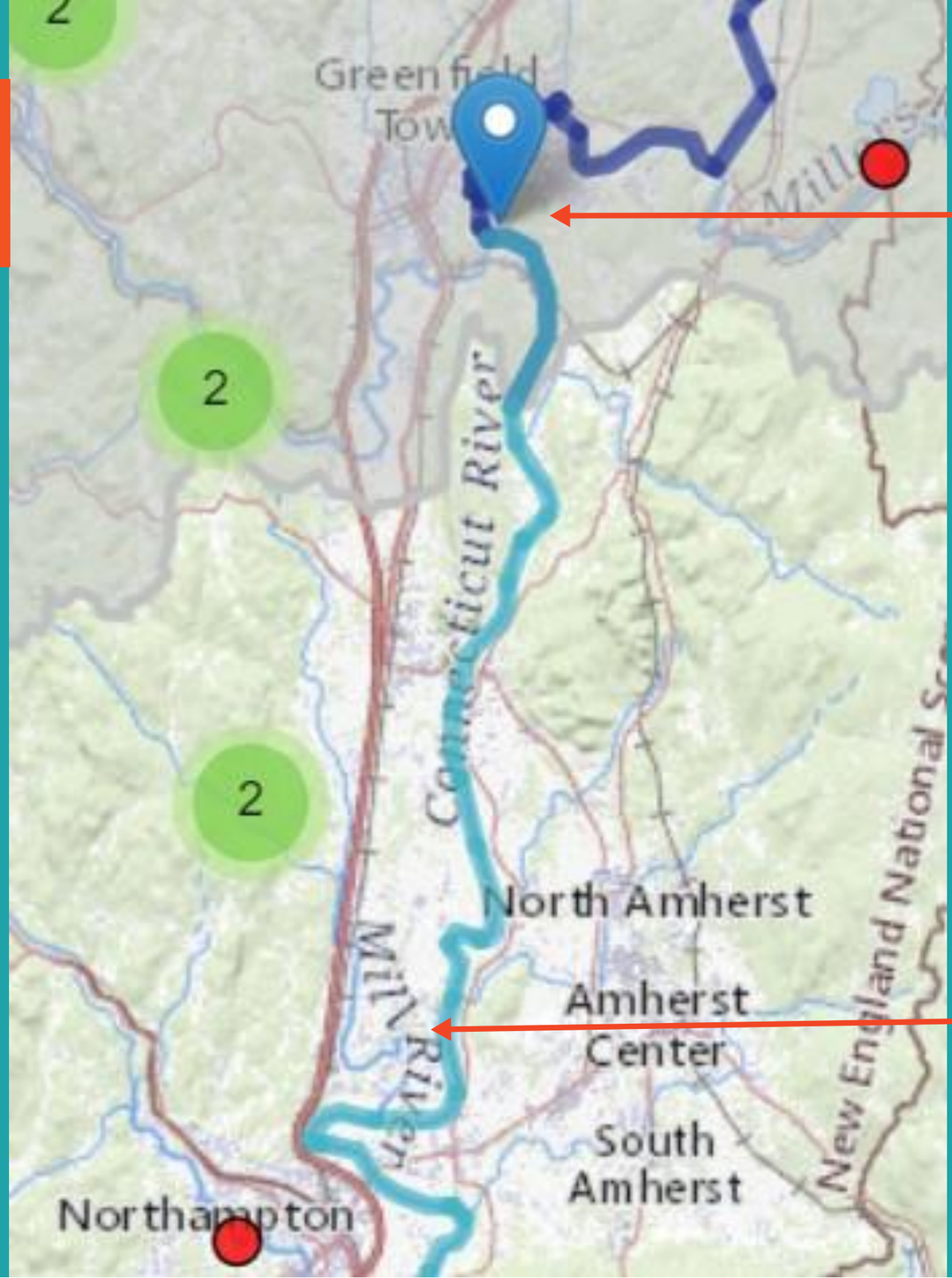
Current Conditions
Flood Risk

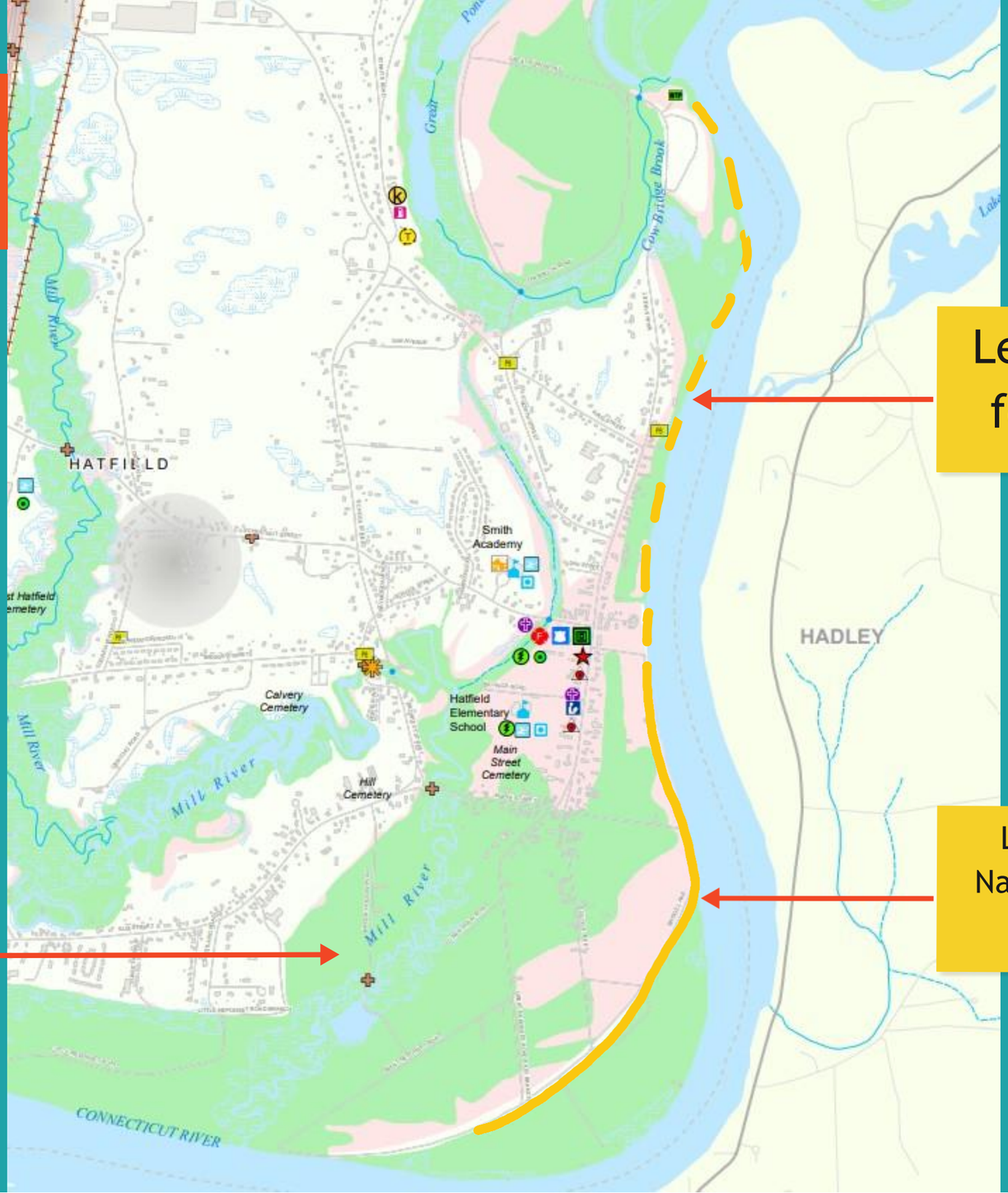
- Historic peak flows at Montague City river gage 01170500
- USGS est. 1% AEP 181,000 0.2% AEP 218,000
- FEMA Base Flood Flow = 180,000 cfs

YEAR	HIGHEST FLOW (cfs)
1936	236,000
1938	195,000
1928	179,000
1913	144,000
1984	143,000
1960	142,000
1949	139,000



Current Conditions
Levee

- Constructed following 1936 and 1938 floods
- Provides flood protection for a limited area
- Mill River backwater floods behind levee



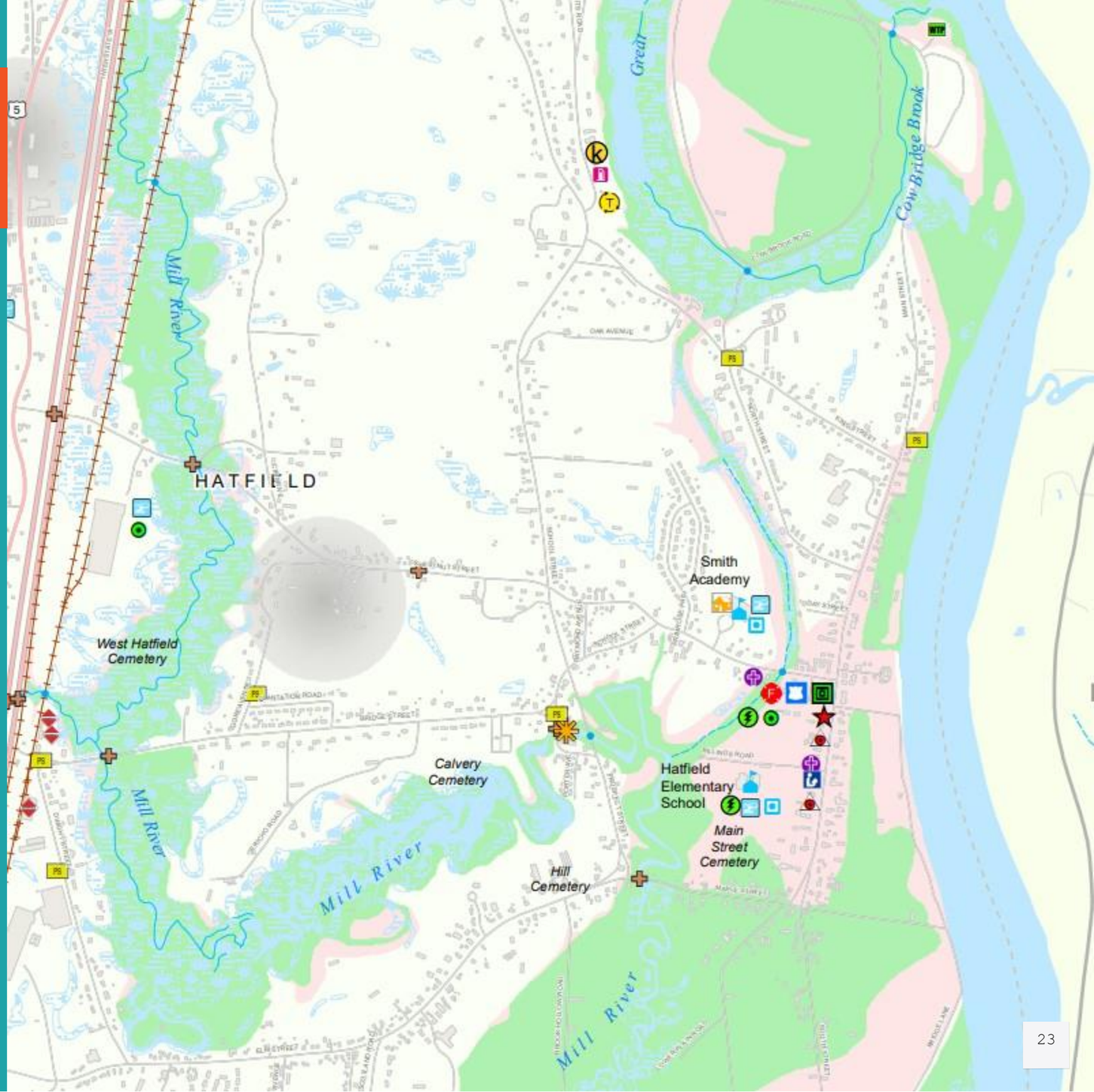
Levee-like features

Levee from National Levee Database

Green = FEMA Base Flood

Critical Infrastructure From Hazard Mitigation Plan

- Fire Station
- Police
- Primary Emergency Operations Center
- Town Hall
- Hatfield Elementary School
- Library
- Church
- Helicopter Landing Zone
- Utility Infrastructure
    - Emergency Electrical Power
    - Pumping Station
    - Culverts
- Bridge
- Significant Hazard Dam
- Historic Place Recreation
- Areas

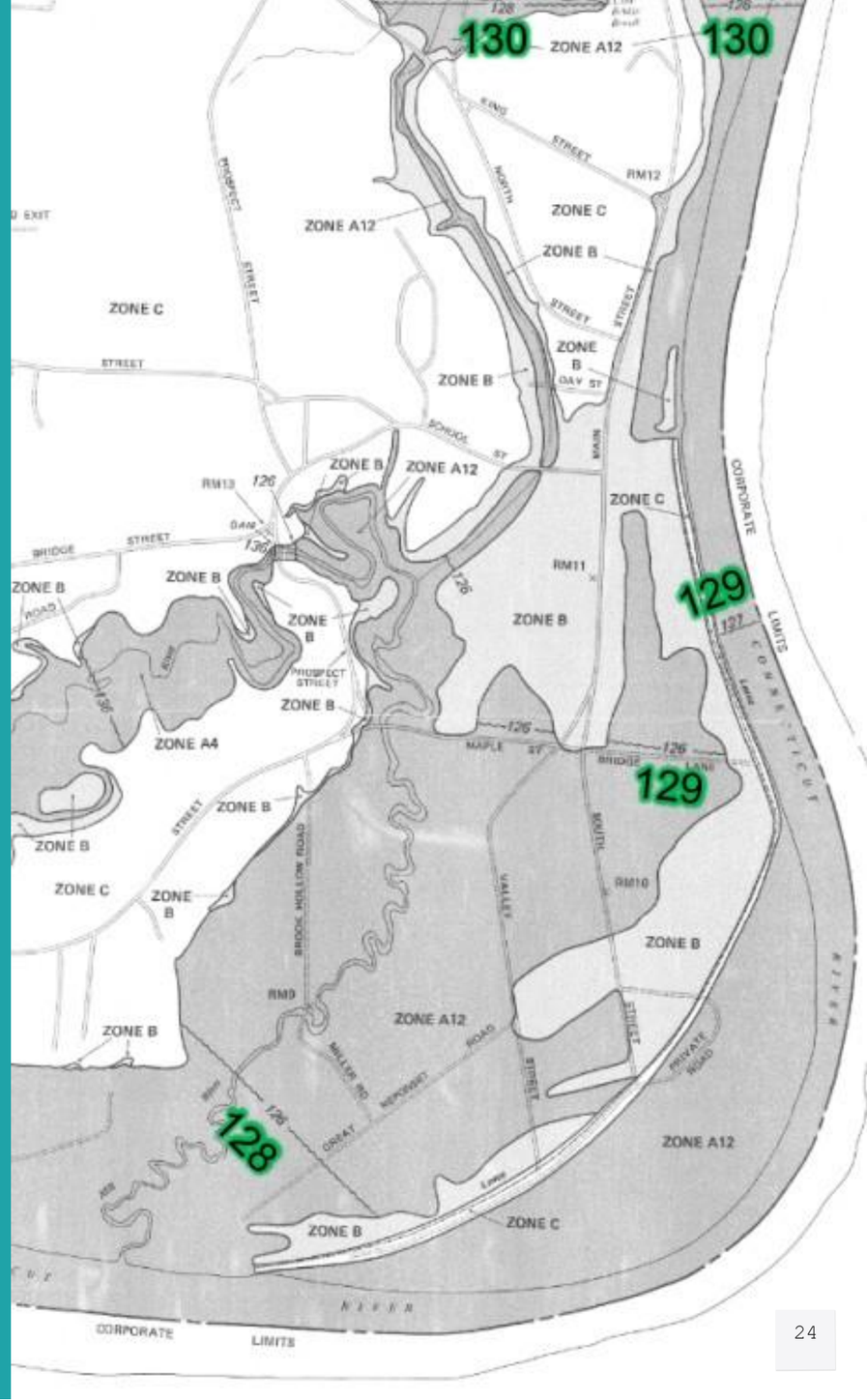


FEMA Regulatory Context Potential Impacts

- Updated Base Flood Flow = 182,000 cfs
- Levee does not offer protection
- 2-to-3-foot increase in BFE

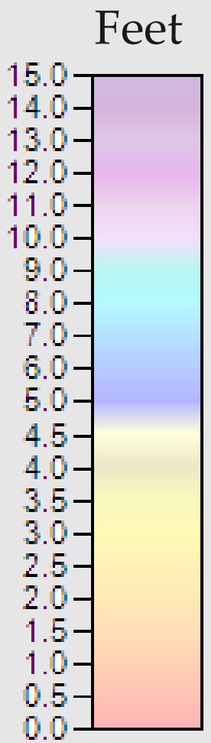
Current Base Flood Limit

Updated Flood Base Limit



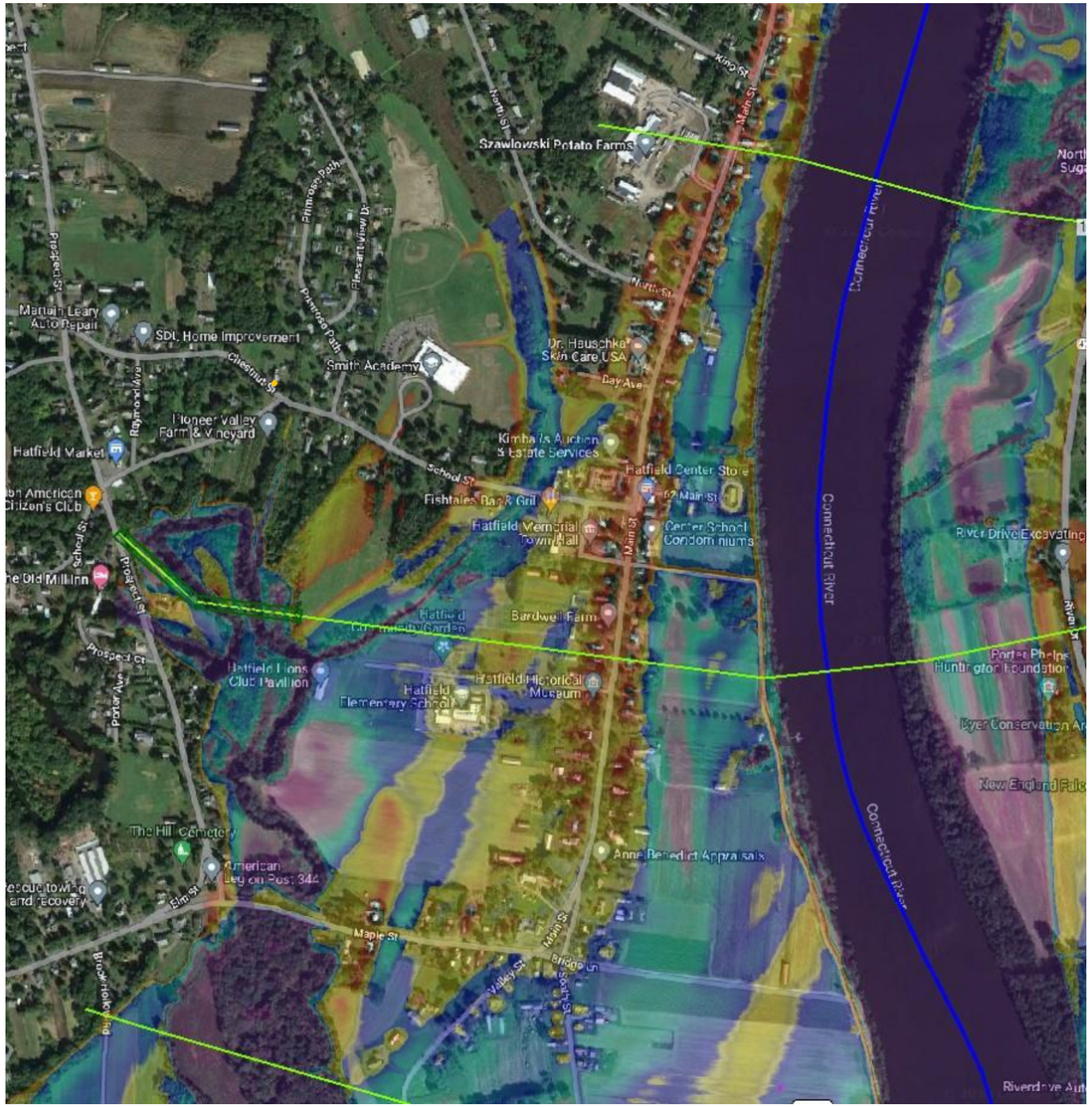
Review of Flood Scenarios
Future Flow Consideration

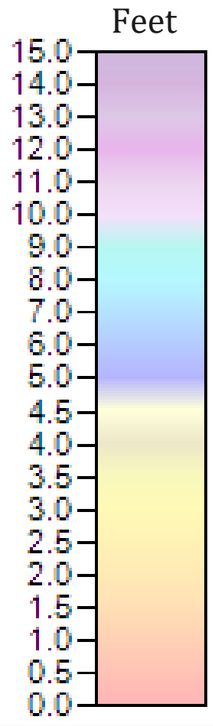
- 182,000 cfs = FEMA updated base flood flow
- 15% increase in future flows (through year 2100)–using % change from 2019 UMass-MassDOT study
- 209,300 cfs = future flow scenario



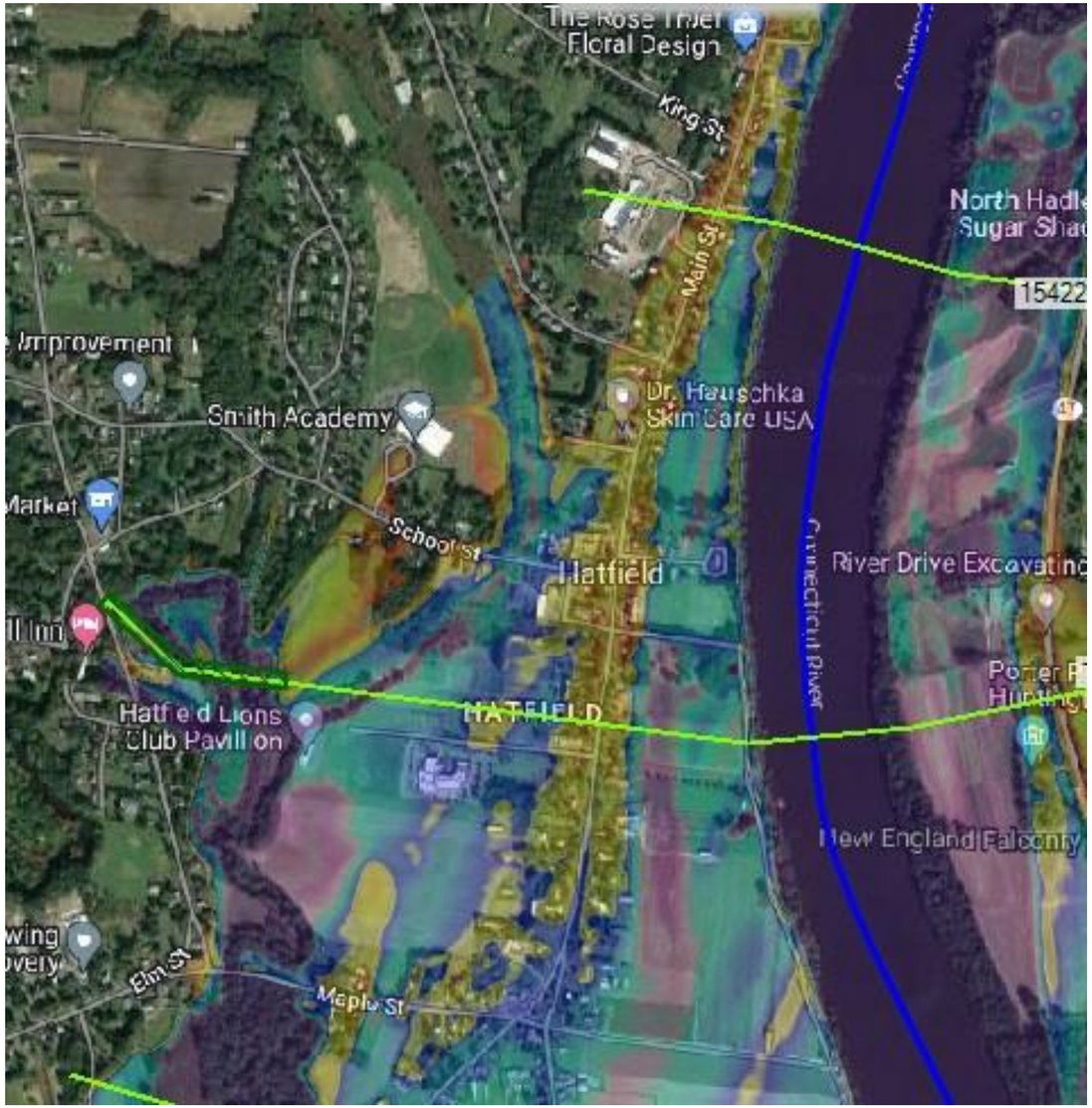
Future Conditions

182,000 cfs | FEMA Base Flood Scenario





209,300 cfs | Future Base Flood Scenario



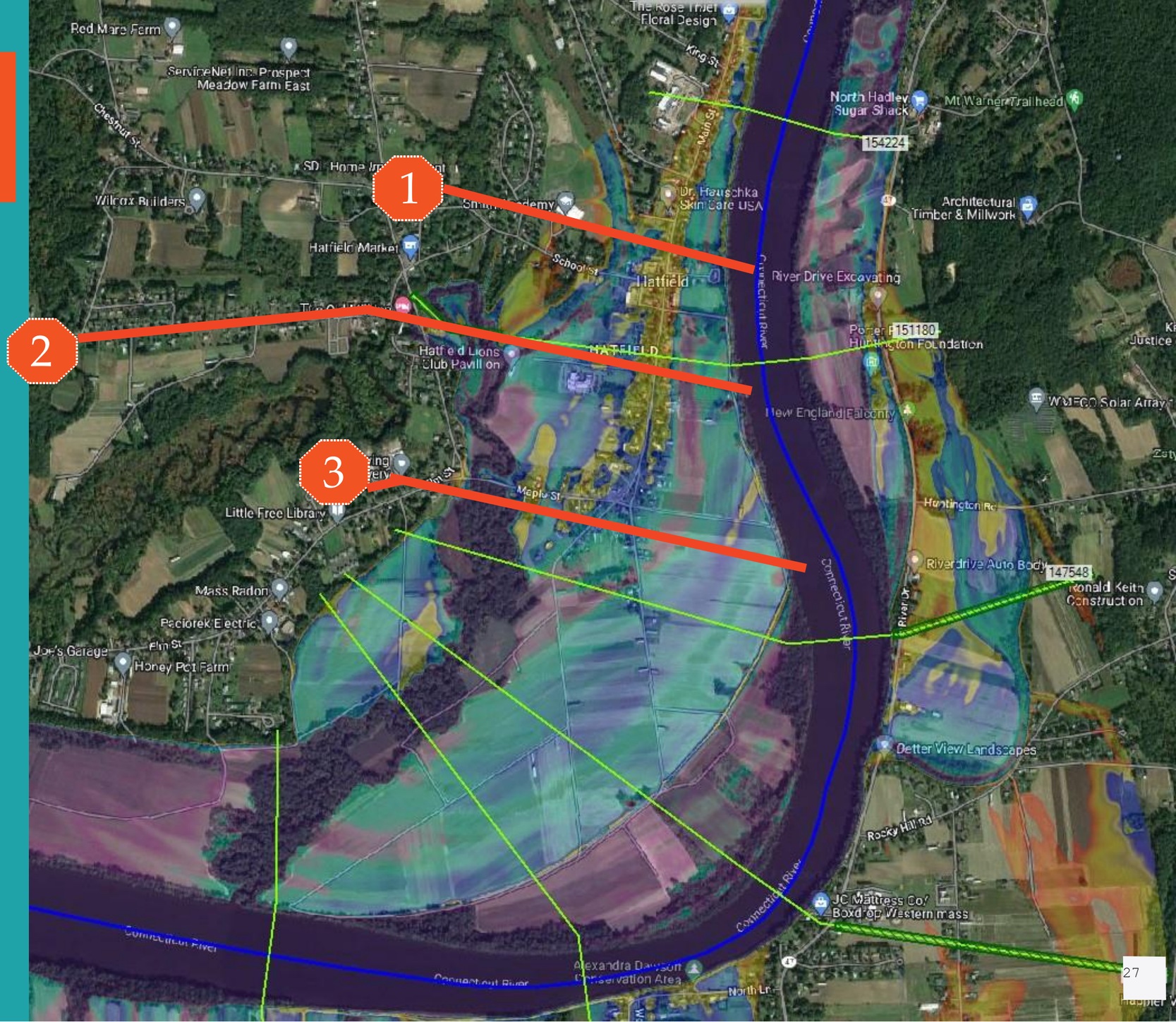
Evaluation of Flood Depths and Critical Infrastructure

Cross-sections for critical areas :

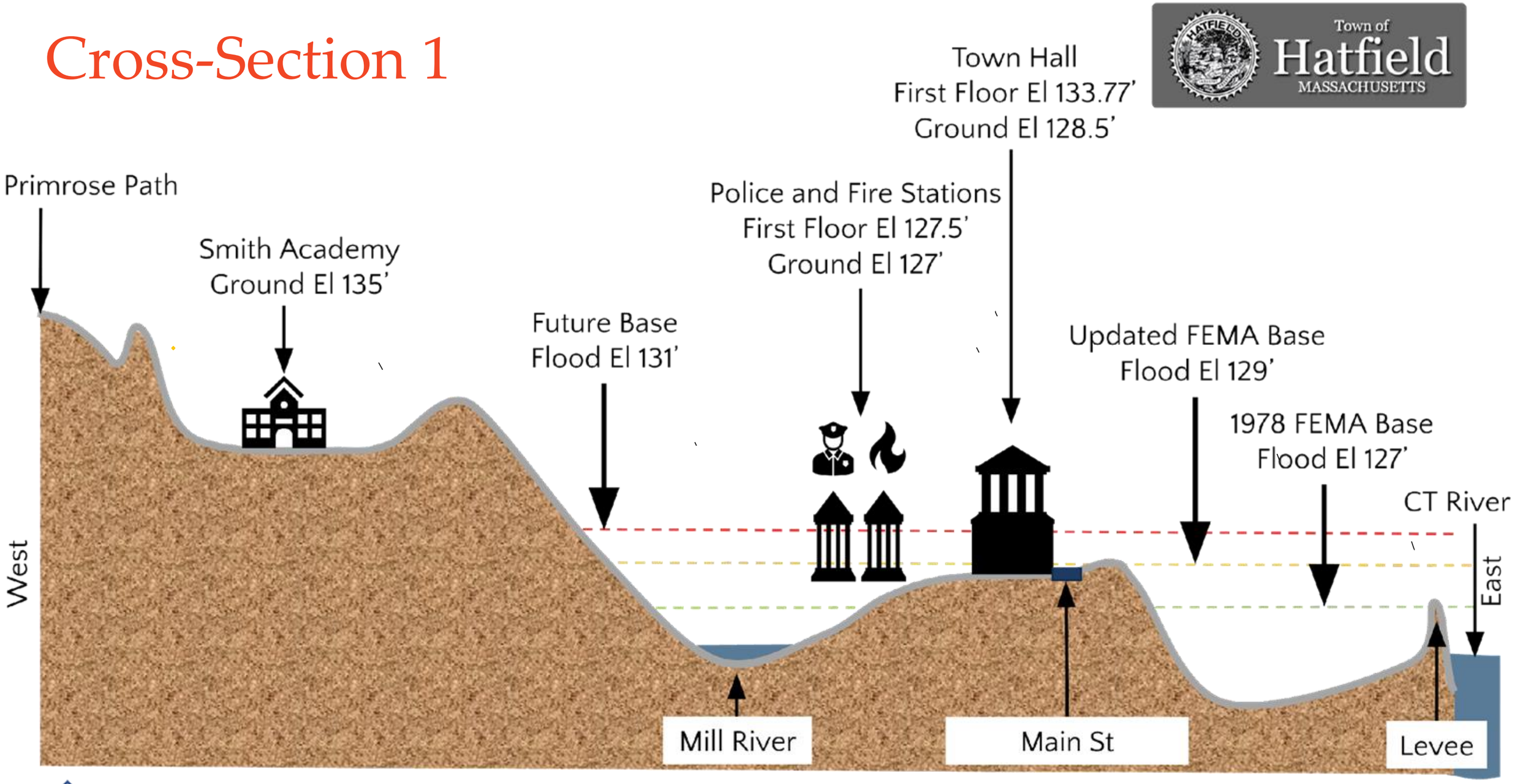
1. Chestnut St. to
   School St. to
   Town Hall/Main St. to
   Levee to CT River

2. Bridge St. to
   Elementary School to
   Main St. to
   Levee to CT River

3. Elm St. to
   Maple St. to
   Levee to CT River



Cross-Section 1



Town Hall

First Floor=EL 133.8

Projected Climate Change EL 131

Updated FEMA BFE=EL 129

1978 FEMA BFE=EL 127

Fire Department

Projected Climate Change EL 131

Updated FEMA BFE=EL 129

First Floor=EL 127.5

1978 FEMA BFE=EL 127

Protect & maintain your levee

It may not protect you from the 1% event, but it will have some protection from the lesser more frequent ones.

Maintain the Protection You Have

Implement Various Strategies for Critical Facilities & Infrastructure

Protect with...

Barriers

Redirect water from entering the Facility

Wetproofing

Allow water to flow through the Facility

Dryproofing

Block water from entering buildings

Elevation Changes

Raising the elevation of the Facility higher than flood depths

Relocation

Relocate the building outside the floodplain

Protect with Barriers

Redirect water from entering the Facility

Protect with Wetproofing

Allow water to flow through the Facility

Protect with Dryproofing

Block water from entering buildings

Flood Shield

Protect with Elevation Changes

Raising the elevation of the Facility higher than the flood depths

Filling

Protect with Relocation

Relocate the building outside of the floodplain

Photo by Yves Cedric Schulze on Unsplash