

# Lamoille River Modeling and Alternatives Analysis

Hardwick Flood Mitigation

SLRCONSULTING.COM

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Selectboard

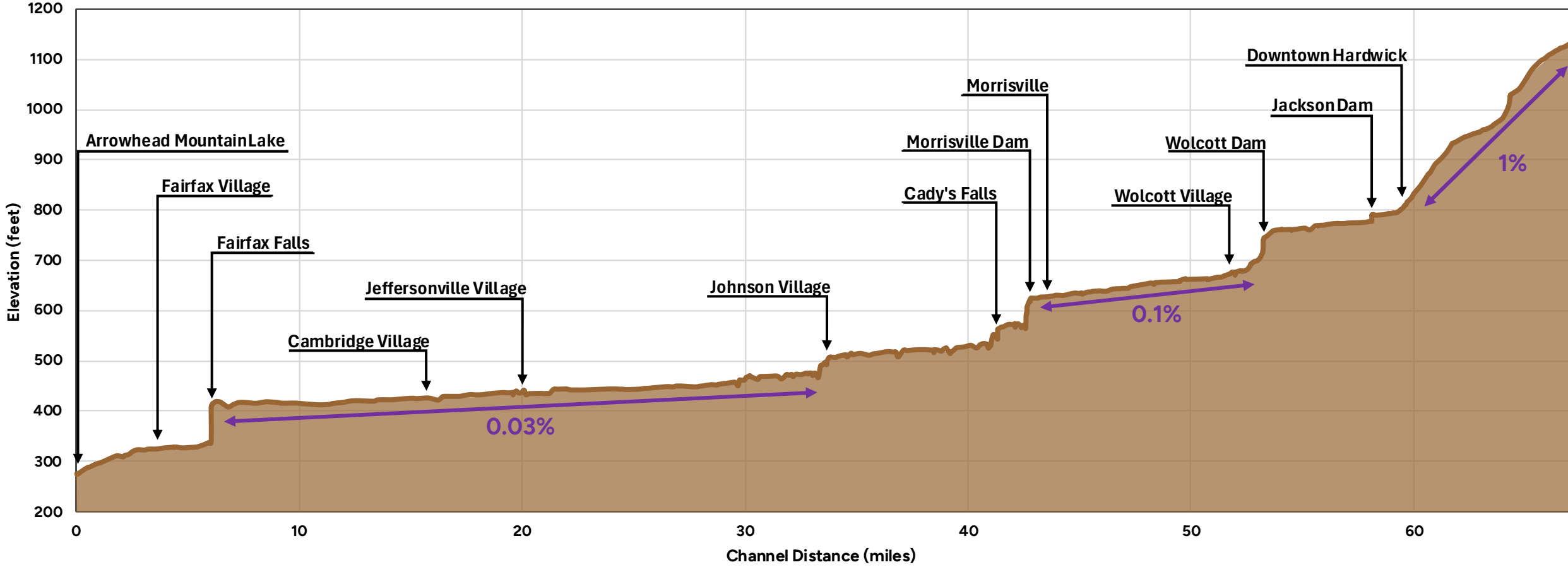








# Lamoille River Long Profile

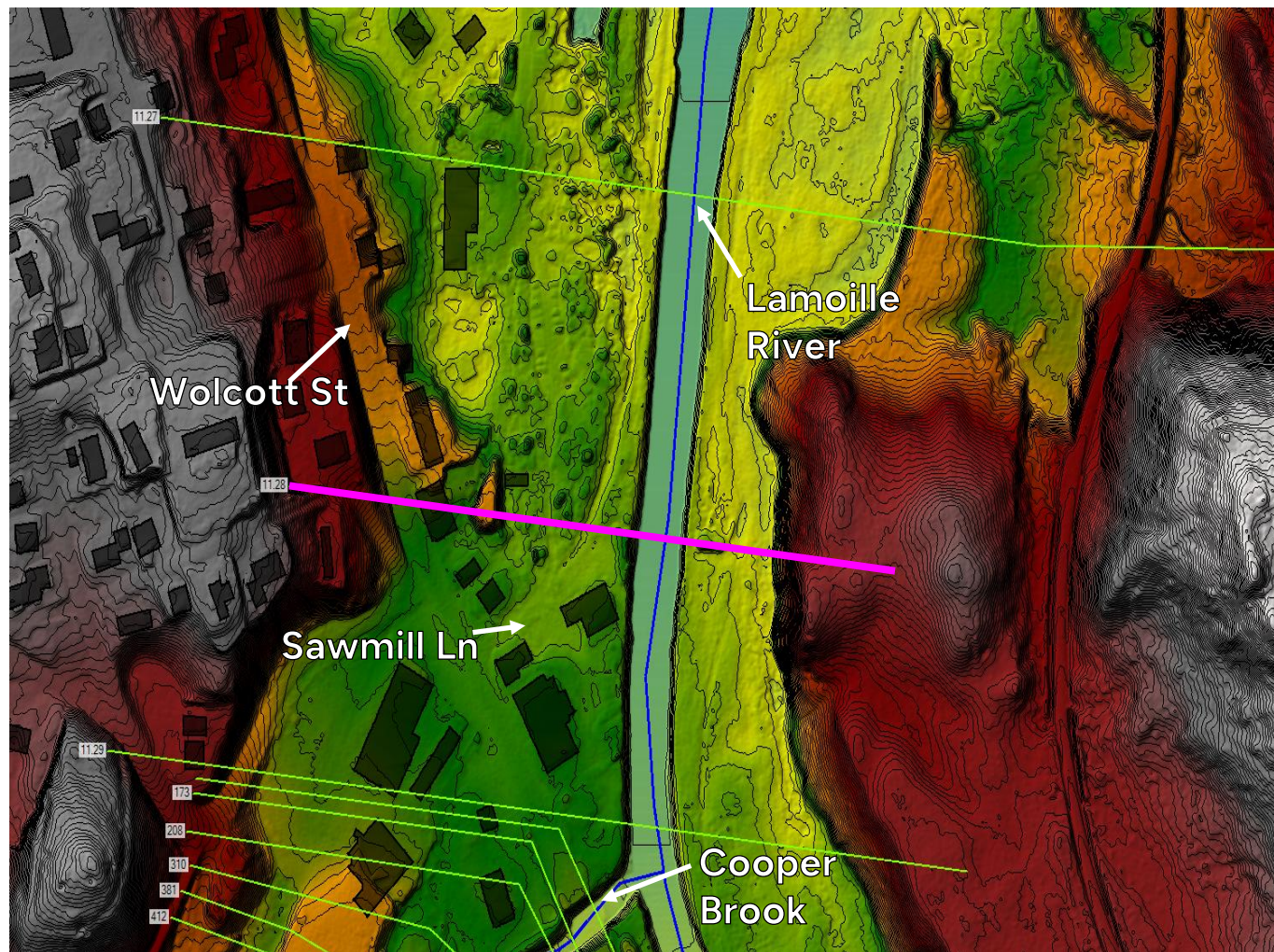






# Model Creation & Inputs

- Elevation Data
  - LiDAR – 2023
  - Survey
  - UAV
  - FEMA prior points (below water)
- Landuse for Roughness
- Buildings
- Bridge, Culvert, and Dam Plans
- Field Observations and Measurements

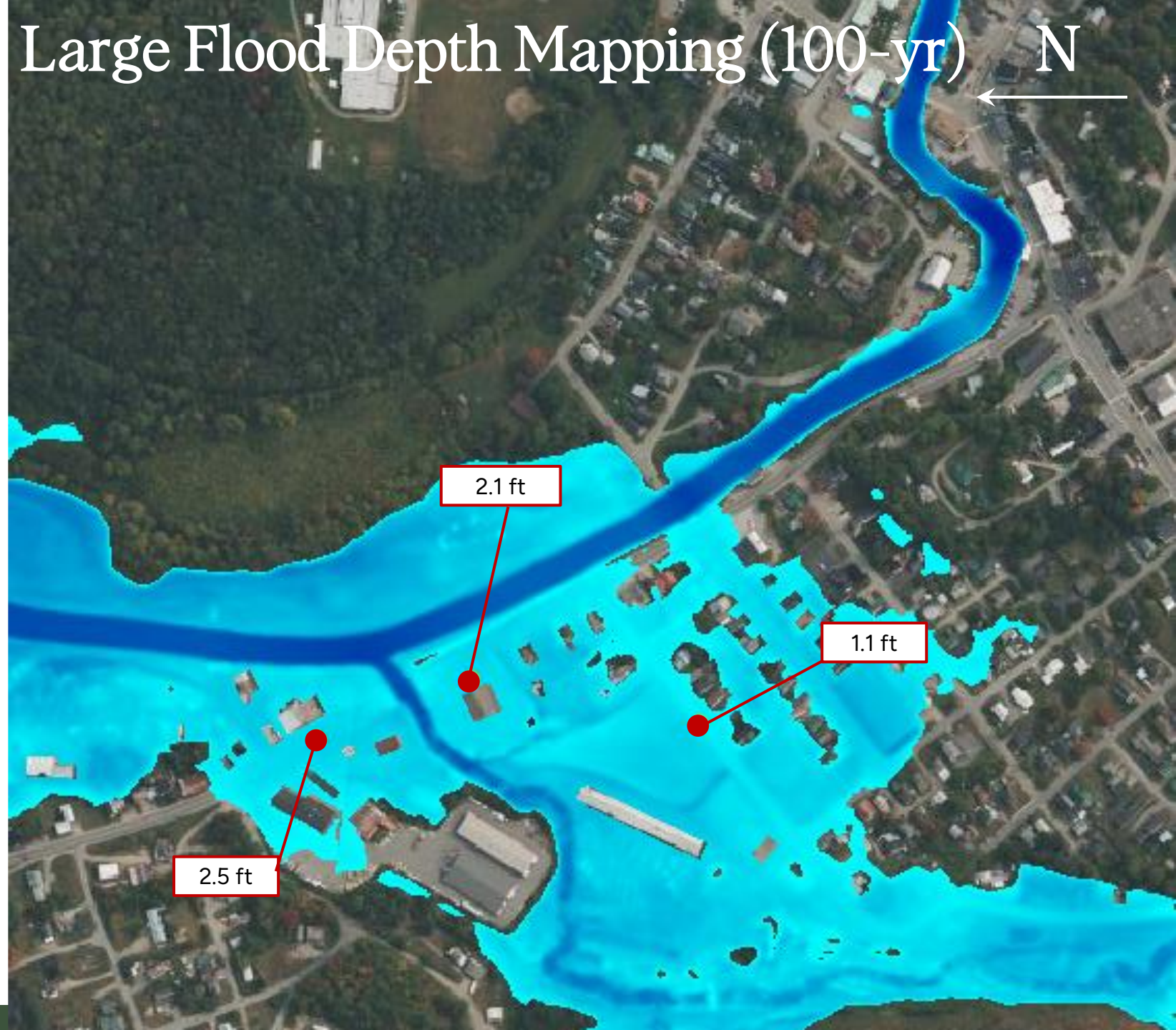




# Model Output

- Water Surface Elevation
- Floodplain Mapping
- **Flow Characteristics**
  - Velocity
  - **Depth**
- Channel and Water profiles
- Dam, Bridge, and Culvert Impacts
  - Backwatering
  - Overtopping
  - Scour

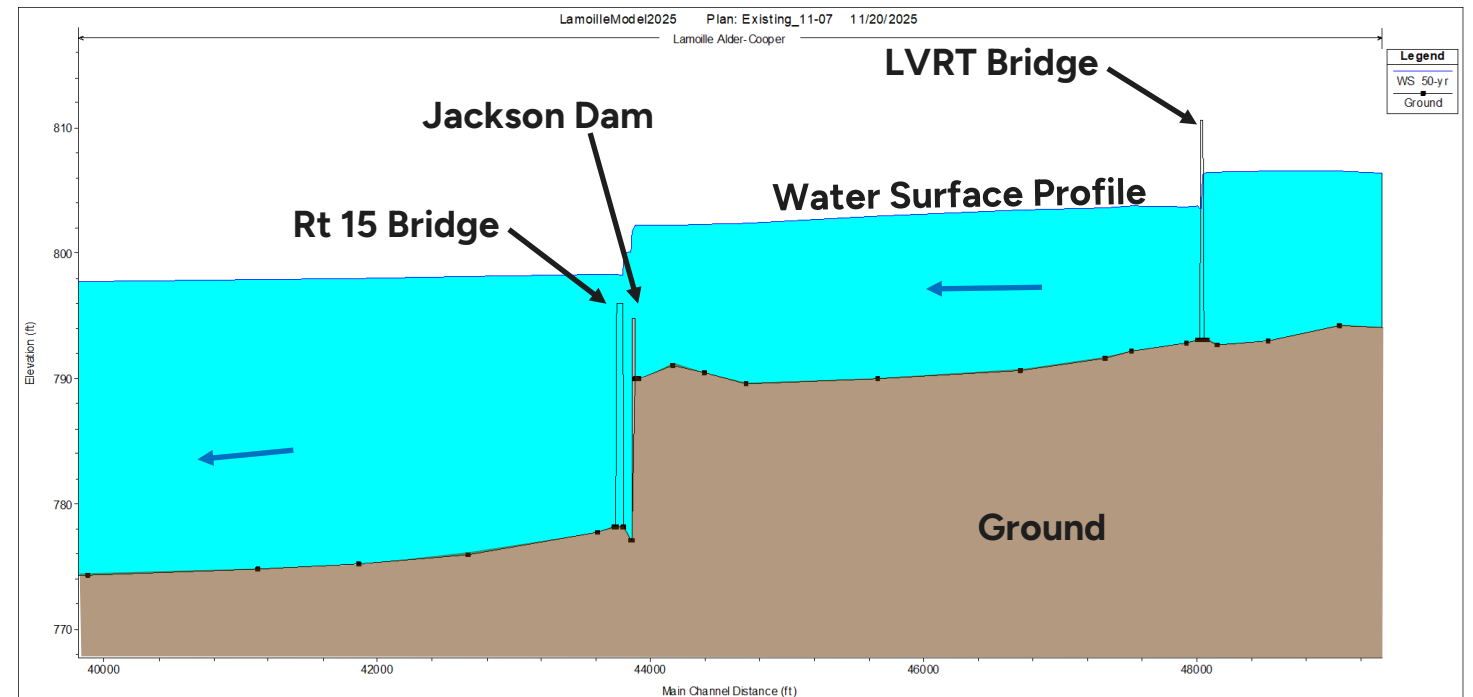
## Large Flood Depth Mapping (100-yr) ← N



# What can the model tell us?



- Water Surface Elevation
- Floodplain Mapping
- Flow Characteristics
  - Velocity
  - Depth
- **Channel and Water profiles**
- Dam, Bridge, and Culvert Impacts
  - Backwatering
  - Overtopping
  - Scour





# How Accurate is it?

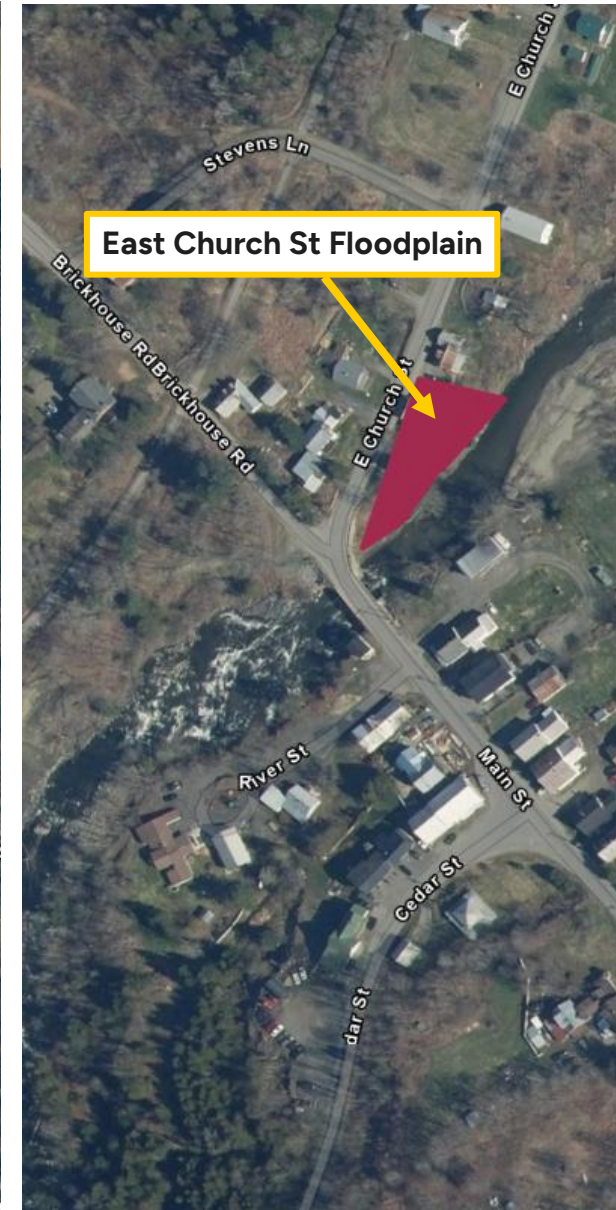
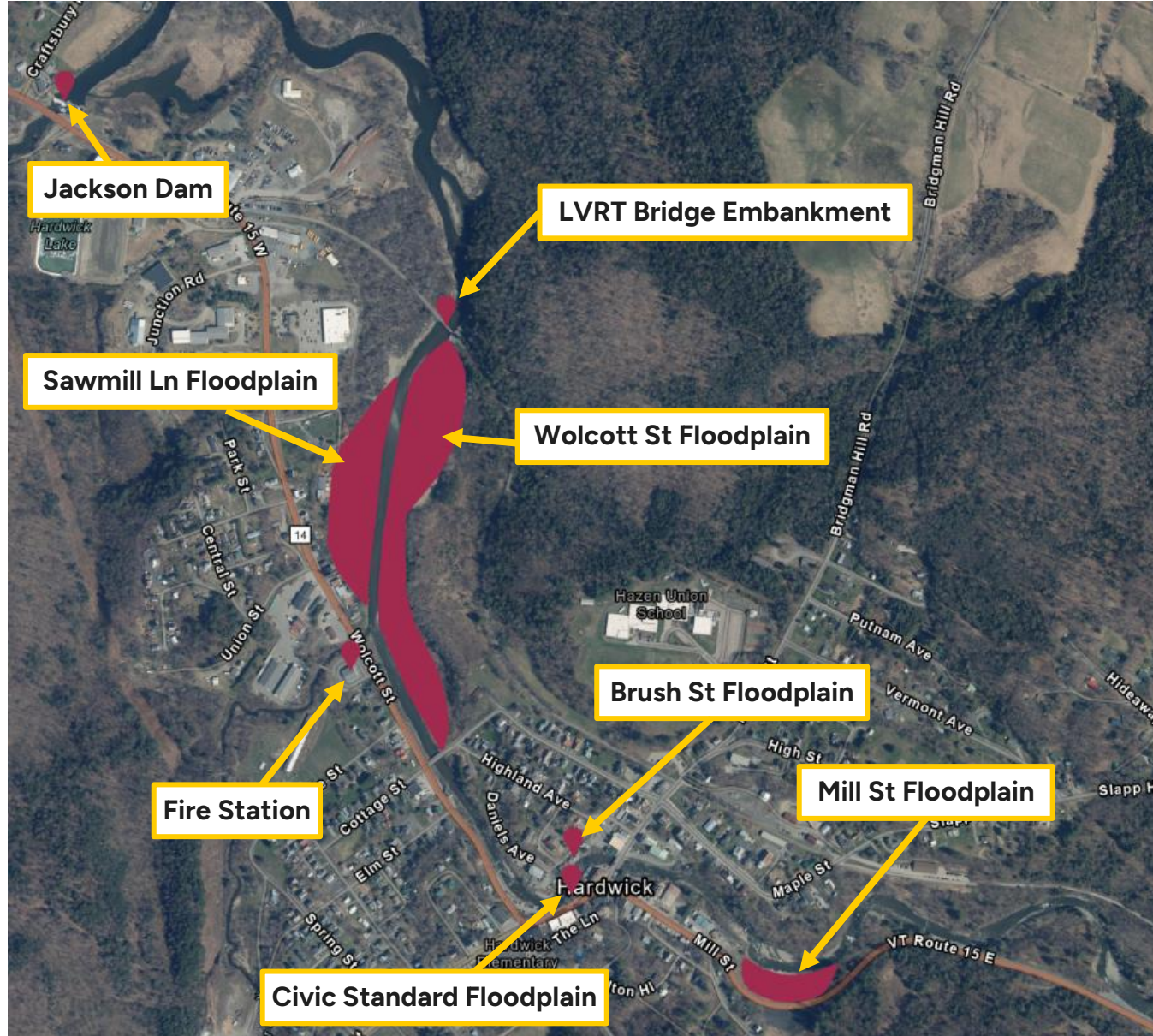


## Calibration / Validation:

- High Water Marks (HWMs)
- Accuracy is within 1 ft
- Good for comparing alternatives



# Potential Flood Mitigation Alternatives in Hardwick





# Mill Street Floodplain



## Problems

- Eroding bank
- Buyout

## Possible Solutions

- Slope stabilization/bank armoring
- Floodplain restoration
  - Space for Debris and Ice Shedding







# Proposed 100-yr Depth Mapping

Note: Velocities decrease 1.0 – 5.0 ft/s  
through project area



# Wolcott Street and Sawmill Lane Floodplains



## Problems

- Sediment deposition
- Inundation flooding
- Possible buyouts

## Possible Solutions

- Floodplain restoration opportunity





# LVRT Embankment

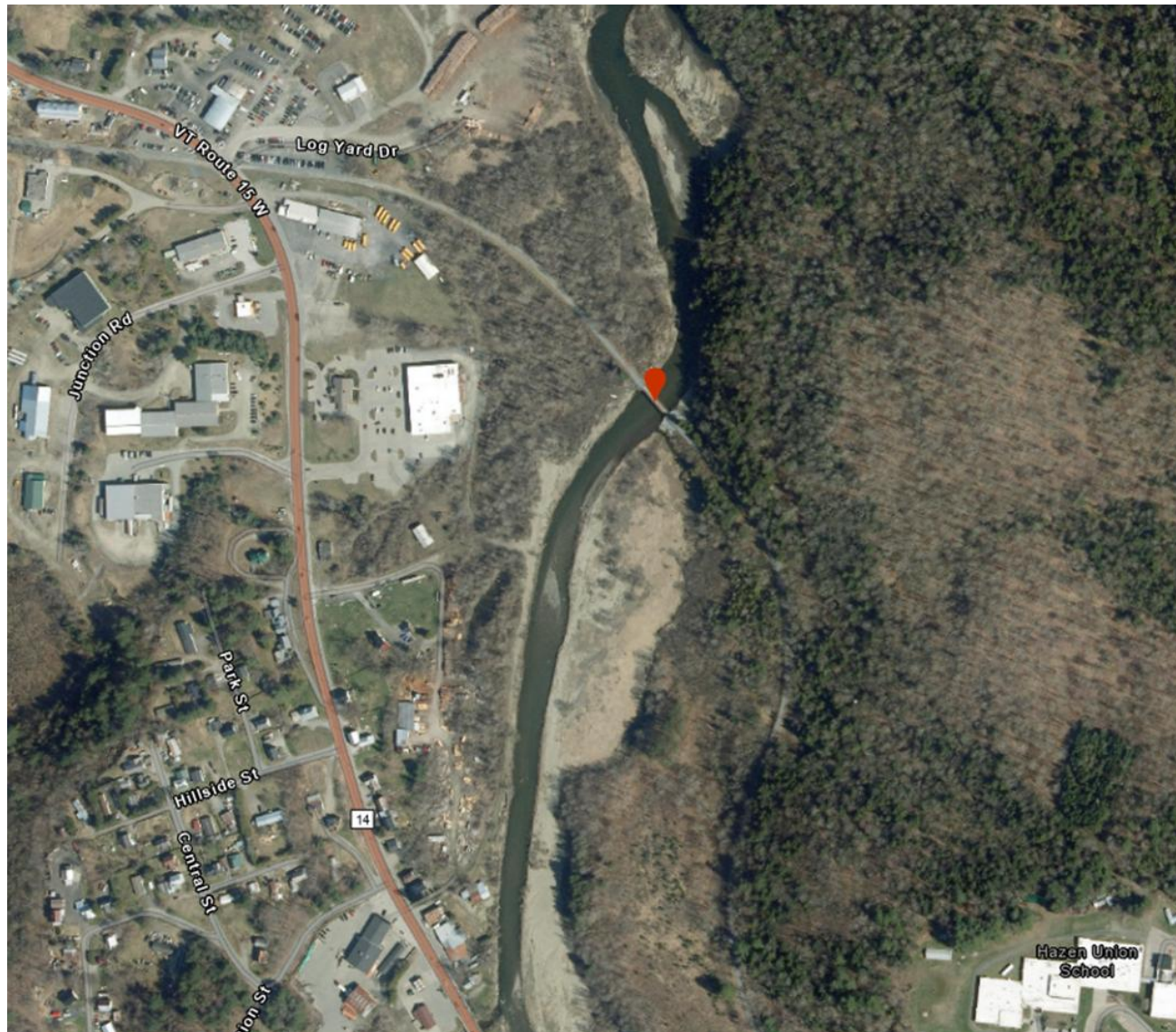


## Problems

- LVRT Bridge is a constriction and backs up flow
- Embankment fully blocks floodplain

## Possible Solutions

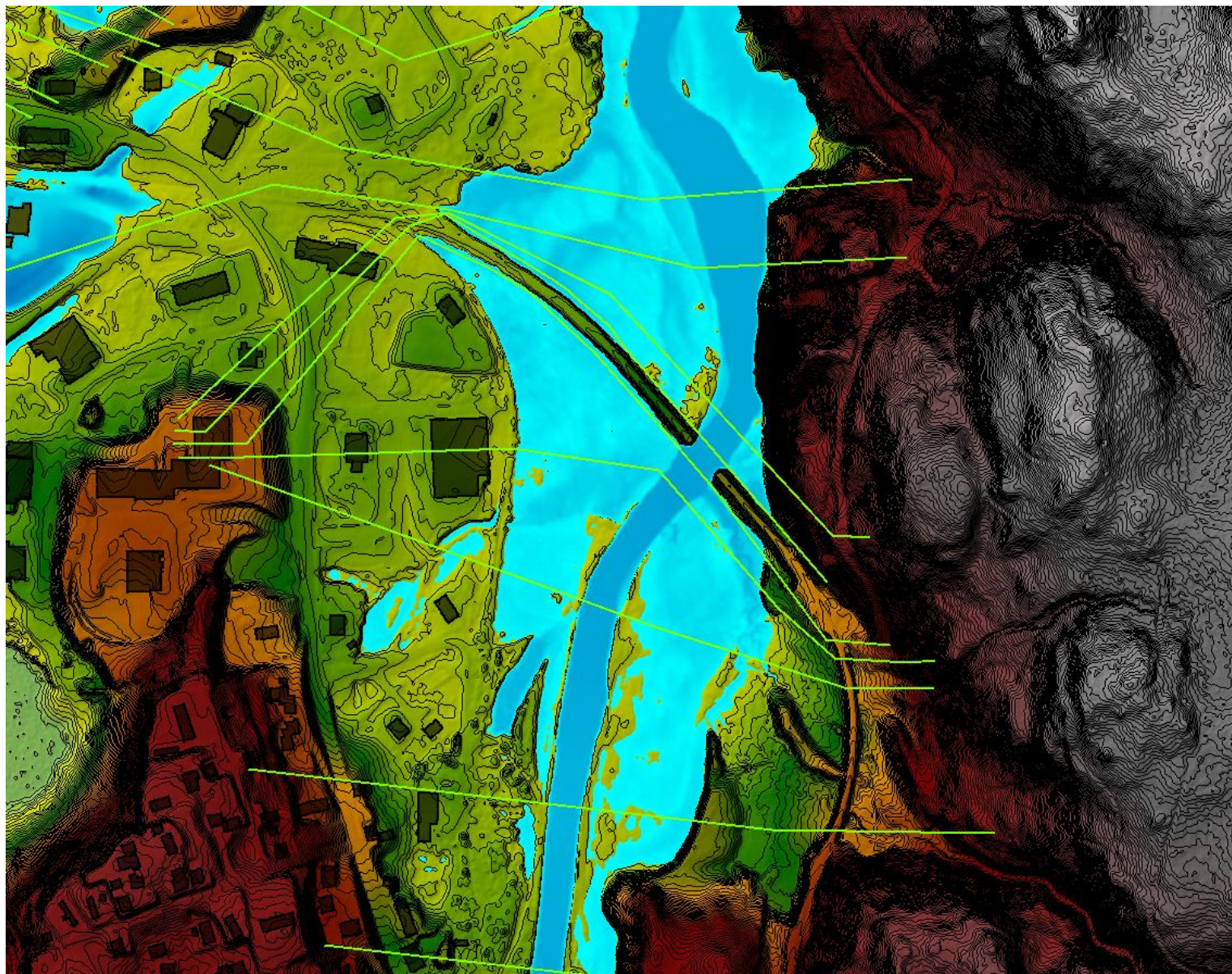
- Lower Embankment / Planned Overflow
- Widen Bridge







# Small Flood (2-yr)



Model Cross Sections



Terrain (2-ft contour)



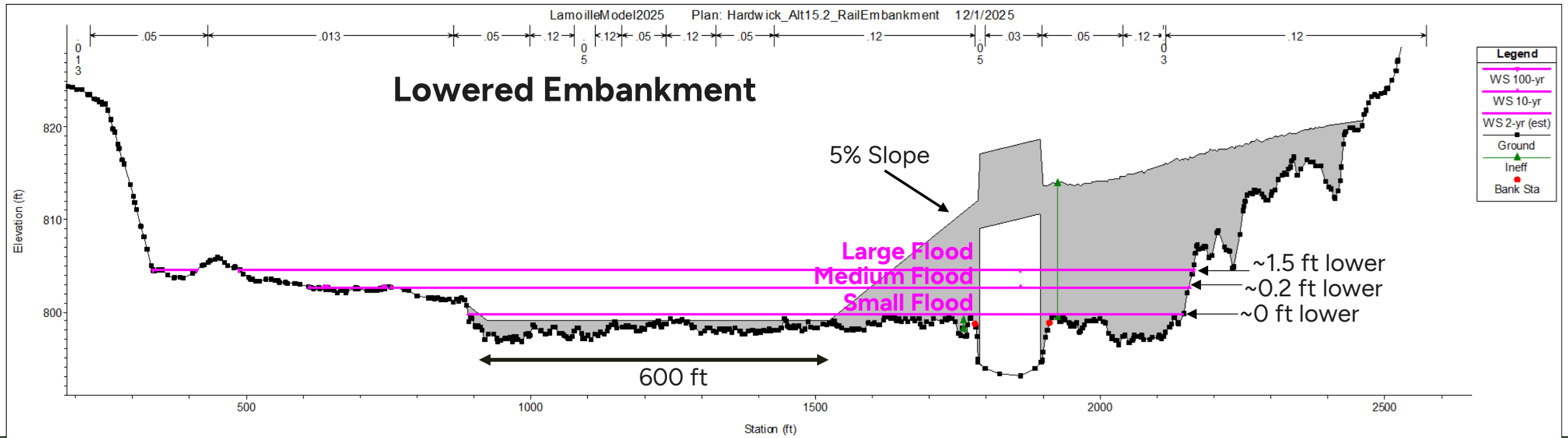
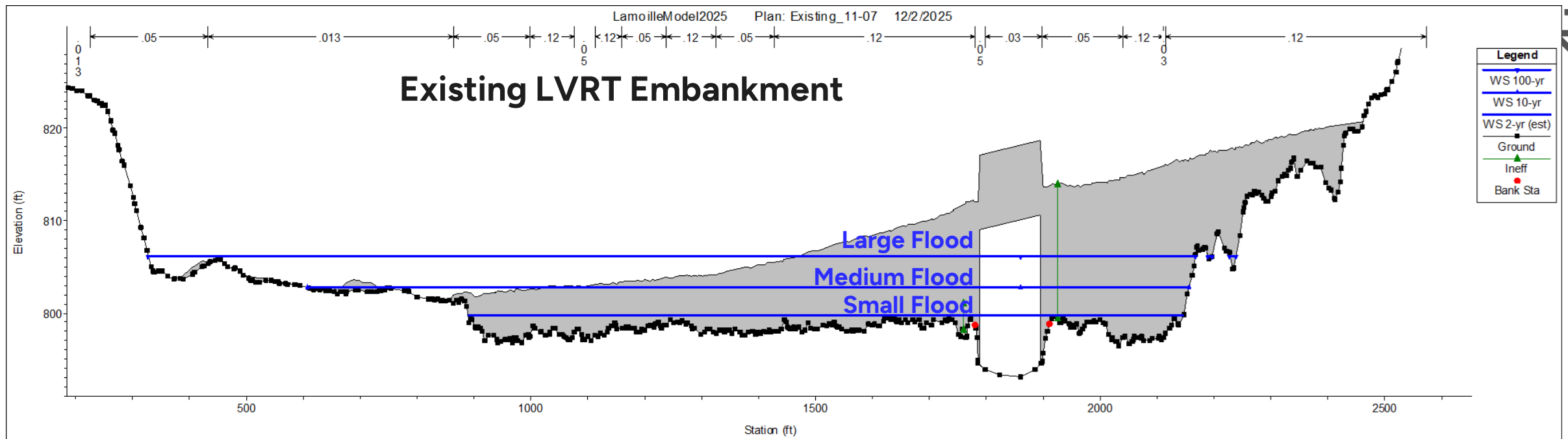
Buildings



Water Depth









# Jackson Dam

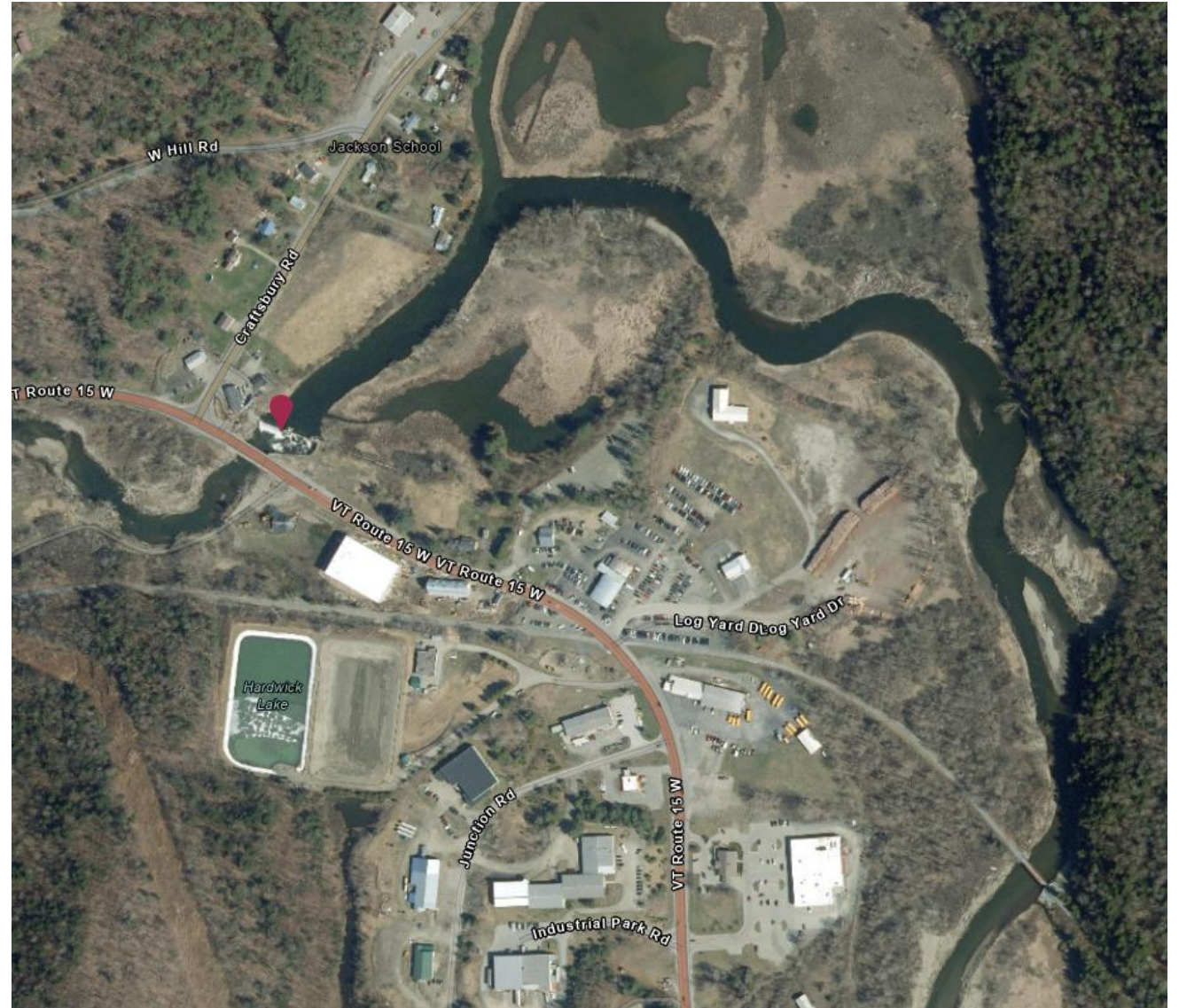


## Problems

- Barrier in River

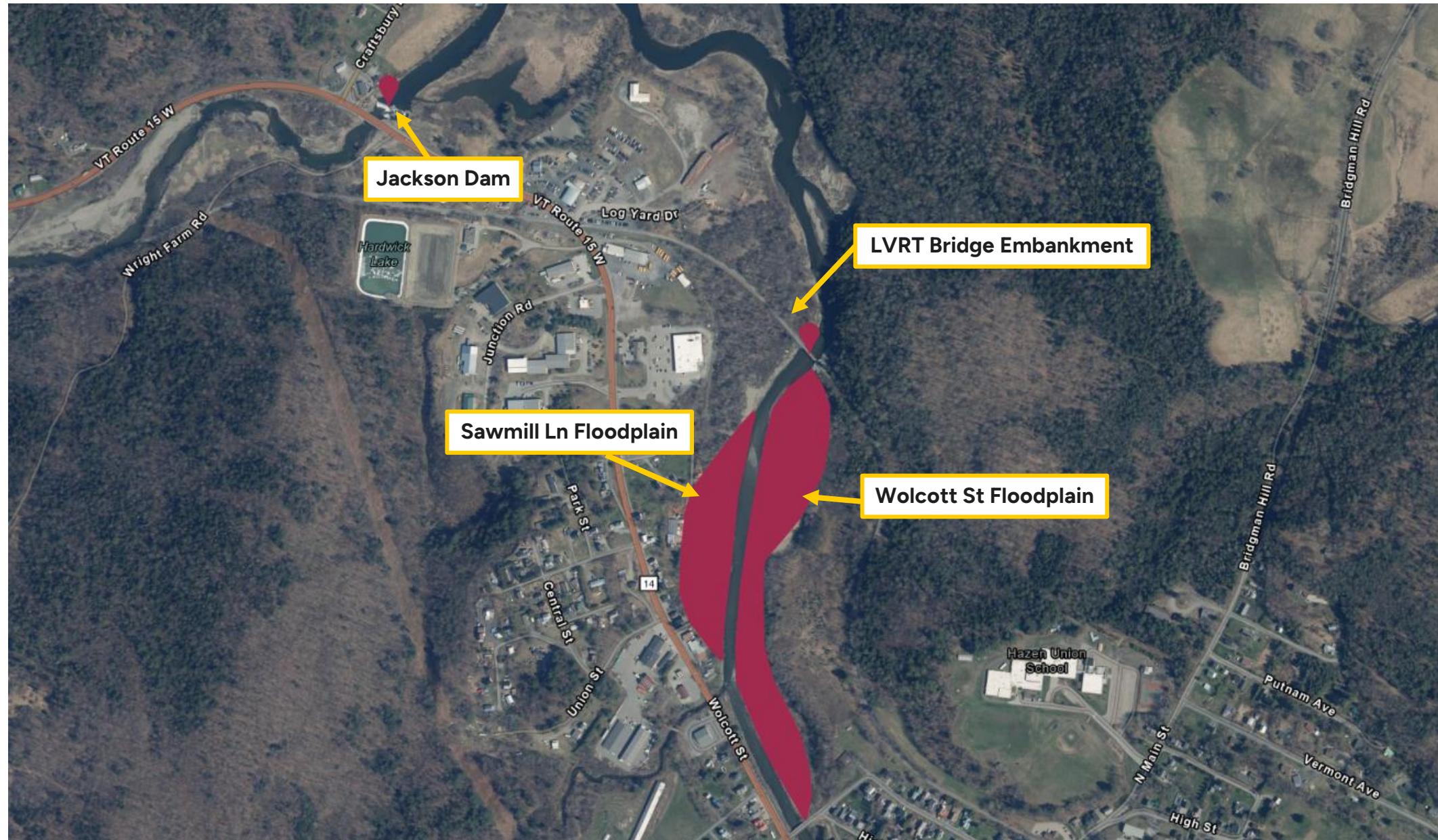
## Possible Solutions

- Dam removal
- Permanent drawdown



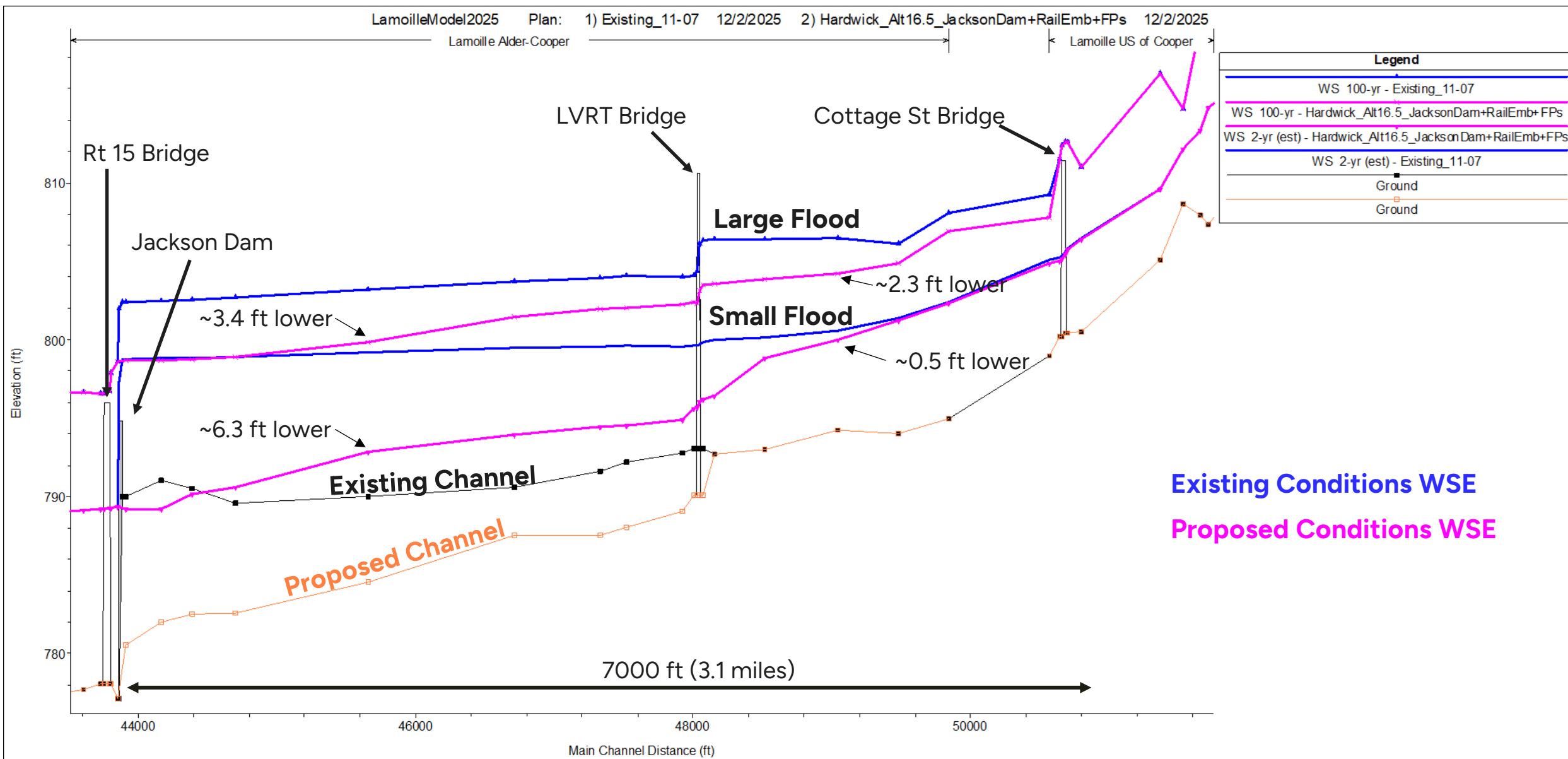


# Combined Flood Mitigation Alternatives

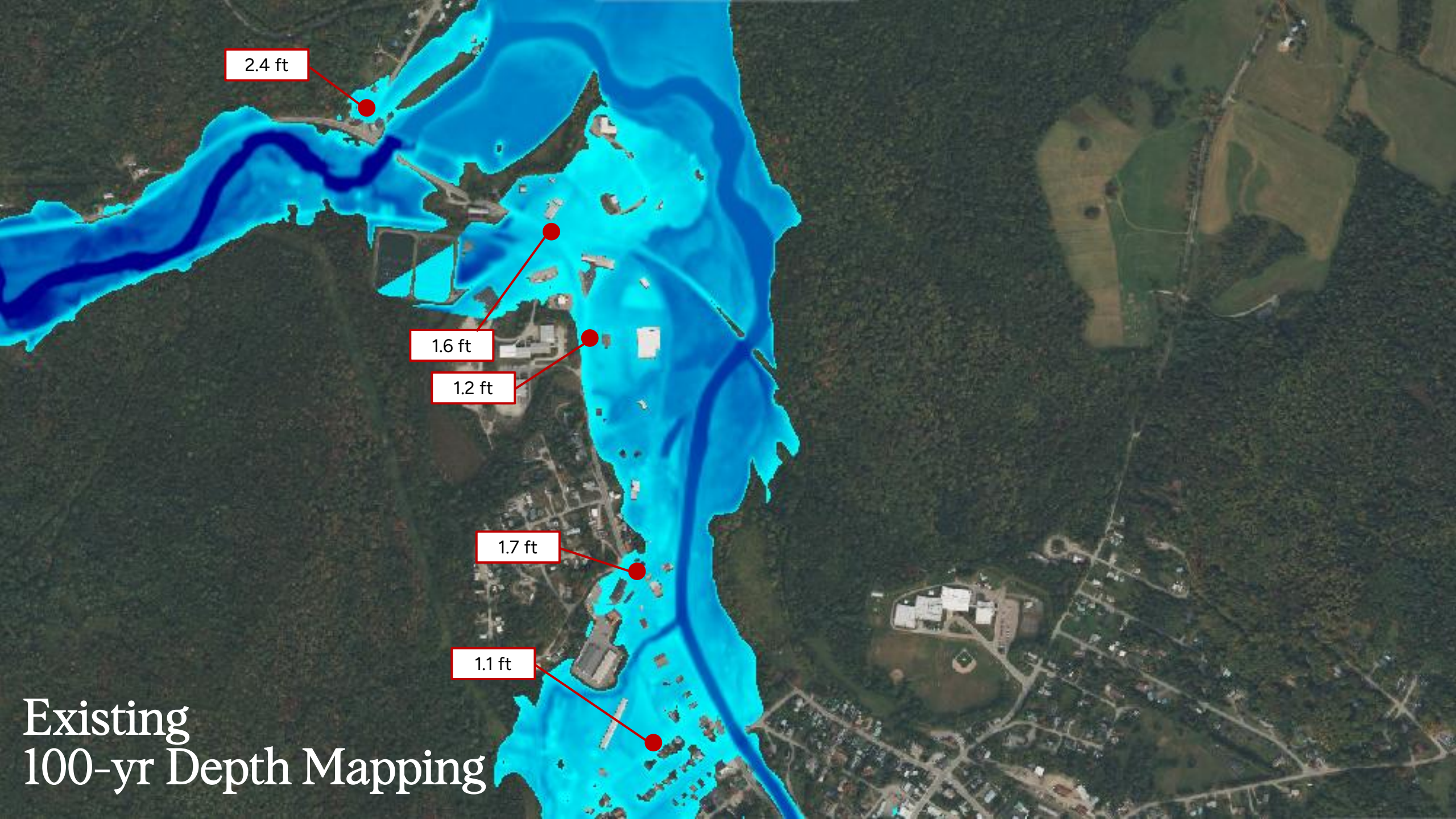




# Results – Lamoille River Profile







2.4 ft

1.6 ft

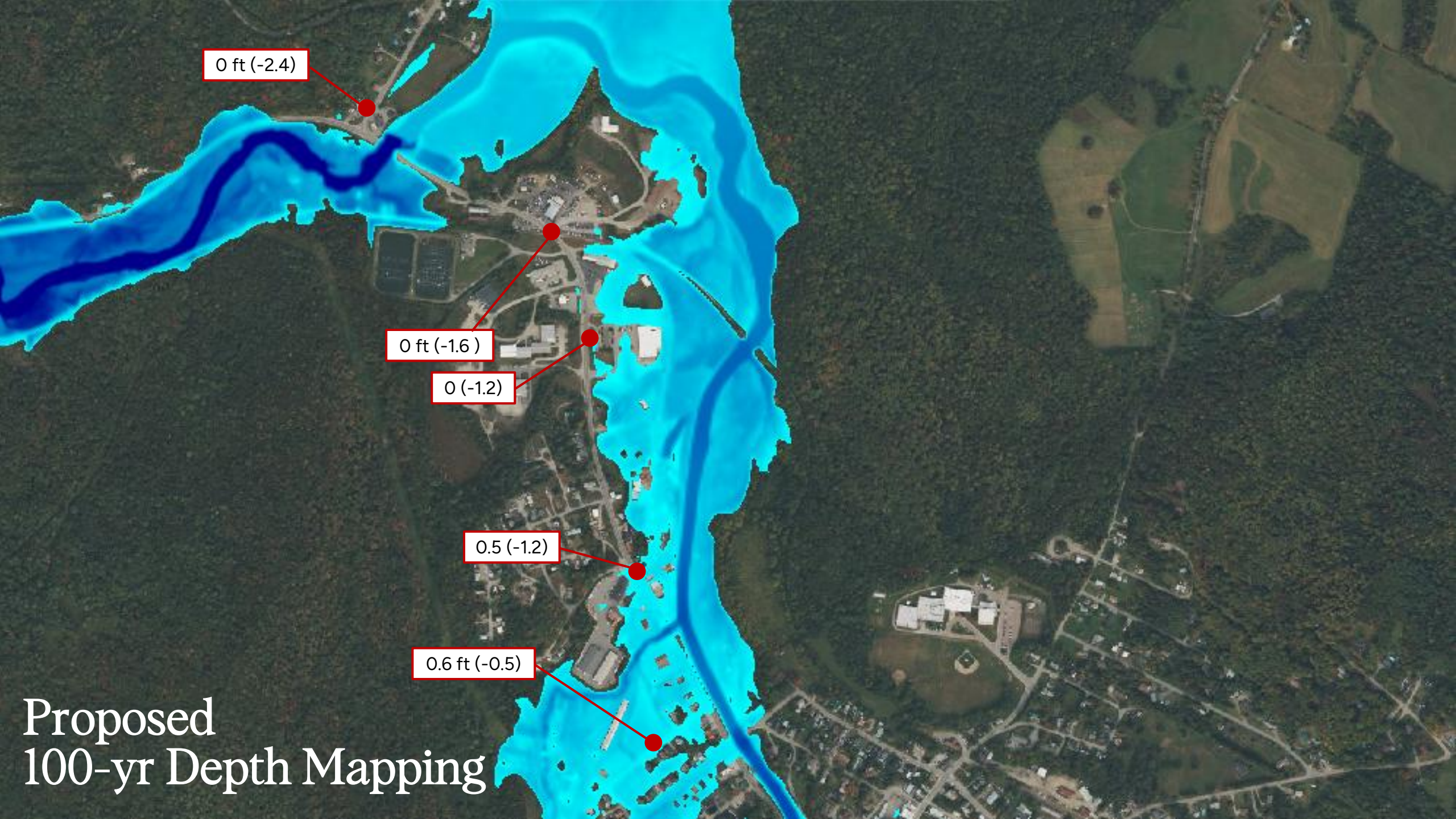
1.2 ft

1.7 ft

1.1 ft

Existing  
100-yr Depth Mapping





0 ft (-2.4)

0 ft (-1.6)

0 (-1.2)

0.5 (-1.2)

0.6 ft (-0.5)

Proposed  
100-yr Depth Mapping



# Questions? Next Steps:

- Full Presentation at HCTV
- Ongoing work with separate but parallel grants:
- Town – Granite Street Neighborhood
- Caledonia County NRCD – Jackson Dam
- More meetings this winter