Flood Resilient Land Use

- What we do now
- Why this is inadequate
- What can we do better?

SOUTHERN TIER CENTRAL
REGIONAL PLANNING & DEVELOPMENT BOARD

James McKinley, CFM, Planner
Janet Thigpen, CFM

October 27, 2026

Floods Happen



Jasper, August 2021
(Source: D. Shea)



Woodhull, August 2024
(Source: A. Helen)



August 2018 (Source: Mecklenburg Fire Department)



Jasper, August 2024
(Source: D. R. Monson)

Floods Happen



Steuben County, August 2021
(Source: M. Tombs)



Town of Bath (Source: Steuben County Emergency Management Office)



Jasper, August 2024
(Source: J. Conrad, Sr.)

Public Safety Announcement



September 2004
(Source: STCRPDB)

FLOODING? BE SAFE!

Turn Around Don't Drown

Are We Managing Flood Risk EFFECTIVELY?

Manage water

- Levees
- Dams
- Stream maintenance & restoration
- Roadside drainage improvements
- Right sizing bridges & culverts
- Stormwater management

Manage development

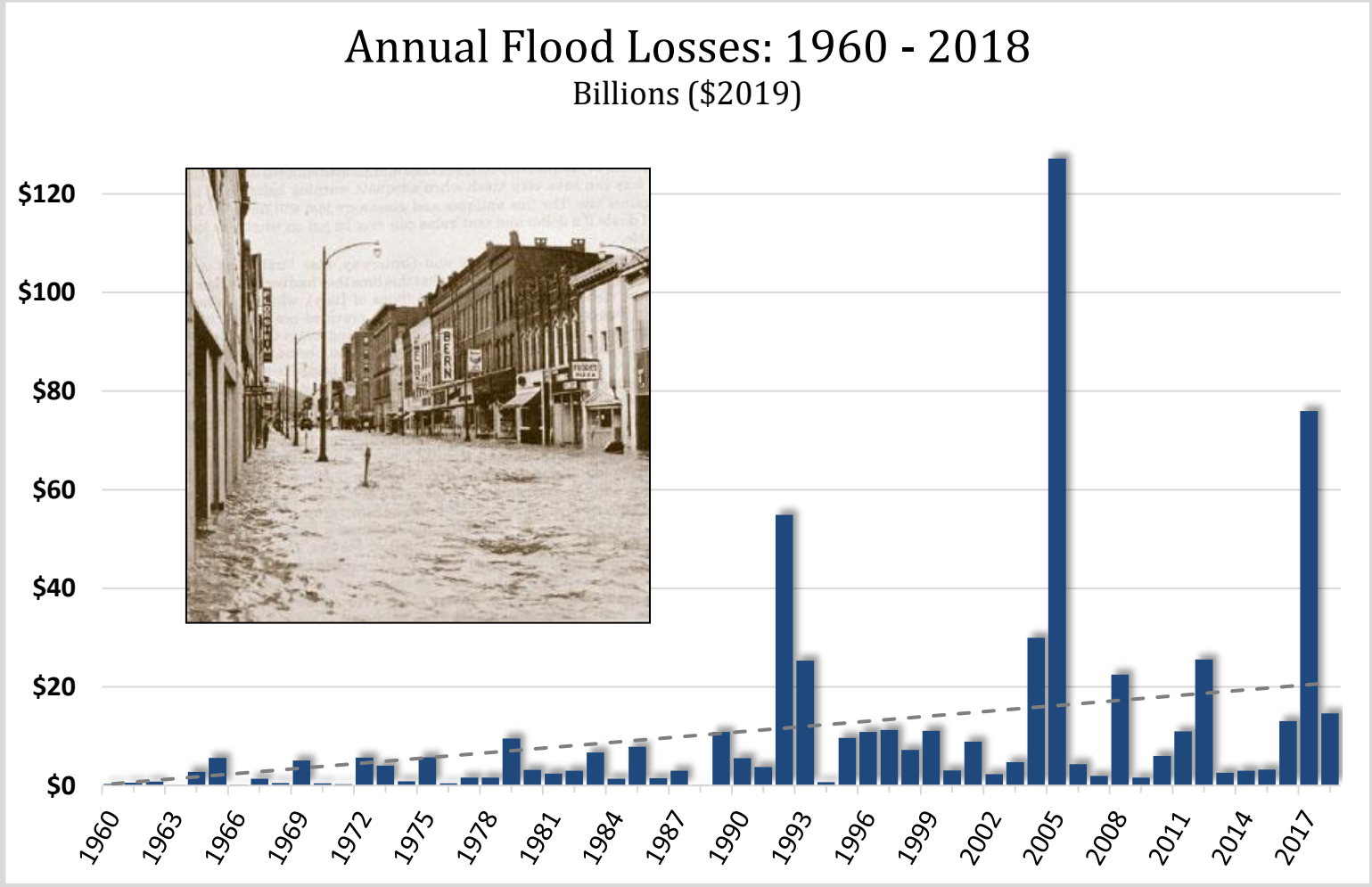
- Floodplain management
- Buyouts
- Building elevation

Manage emergencies

- Flood warnings
- Emergency response
- Flood recovery

National Perspective

- Since 1960, losses have averaged nearly $10 billion per year.
- Since the 60s, per person annual losses have increased by more than a factor of 6



CEMHS, 2019. Spatial Hazard Events and Losses Database for the United States, Version 18.1. [Online Database]. Phoenix, AZ: Center for Emergency Management and Homeland Security, Arizona State University.

**“Floods are acts of nature;
but flood losses
are largely acts of man.”**

Dr. Gilbert White

Agenda

- No Adverse Impact Floodplain Stewardship
- Paradigm for Flood Safe Land Use
  1. Assess flood hazards
  2. Identify areas of highest flood risk
  3. Identify beneficial natural features that provide flood protection
  4. “Make room for water” in areas of highest flood risk and beneficial natural areas
  5. “Live with floods” in flood hazard areas
  6. “Manage water where it falls” throughout the community

No Adverse Impact Floodplain Stewardship

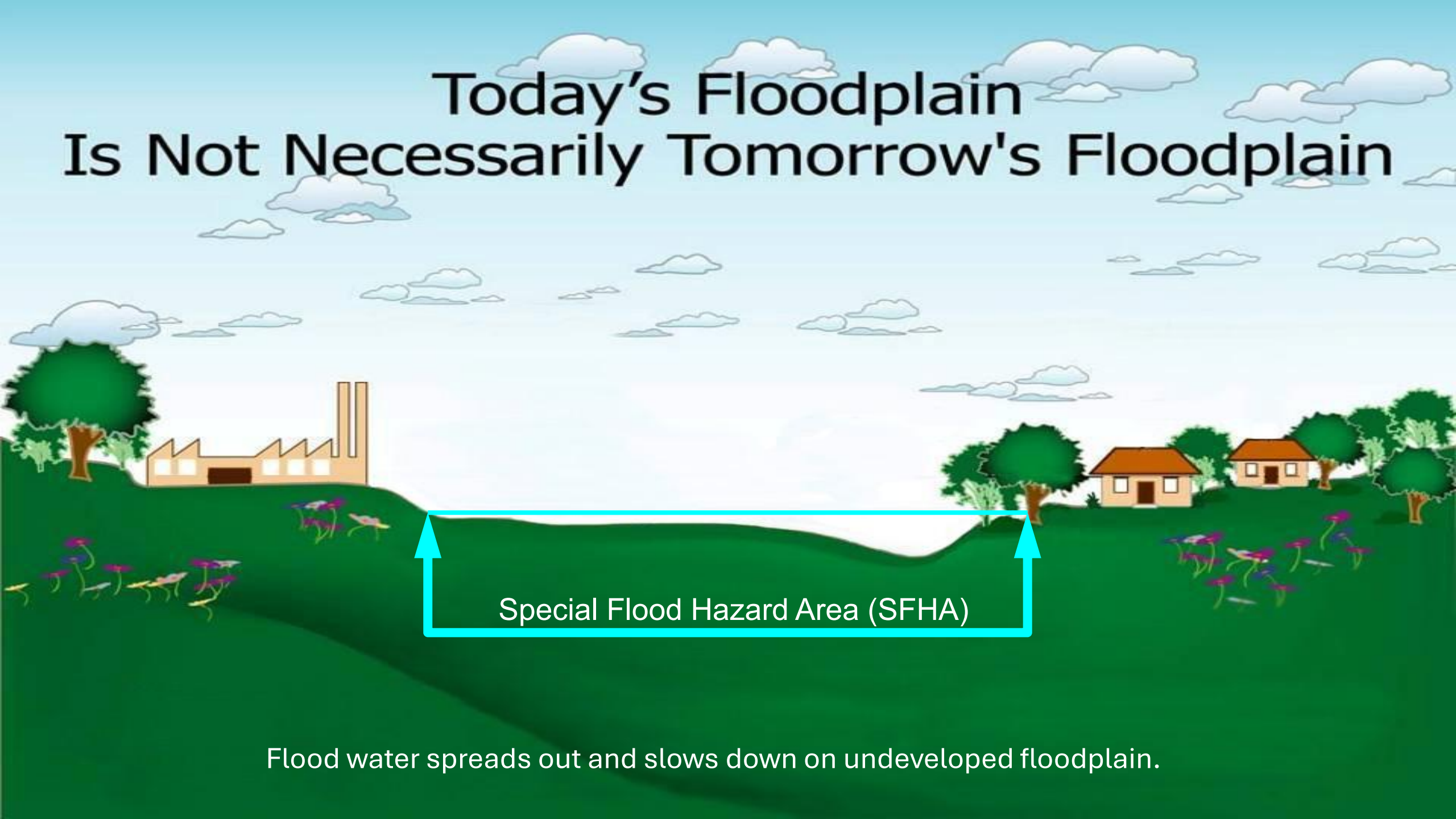
No Adverse Impact (NAI) is an approach that ensures that the action of any community or property owner, public or private, does not adversely impact the rights of others.

- ➡ Identify the impacts
- ➡ Mitigate the impacts



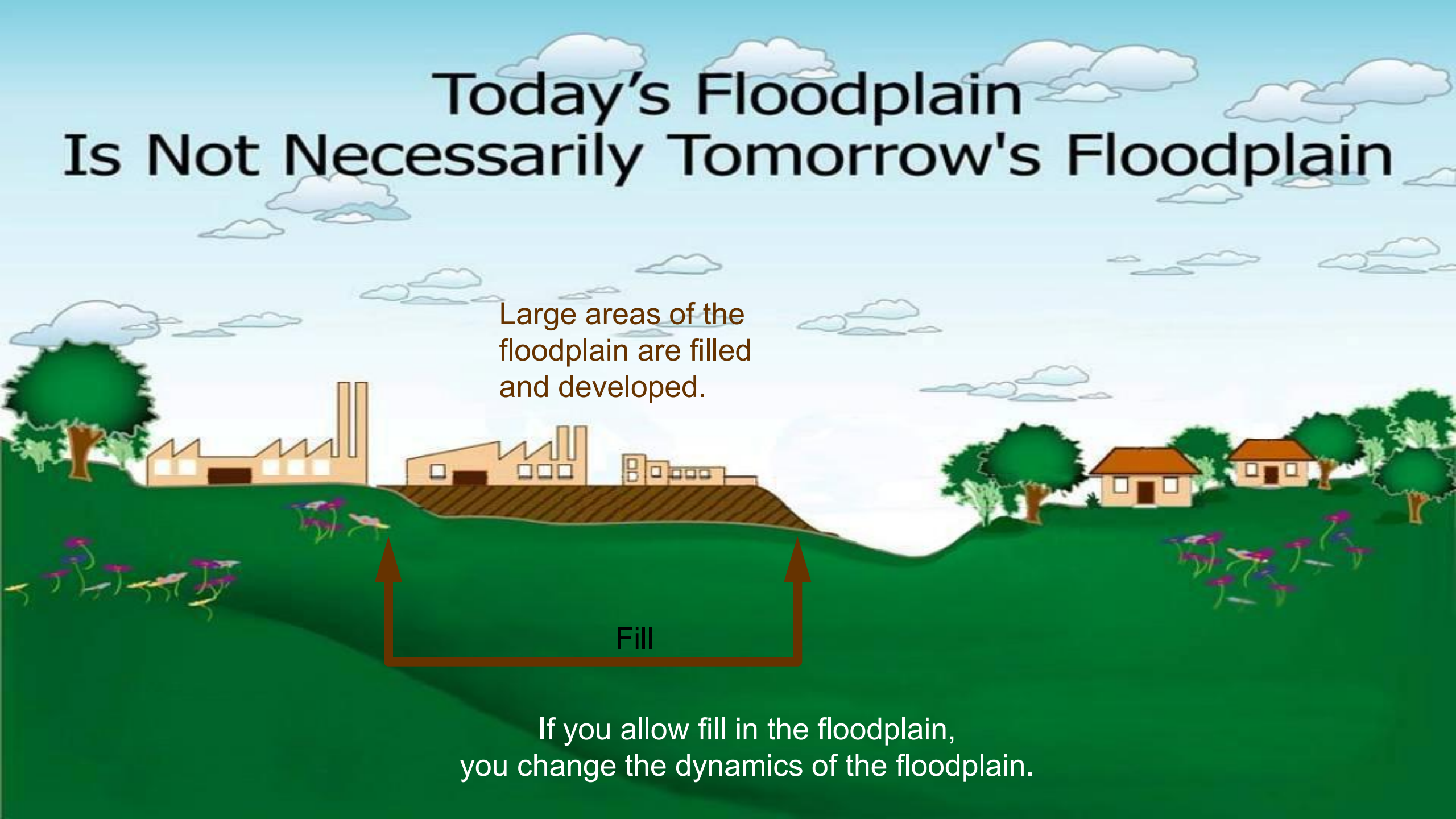


Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



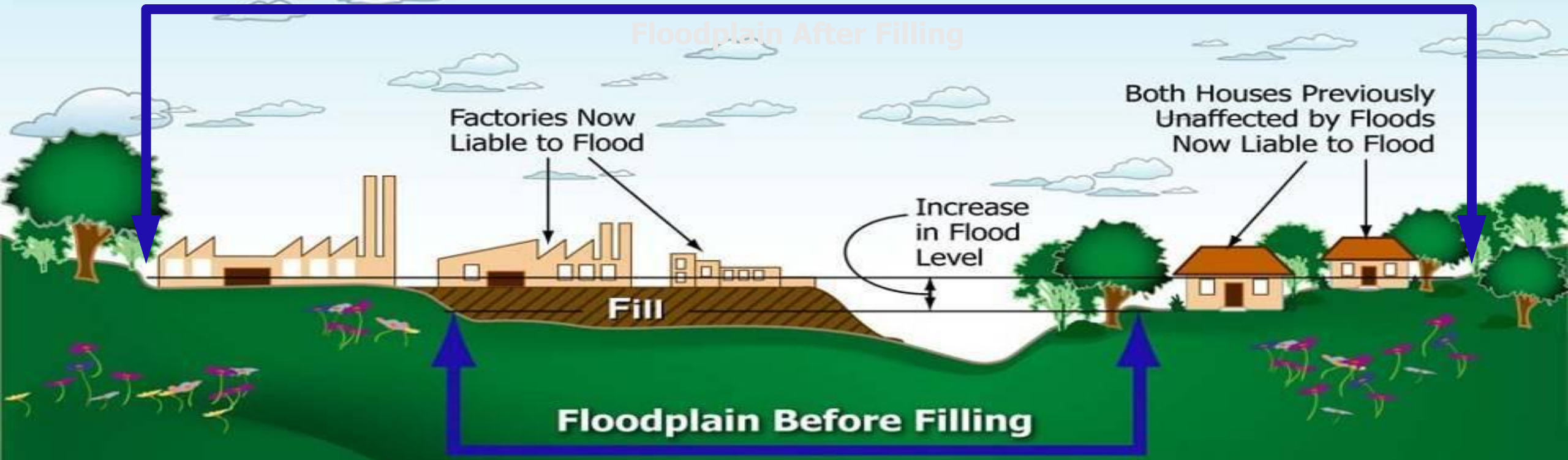
Flood water spreads out and slows down on undeveloped floodplain.

Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



If you allow fill in the floodplain,
you change the dynamics of the floodplain.

Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters. This means your home or business may be impacted.

NAI Is a Good Neighbor Policy



"Sic utere tuo ut alienum non laedas"

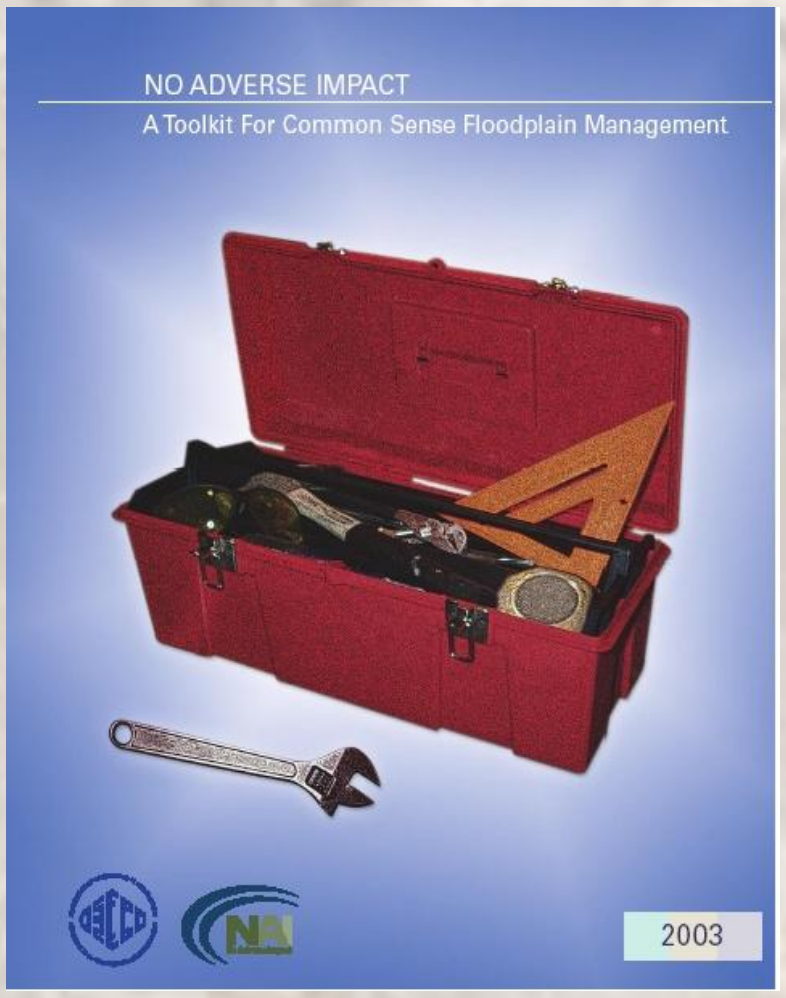
or

"So use your own property that you do not injure others"

- Ancient Justinian (Roman) law

Legal guidance is available in the “No Adverse Impact Legal Guide for Flood Risk Management” by ASFPM, 2023, https://floodsciencecenter.org/products/no-adverse-impact-legal-guide/

Implementing NAI



The No Adverse Impact Toolkit presents ideas for integrating NAI into local programs

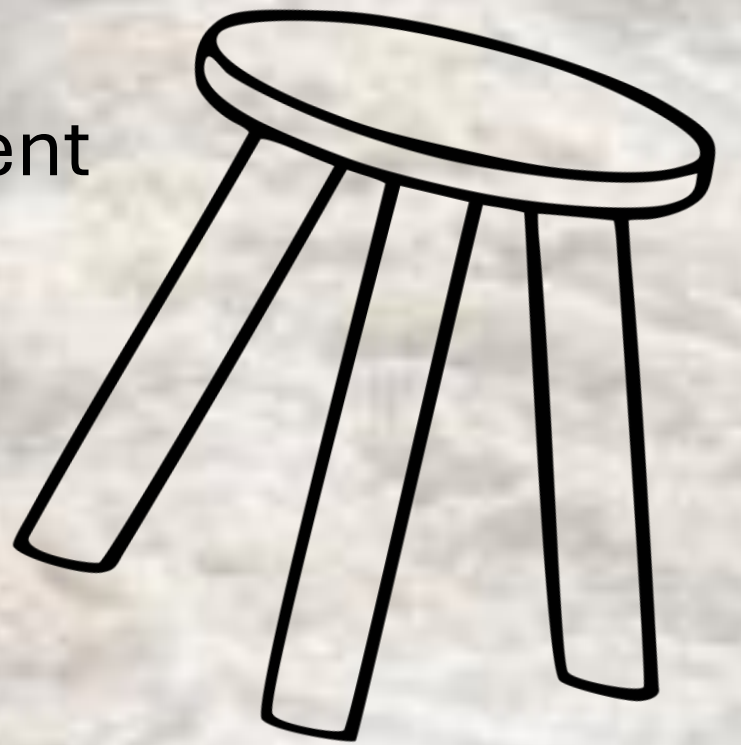
- Hazard Identification & Floodplain Mapping
- Planning
- Regulations & Development Standards
- Mitigation
- Infrastructure
- Emergency Services
- Education & Outreach

Valuable NAI resources are available at www.floods.org – click on the NAI logo.

Current Floodplain Management

National Flood Insurance Program (NFIP)

- Flood insurance
- Flood Insurance Rate Maps (FIRMs)
- Local regulation of floodplain development
  - Local Law for Flood Damage Prevention
  - NYS Uniform Code



Limitations

National Flood Insurance Program (NFIP)

- Not all flood hazard areas are mapped
- Few restricted areas
  - Floodways
- No requirement to protect natural floodplain functions
- No limits on siting of critical facilities
- Fill in floodplain is allowed

Paradigm for Flood Safe Land Use



Big Flats, August 2021
(Source: R. Sweet)



Canisteo, August 2024
(Source: N. Simon)



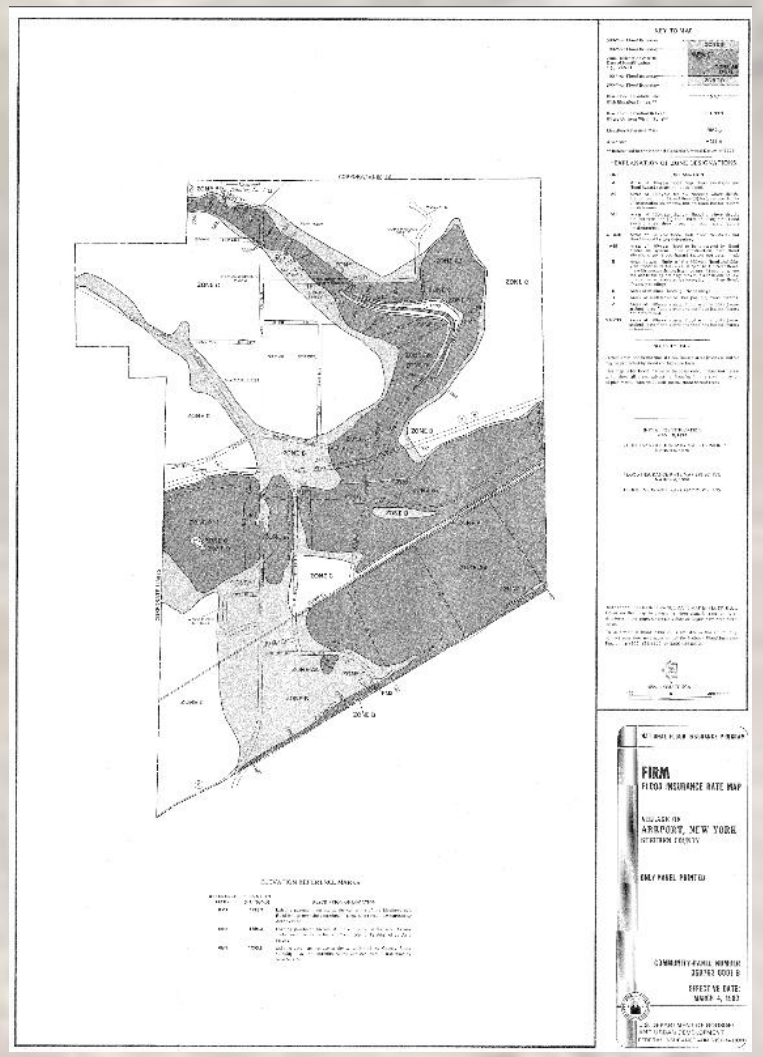
Big Flats, February 2008
(Source: STCRPDB)

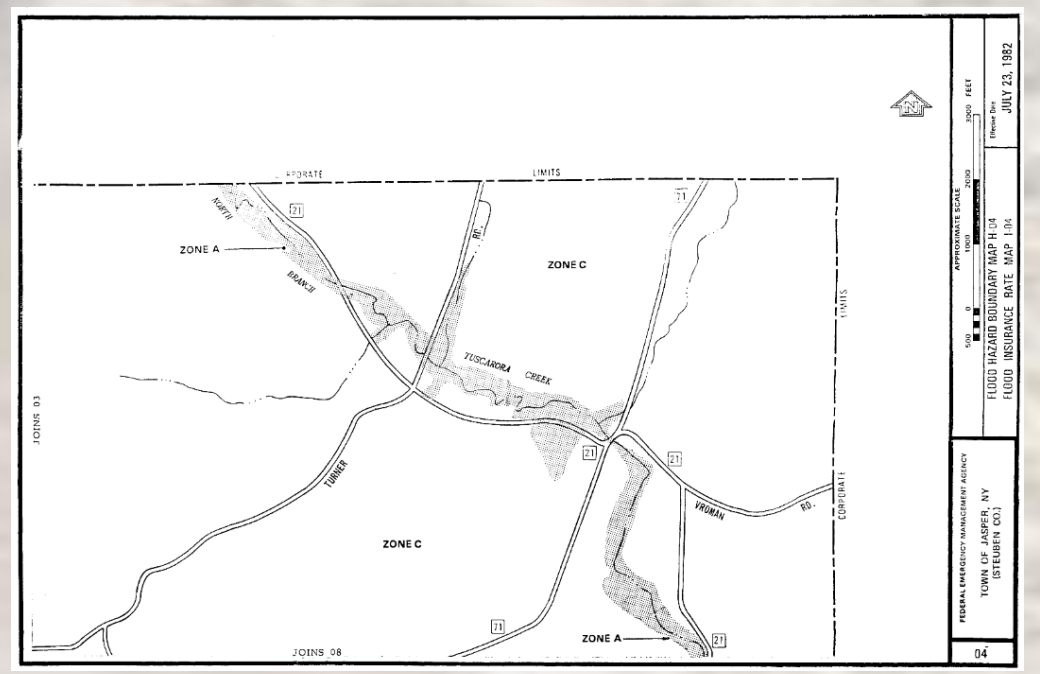


Addison, August 2021

1. Assess the Flood Hazards

Effective Flood Insurance Rate Maps (FIRMs)





Legal flood zones are shown on paper maps

Images of paper FIRMs are available from the FEMA Flood Map Service Center, https://msc.fema.gov

Assess the Flood Hazards

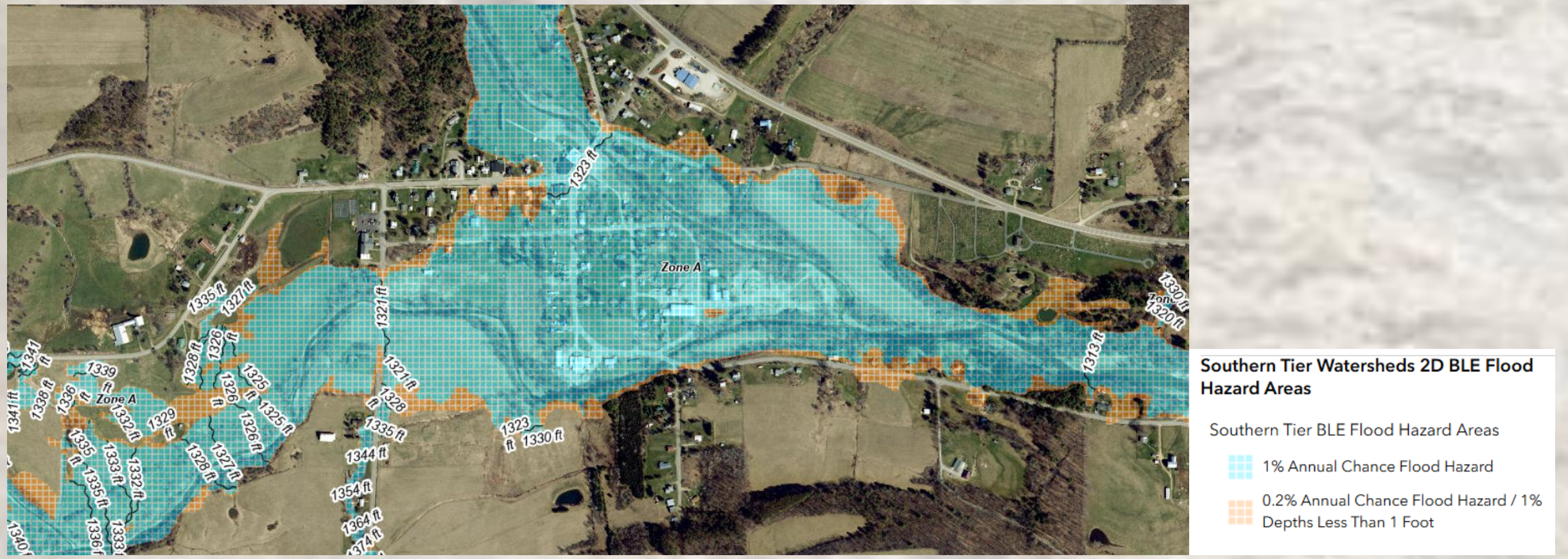
Approximate “FEMA Flood Zones” in GIS



Town of Campbell. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

Assess the Flood Hazards

Base Level Engineering (Woodhull)



Town of Woodhull. Image from FEMA Region 2 Base Level Engineering (BLE) Viewer, https://experience.arcgis.com/experience/59dc63564e9447d79d1c87322a2d0246?org=FEMA

Assess the Flood Hazards

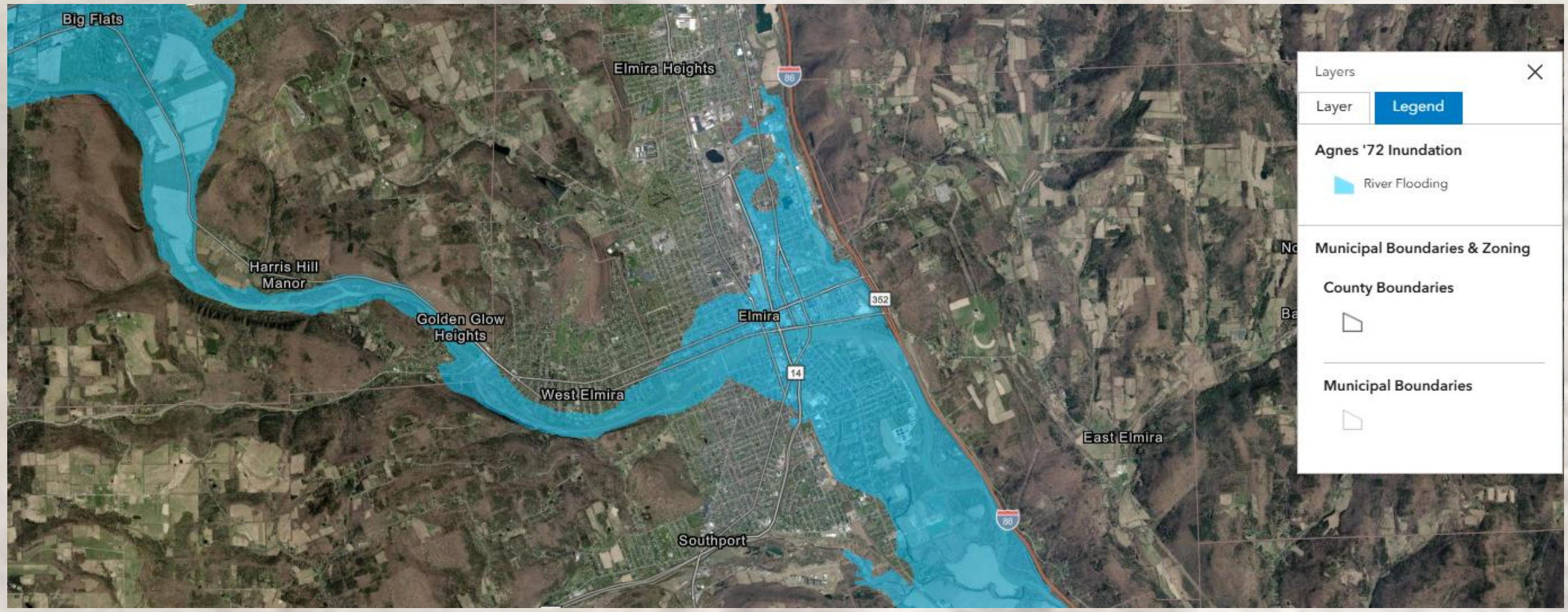
Approximate FEMA Flood Zones (Woodhull)



Town of Woodhull. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

Assess the Flood Hazards

Inundation from Historic Floods – 1972 Agnes



Elmira area. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

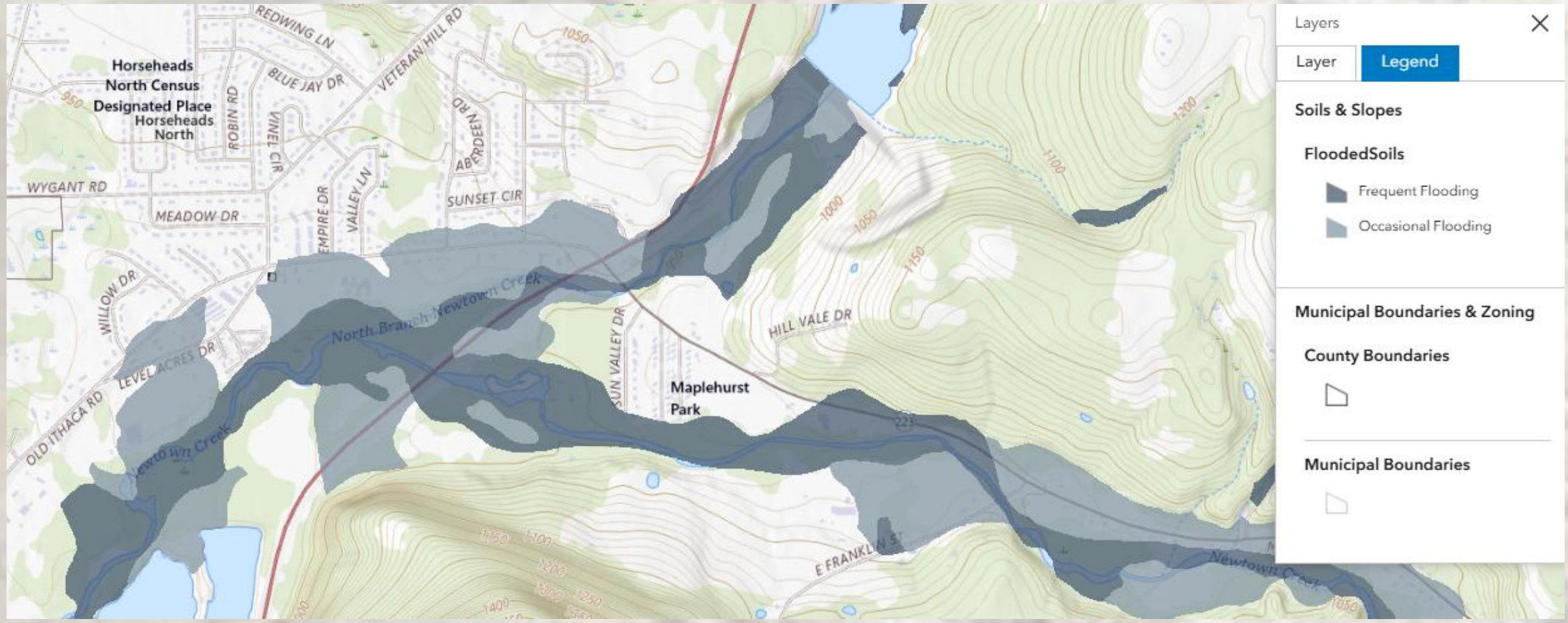
Assess the Flood Hazards
Erosion Hazards



Town of Chemung. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

Assess the Flood Hazards

Flooded Soils



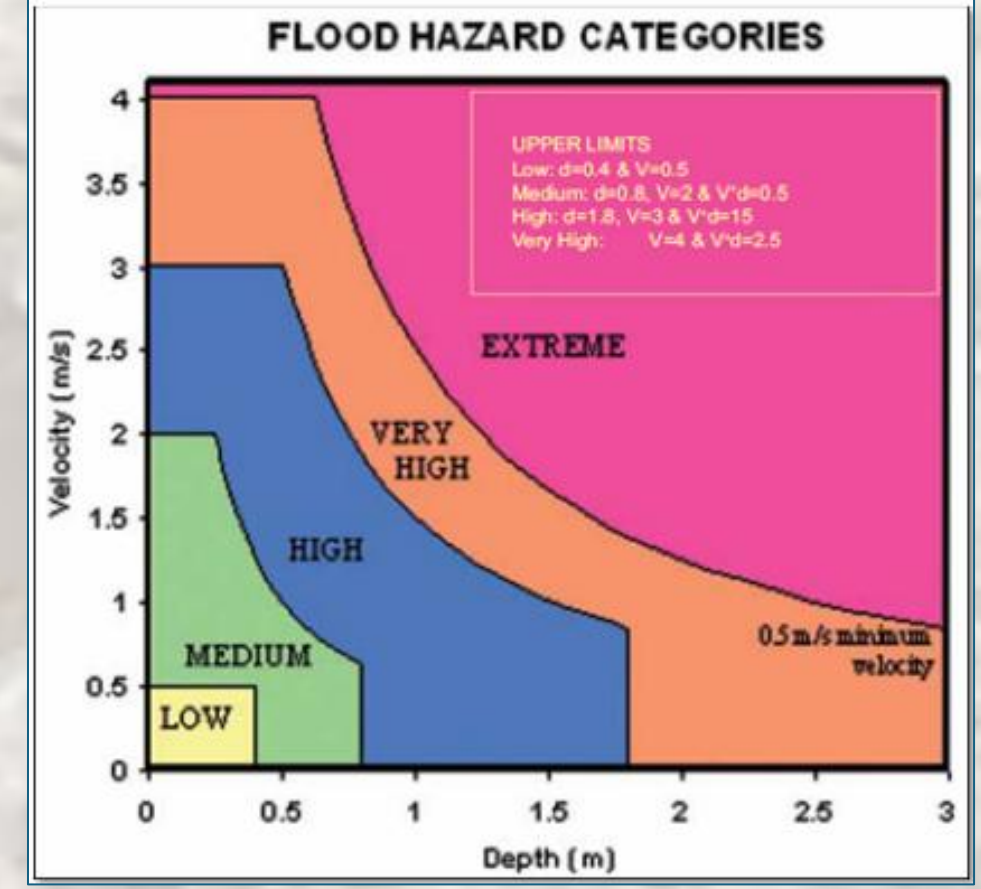
Town of Horseheads. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

2. Identify Areas of Highest Flood Risk

Risks:

- Erosion potential
- Depth of flooding
- High velocity flood water
- Insufficient warning time
- Frequent flooding

Figure 31: Example of Flood Severity Raster Classification



Source: FEMA, 2020 Guidance for Flood Risk Analysis.

Identify Areas of Highest Flood Risk

Available Information:

- Local knowledge
- Base flood elevations
- Floodways – Often the highest risk part of the floodplain
- Stream, lake, river locations – Unmapped flood and erosion hazards can occur along any waterway. Some communities consider anything within 50 or 100 feet of a streambank or shore to be unsafe.



Town of Tuscarora (Source: Steuben County SWCD)

3. Identify Beneficial Natural Features

- Undeveloped floodplains
- Wetlands
- Forests
- Vegetation on steep slopes



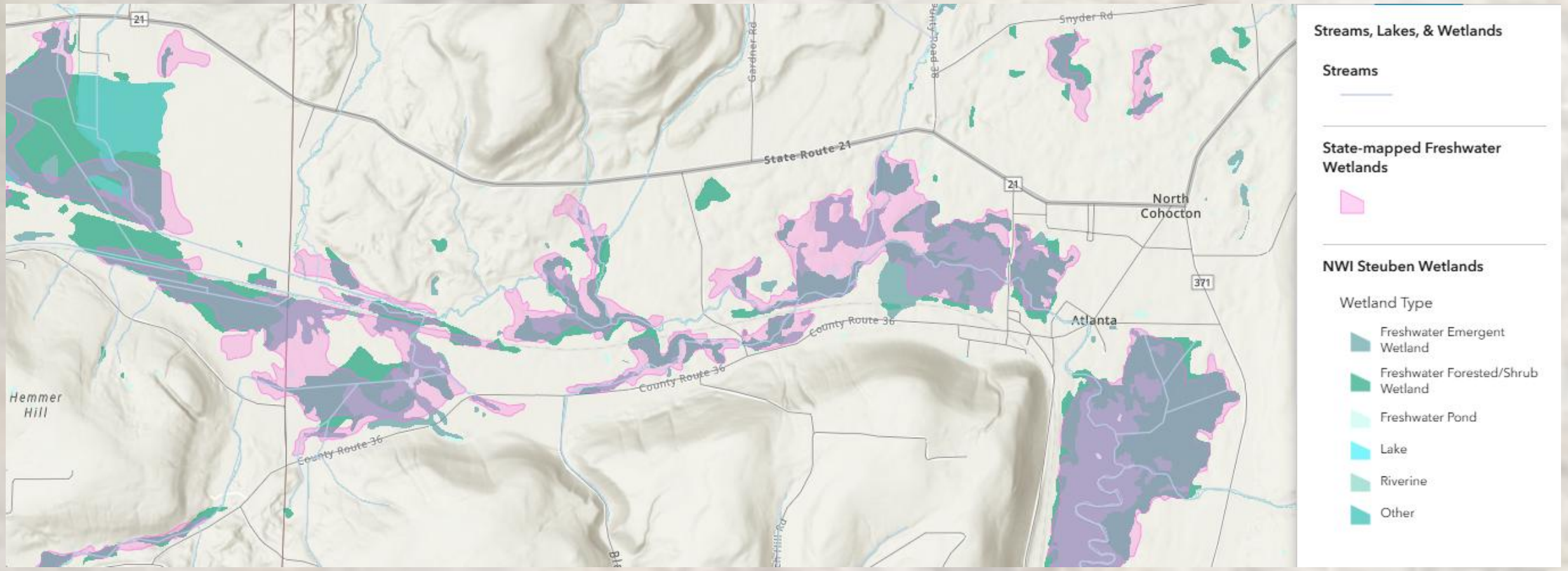
(Source: Upper Susquehanna Coalition)



(Source: Chemung County SWCD)

Identify Beneficial Natural Features

Wetlands



Town of Cohocton. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

Identify Beneficial Natural Features

Steep Slopes



Town of Cayuta. Image from STC Regional Flood Information Map, https://stc-hub-stcgis.hub.arcgis.com/apps/d725d15a119a4bb89b0620a624f165f3

4. Make Room for Water

Objectives:

- Map areas of highest flood risk
- Map areas with erosion risks
- Map beneficial natural areas
- Keep these areas free from vulnerable development
- Preserve and restore beneficial natural features
- Encourage open space or recreational uses



Town of Campbell (Source: STCRPDB)

Make Room for Water

Tools:

- Mitigation
  - Remove existing development
- Restore natural functions
  - Reconnect floodplains
  - Stream restoration
  - Riparian buffer planting/protection
  - Wetlands
- Land use planning & regulations



Floodplain buyout in Town of Van Etten (Source: Chemung County SWCD)



Willow planting, Town of Campbell (Source: J. Demeritt)

Make Room for Water – Land Use Regulations

- Building setbacks
  - Streams, rivers, lakes, wetlands
- Riparian buffers
- Conservation or flood hazard zoning district
- Site plan review criteria
- Subdivision requirements



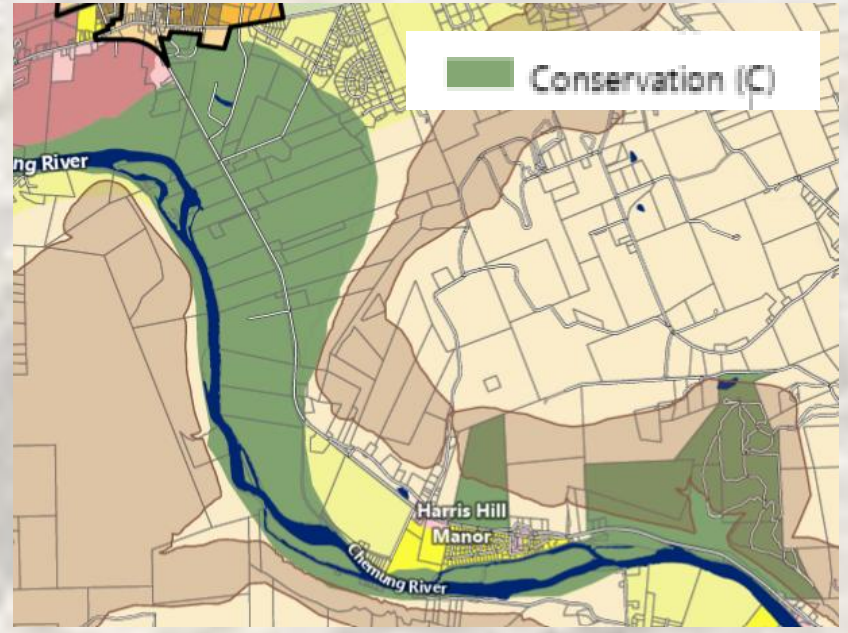
Town of Big Flats (Source: STCRPDB)

Emphasize flood safety objective!

Make Room for Water – Conservation District

Town of Big Flats

- Encompasses part of Chemung River floodway and other environmentally sensitive land
- Supports low intensity recreational and agricultural uses that do not require construction of new buildings
- Site plan approval required
- Filling, storage, and other encroachments on natural drainage or flood flows are prohibited

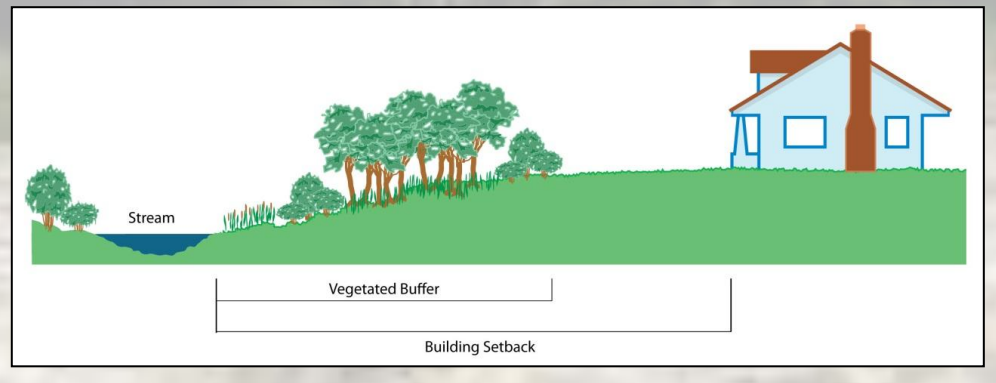


From Town of Big Flats Zoning map, showing Conservation (C) Zone in green

Promote open space, recreation, and agricultural uses

Make Room for Water - Stream Protection in Zoning

Town of Southport



Riparian Buffer – perennial & intermittent streams

- 50 feet from bank
- Protect & enhance native vegetation
- Allowed uses:
  - Recreation
  - Resource protection
  - Stream crossings
  - Public water/sewer

Setback Area – perennial streams

- Additional 50 feet from buffer
- Additional allowed uses:
  - Minor recreational structures
  - Fences, landscaping, mowing
  - Agriculture
- Prohibited:
  - Hazardous materials, sewage systems
  - Waste storage or disposal
  - Mining
  - Motor vehicle parking

5. Live with Floods

In flood-prone areas that can be safely developed:

- Floodproof or elevate existing development
- Encourage flood insurance
- Flood warnings
- Emergency response plans
- Structural projects – levees, dams, channel modification
- Disaster recovery plan
- Land use planning & regulations



Village of Wellsburg (Source: STCRPDB)



Campbell River Gauge (Source: STCRPDB)

Live with Floods - Regulations

Local Law for Flood Damage Prevention

- Maintain training or intermunicipal agreements to improve enforcement
- Regulate additional flood hazard areas, such as Base Level Engineering floodplains
- Compensate for the effects of fill
- Cumulative substantial improvement
- Additional requirements for critical facilities and hazardous materials

Live with Floods - Regulations

Land Use Regulations for Flood-prone Areas

- Application submittal and review criteria
- Flood hazard overlay zone
- Special use permits
- Low density zoning
- Require evacuation plans for campgrounds and other uses



Town of Corning (Source: STCRPDB)

6. Manage Water Where it Falls

- Maintain & improve drainage infrastructure
- Stormwater management for new development
- Manage runoff from existing development
- Manage land use to preserve drainage functions
  - Healthy vegetation
  - Healthy, uncompacted soils
  - Wetlands and other ponding areas



City of Elmira (Source: STCRPDB)



Slow it down…Spread it out…Soak it in

It is the civic duty of local governments to protect the health, safety, and welfare of the people who are served.

Discussion?

James McKinley, CFM
STC Planner
jmckinley@stcplanning.org

Janet Thigpen, CFM
thigpenjanet@gmail.com

