No Adverse Impact Floodplain Management

June 6, 2013

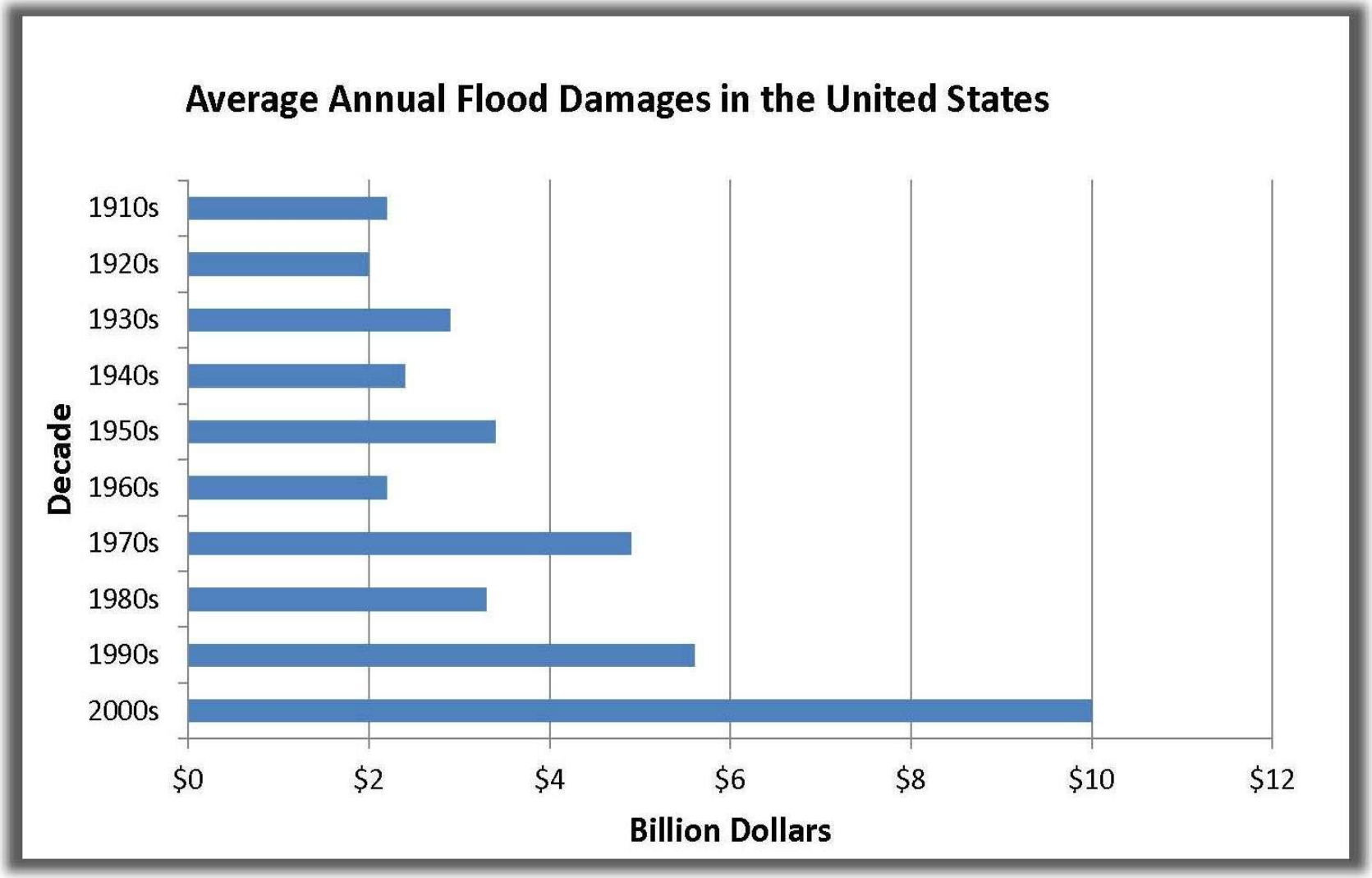
Beth Lucas, Senior Planner

Broome County Planning

No Adverse Impact

- Developed by Association of State Floodplain Managers
- Purposes:
  - Address the shortcomings of typical local floodplain management programs
  - Provide a higher level of protection for citizens
  - Prevent increased flood damage
- Goes beyond federal and state programs

Costs and Impacts of Flooding



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Broome County

Event Type	Total Number of Occurrences	Annual # of Events (average)
Flash Flood	67	1.2
Urban Flood	4	0.07
Flood	61	1.1
Total:	132	2.4

Table 5.4.1-4. Occurrences of Flood Events in Broome County, 1956 – 2011, Broome County Hazard Mitigation Plan

Municipality	Pop SFHA (1% Flood)	% Pop 1% Flood	Pop 0.2% Flood	% Pop 0.2% Flood
Barker (T)	702	25.7	702	25.7
Binghamton (C)	11,387	24.0	15,043	31.8
Binghamton (T)	1,431	29.0	1,431	29.0
Chenango (T)	3,233	28.7	3,584	31.9
Colesville (T)	2,131	40.7	2,131	40.7
Conklin (T)	3,387	62.2	3,847	70.7
Deposit (V)*	480	58.6	583	71.2
Dickinson (T)	1,175	32.3	1,281	35.2
Endicott (V)	4,861	36.3	5,068	37.8
Fenton (T)	2,371	35.5	2,629	39.4
Johnson City (V)	2,521	16.6	3,096	20.4
Kirkwood (T)	2,724	46.5	2,828	48.3
Lisle (T)	1,378	56.7	1,378	56.7
Lisle (V)	149	46.6	149	46.6
Maine (T)	1,544	28.7	1,544	28.7
Nanticoke (T)	1,044	62.4	1,044	62.4
Port Dickinson (V)	1,051	64.0	1,242	75.7
Sanford (T)*	839	52.8	839	52.8
Triangle (T)	581	29.3	581	29.3
Union (T)	9,569	34.4	10,047	36.2
Vestal (T)	7,876	28.1	8,255	29.4
Whitney Point (V)	588	61.0	588	61.0
Windsor (T)	2,488	46.4	2,597	48.5
Windsor (V)	479	52.3	499	54.5
Broome County	**63,989**	**31.9**	**70,986**	**35.4**

Municipality	Replacement Cost Value 1% Flood	Replacement Cost Value 0.02% Flood	Total Loss Payments
Barker (T)	$47,880,233	$85,257,911	$50,073
Binghamton (C)	$1,631,039,145	$2,250,319,760	$15,987,572
Binghamton (T)	$1,372,886	$1,372,886	$924,106
Chenango (T)	$89,031,744	$208,145,481	$1,993,754
Colesville (T)	$91,247,303	$99,780,623	$1,663,581
Conklin (T)	$420,466,228	$568,949,648	$30,439,615
Deposit (V)	$103,445,365	$185,086,612	$2,793,681
Dickinson (T)	$43,399,628	$123,670,593	$1,052,647
Endicott (V)	$518,003,192	$724,763,580	$3,292,194
Fenton (T)	$73,778,731	$137,813,882	$496,624
Johnson City (V)	$255,790,029	$334,608,515	$14,415,601
Kirkwood (T)	$214,967,979	$331,980,863	$7,107,908
Lisle (T)	$15,279,907	$17,401,014	$11,826
Lisle (V)	$21,931,021	$21,931,021	$7,958
Maine (T)	$23,146,877	$23,146,877	$634,263
Nanticoke (T)	$3,462,533	$9,365,198	$54,735
Port Dickinson (V)	$17,571,169	$41,075,261	$363,306
Sanford (T)	$3,013,584	$6,744,851	$179,767
Triangle (T)	$280,659	$280,659	$0
Union (T)	$545,281,586	$692,838,694	$22,028,465
Vestal (T)	$470,406,400	$647,577,960	$23,254,448
Whitney Point (V)	$119,145,473	$119,145,473	$36,457
Windsor (T)	$16,499,814	$19,162,165	$1,252,712
Windsor (V)	$52,171,793	$59,022,589	$113,624
Broome County	**$4,778,613,278**	**$6,709,442,117**	**$128,154,915**

What Is Influencing the Trend?
Increased Property at Risk

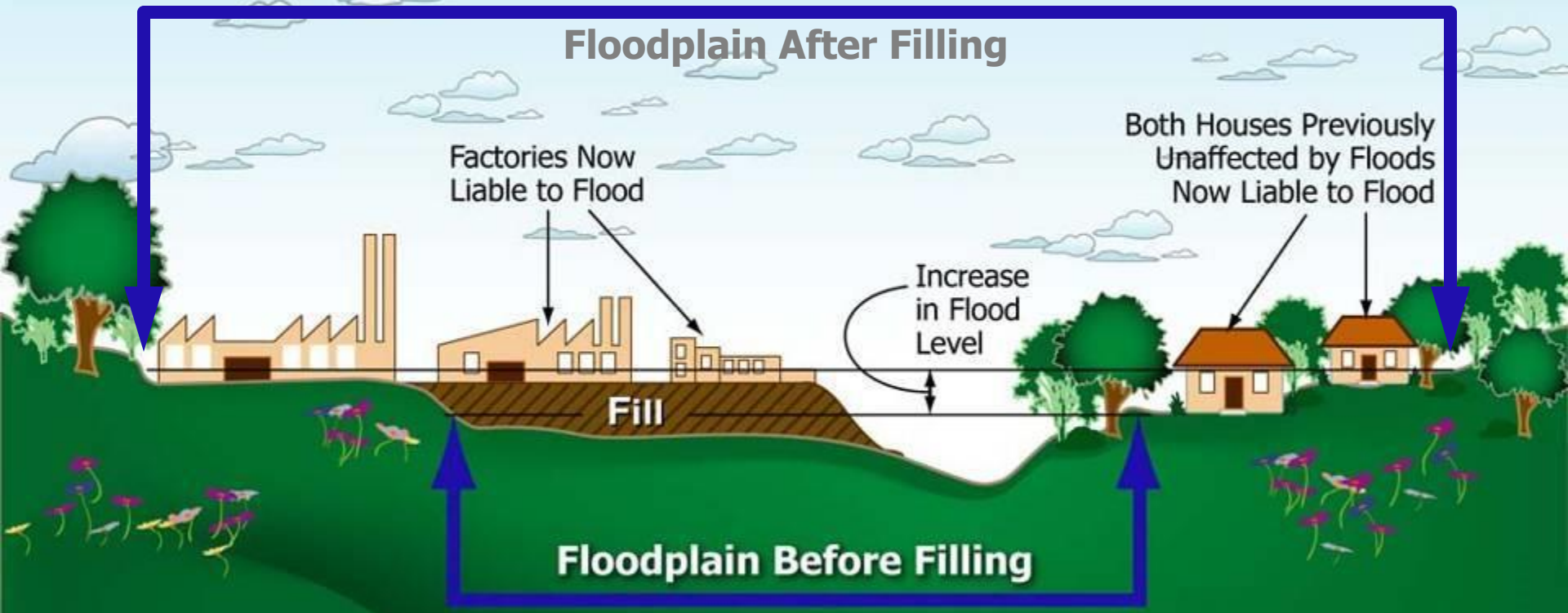
Current policy:

- Promotes use of high risk areas
- Ignores changing conditions
- Ignores adverse impacts to existing properties
- Undervalues natural floodplain functions

Central Message

Even if we perfectly implement current standards, damages will increase.

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.

Why No Adverse Impact?

Flood damages are rapidly increasing ***unnecessarily!***

Current approaches deal primarily with *how to build in a floodplain vs. how to minimize future damages*

No Adverse Impact Explained

NAI is a concept/policy/strategy that broadens one's focus to include how changes to the built environment potentially impact other properties.

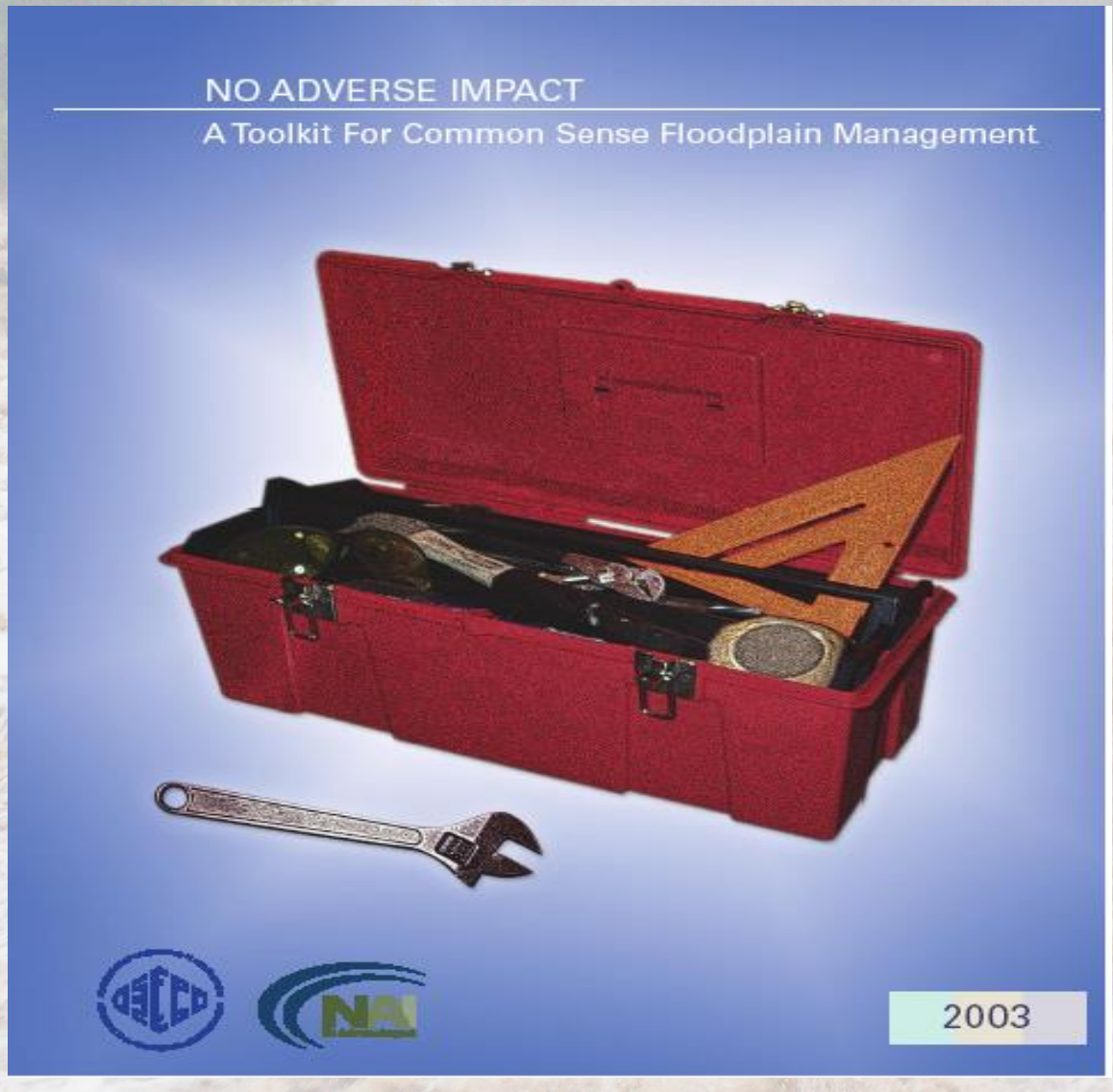
NAI broadens property rights by protecting the property rights of those that would be adversely impacted by the actions of others.

No Adverse Impact Defined

Activities that could adversely impact flood damage to another property or community will be allowed only to the extent that the impacts are mitigated or have been accounted for within an adopted community-based plan.

www.floods.org

- Publications and Policy tab
- Publications
- No Adverse Impact



http://floods.org/index.asp?menuID=745&firstlevelmenuID=188&siteID=1

Community Activities that Can Incorporate NAI:

1. Hazard identification
2. Education and outreach
3. **Planning**
4. **Regulations and standards**
5. Mitigation actions
6. Infrastructure
7. Emergency services

1. Hazard Identification

Basic

- Flood Insurance Rate Maps (FIRM)

Better

- Fill the data gaps
- Map hazards not mapped by FEMA
  - – Stream bank erosion
  - – Ice jams
  - – Debris and sediment blockage
  - – Active River Areas
  - – Levee-protected areas
  - – Areas flooded if dams fail
  - – Areas that have flooded in the past
  - –Localized drainage problems

2. Education and Outreach

Basic

- Reactive - Answer questions about flood zones and development requirements

Better

- Proactive - Outreach projects targeting specific audiences
- Key messages:
  - Know your flood hazards
  - Understand how your actions could adversely affect others
  - Protect your property and your neighbors' property

EMERGENCY SERVICES
FIRE
RESCUE
EMS
911
EMERGENCY MANAGEMENT
BROOME N.Y. COUNTY

BROOME COUNTY FLOOD TASK FORCE

UPPER SUSQUEHANNA COALITION
www.us-cc.org

SRBC

BTSC
Broome-Tioga Stormwater Coalition

Broome County Soil & Water

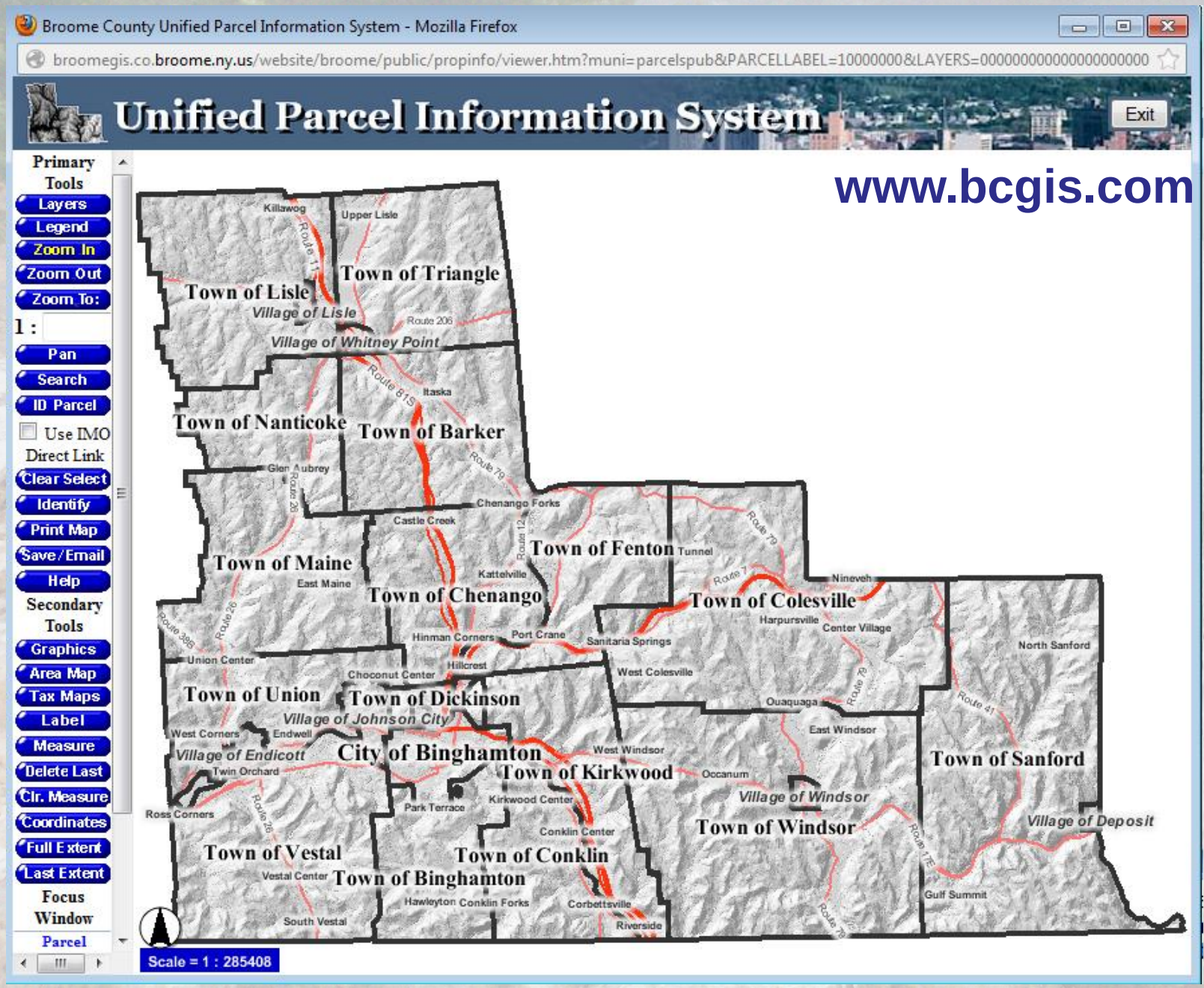
Cornell Cooperative Extension
Broome County

3. Planning

Basic

- Identify mapped flood zones in comprehensive plans
- Identify natural areas (e.g., steep slopes, wildlife habitat, forests, drinking water source areas)

  ► Identify key natural resource areas for protection in municipality's parks and open space plan.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Zoom Out
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Pan
Search
ID Parcel
Use IMO Direct Link
Clear Select
Identify
Print Map
Save/Email
Help
Secondary Tools
Graphics
Area Map
Tax Maps
Label
Measure
Delete Last
Clr. Measure
Coordinates
Full Extent
Last Extent
Focus Window
Parcel
Killawog
Upper Lisle
Route 11
Town of Triangle
Town of Lisle
Village of Lisle
Route 206
Village of Whitney Point
Route 81S
Itaska
Town of Nanticoke
Town of Barker
Glen Aubrey
Route 26
Route 79
Chenango Forks
Castle Creek
Route 12
Town of Fenton
Tunnel
Route 79
Town of Maine
East Maine
Kattelville
Town of Chenango
Route 7
Nineveh
Town of Colesville
Harpursville
Center Village
Route 26
Route 369
Hinman Corners
Port Crane
Sanitaria Springs
North Sanford
Union Center
Hillcrest
Choconut Center
West Colesville
Town of Union
Town of Dickinson
Ouaquaga
Route 79
Route 41
Village of Johnson City
West Corners
Endwell
East Windsor
Village of Endicott
City of Binghamton
West Windsor
Town of Sanford
Twin Orchard
Town of Kirkwood
Ocanum
Village of Windsor
Park Terrace
Kirkwood Center
Ross Corners
Route 26
Conklin Center
Village of Deposit
Town of Windsor
Route 17E
Town of Vestal
Town of Conklin
Vestal Center
Town of Binghamton
Gulf Summit
Hawleyton
Conklin Forks
Corbettsville
South Vestal
Riverside
Scale = 1 : 285408

Fact-finding

- past, present, and future land use;
- hydrologic/hydraulic analysis;
- soil types;
- slope of the land;
- rainfall amounts;
- creek characteristics (size, shape, slope, and roughness); and
- structural measures in place (culverts, bridges, etc.).

Write Specific Policy Statements

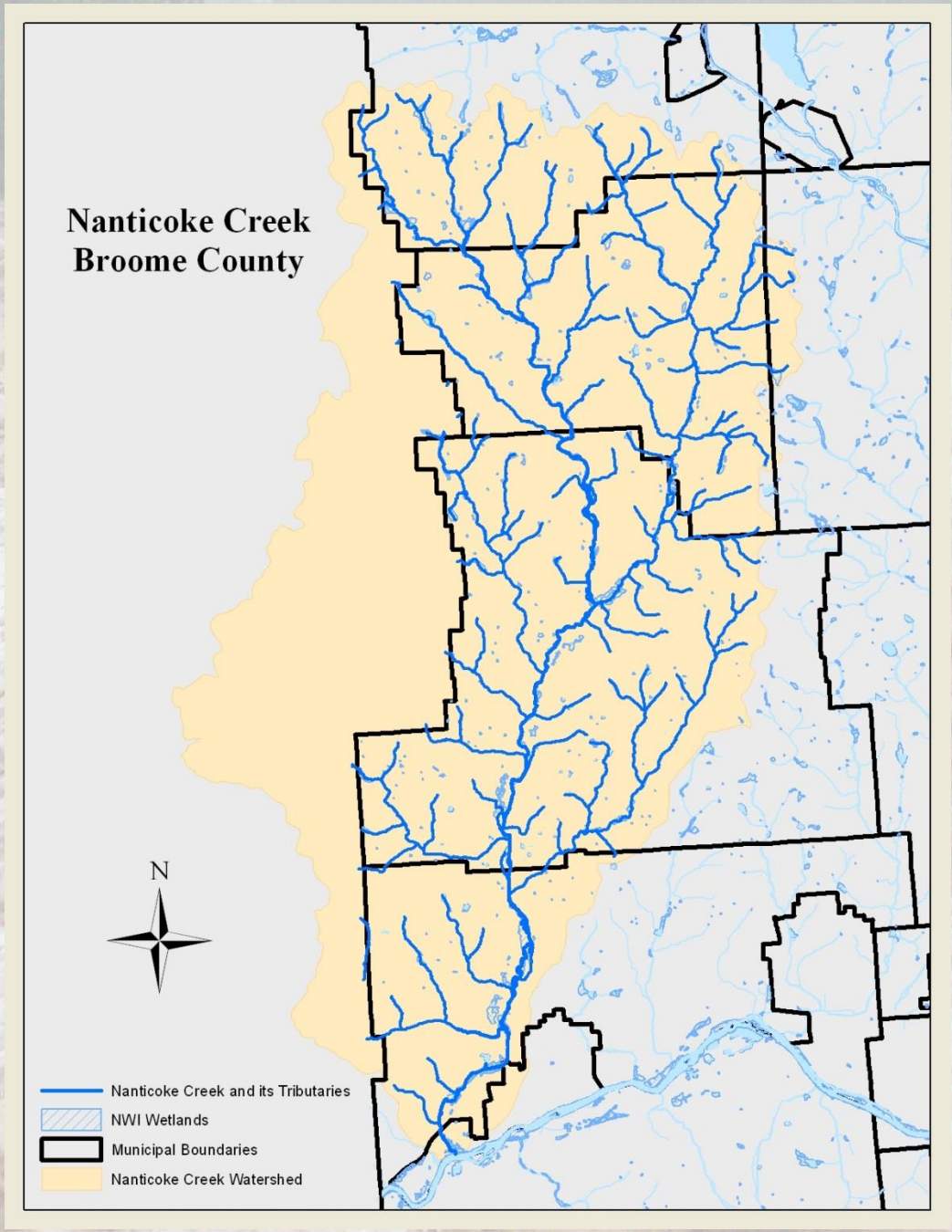
To strengthen the comprehensive plan's role in conserving the environment, the community can include explicit statements embracing a conservation ethic for protecting nature, as well as specifying what the community wants to accomplish. Consider this example from the Town of Yorktown in Westchester County:

"Yorktown's natural resources are integral to the long-term health, safety, and well-being of not only Yorktown but also neighboring towns and the region. The town should expand efforts to preserve open space and natural resources throughout Yorktown. The ecological integrity of Yorktown's natural resources including groundwater, streams and wetlands, trees and woodlands, steep slopes, and areas rich in biodiversity must be maintained and protected, even as new development occurs."

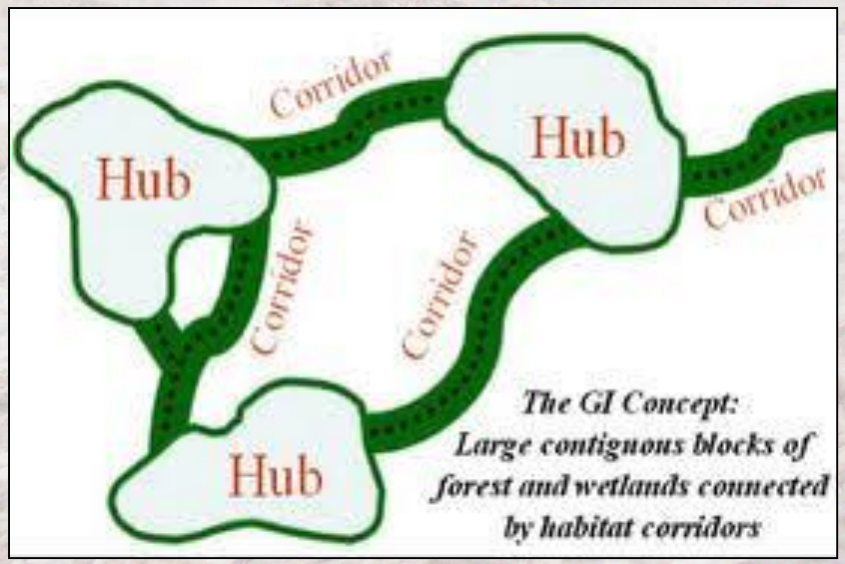
Better

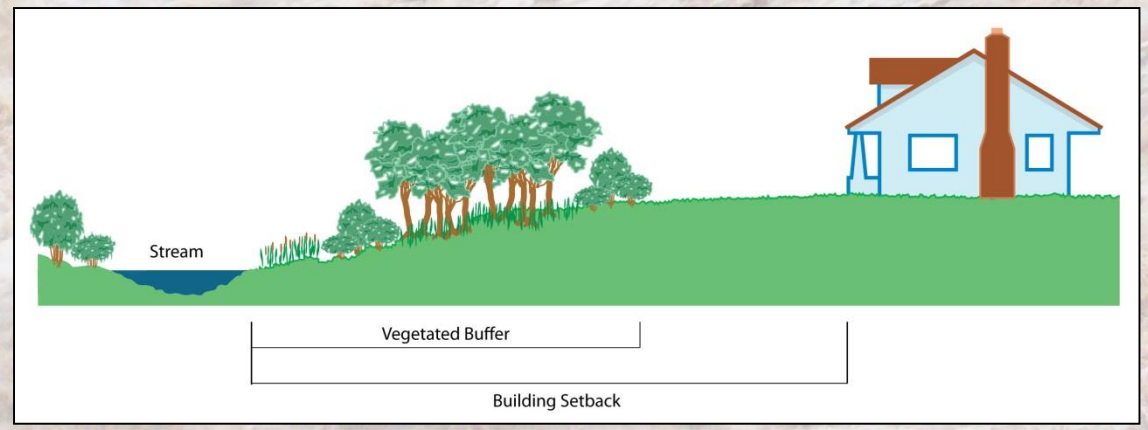
- Coordinate with Surrounding Communities
  - ► Joint Planning or Studies
- Identify Your Ecological Region and Watershed
  - ► (1) a characterization of water and land resources; (2) an inventory of stresses or threats to the natural resources; and (3) conservation and management strategies to improve or protect the watershed

- Nanticoke Creek Watershed
  - ► 2 Counties
  - ► 6 Municipalities



- Green infrastructure planning
  - ►Open space design and management
  - ►Riparian buffers
    - Vegetated buffer/setback
    - Native vegetation
    - Allowable uses





Best

- Floodplain management or multi-hazard mitigation plans
- Plan must be adopted by the municipality in order to obtain funding under certain FEMA programs.
- In adopting the hazard mitigation plan a community is committing itself to incorporating hazard mitigation activities into their comprehensive plan; zoning; capital expenditure plans; and other local land use activities.

Broome County plan is currently awaiting FEMA approval:
www.gobroomecounty.com/planning/hazardmitigation

Multi-objective planning

- Housing
- Transportation
- Open Space
- Utilities and Community Facilities
- Economic Development
- Water Supply
- Stormwater

Other planning opportunities

- SEQRA and local environmental review laws
- Conservation or Environmental Boards
- Critical Environmental Areas

4. Regulations and Standards

Basic

- Local Flood Damage Prevention laws
- Floodplain development requirements in Residential and Building Codes

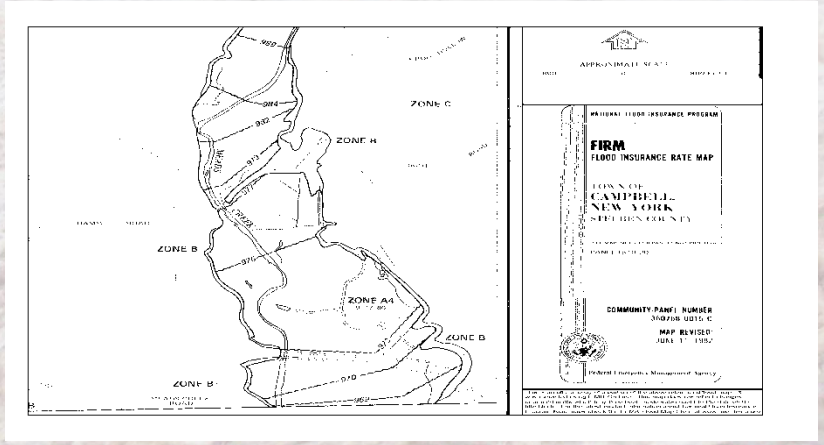
Better

- Higher standards for floodplain development
- Address flood hazards in land use regulations

Basic - Floodplain Development Standards

Local Law for Flood Damage Prevention

- References Flood Insurance Rate Maps (FIRMs)
- Local permit



- Proposed development must be reasonably safe from flood damage
- Proposed development shall not result in physical damage to any other property

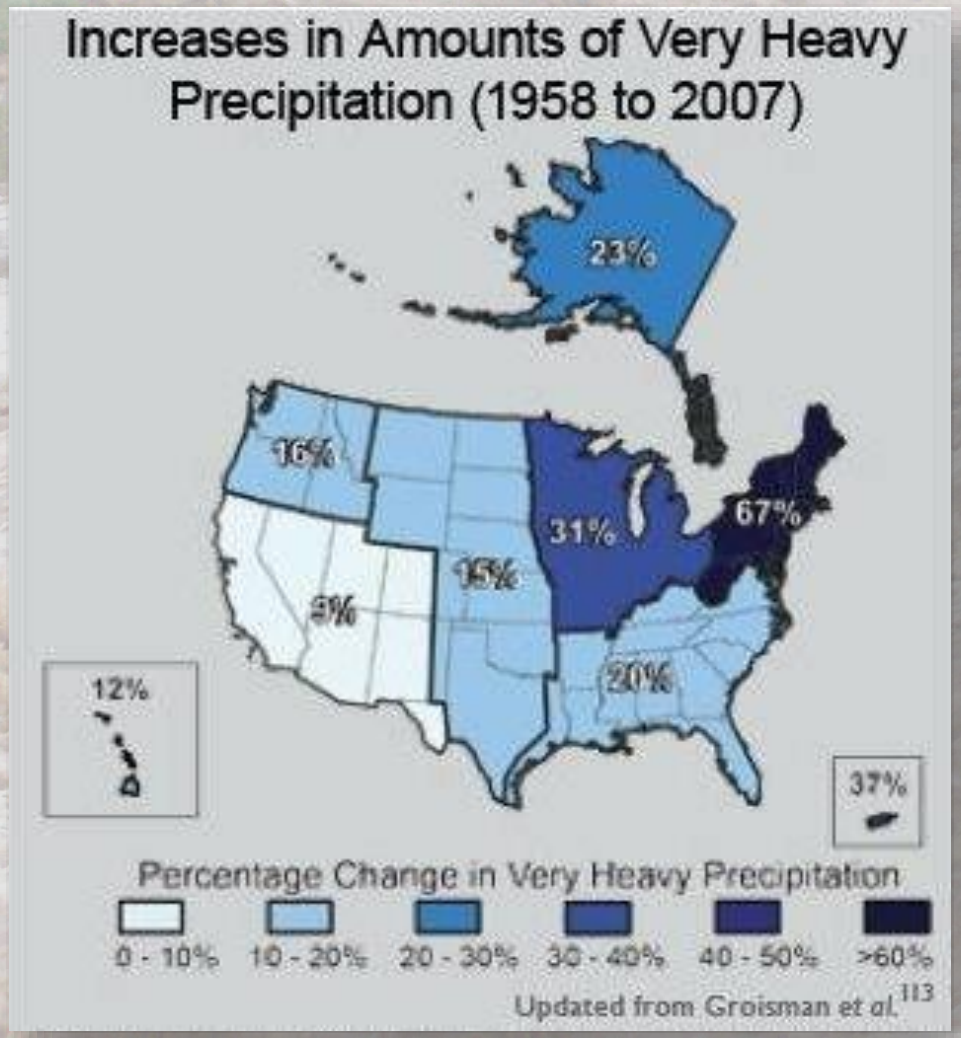
Shortcomings:
Flood Hazard Maps

Maps don't account for

- Increased development in the watershed
- Ditches
- Debris blockage
- Larger and more frequent storms

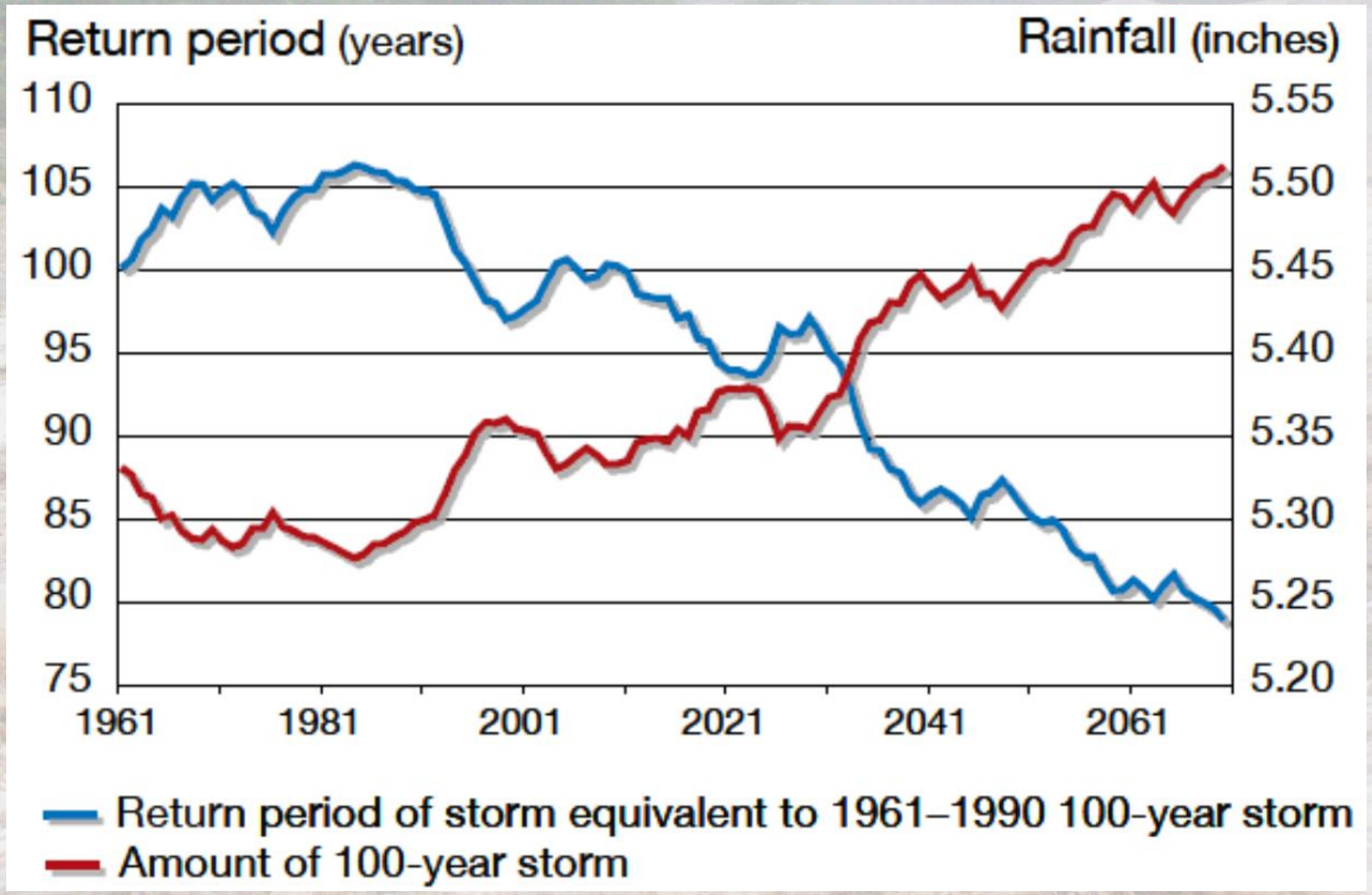
Shortcomings:

What Is the Design Storm?



The northeastern US has experienced a 67% increase in very heavy precipitation events.*

*National Climatic Data Center

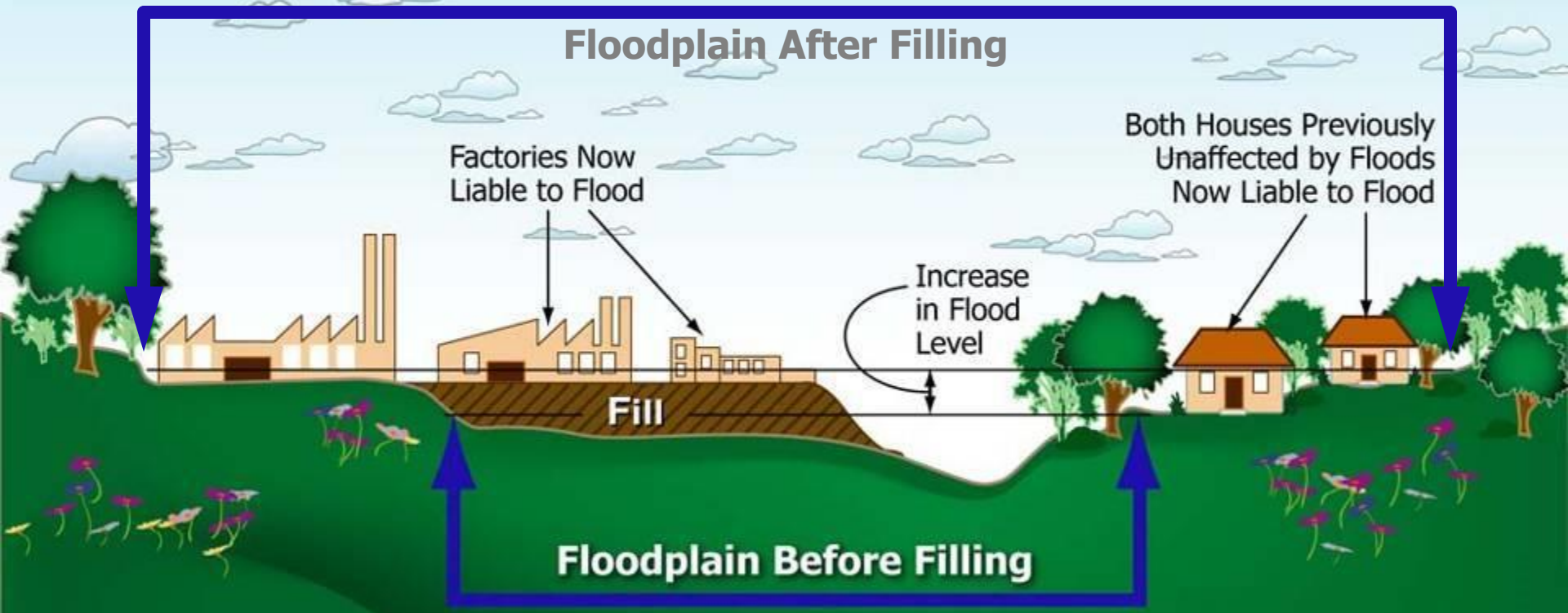

Return period (years)
Rainfall (inches)
110
105
100
95
90
85
80
75
5.55
5.50
5.45
5.40
5.35
5.30
5.25
5.20
1961
1981
2001
2021
2041
2061
Return period of storm equivalent to 1961–1990 100-year storm
Amount of 100-year storm

Shortcomings: Minimum Standards

Standards don't account for

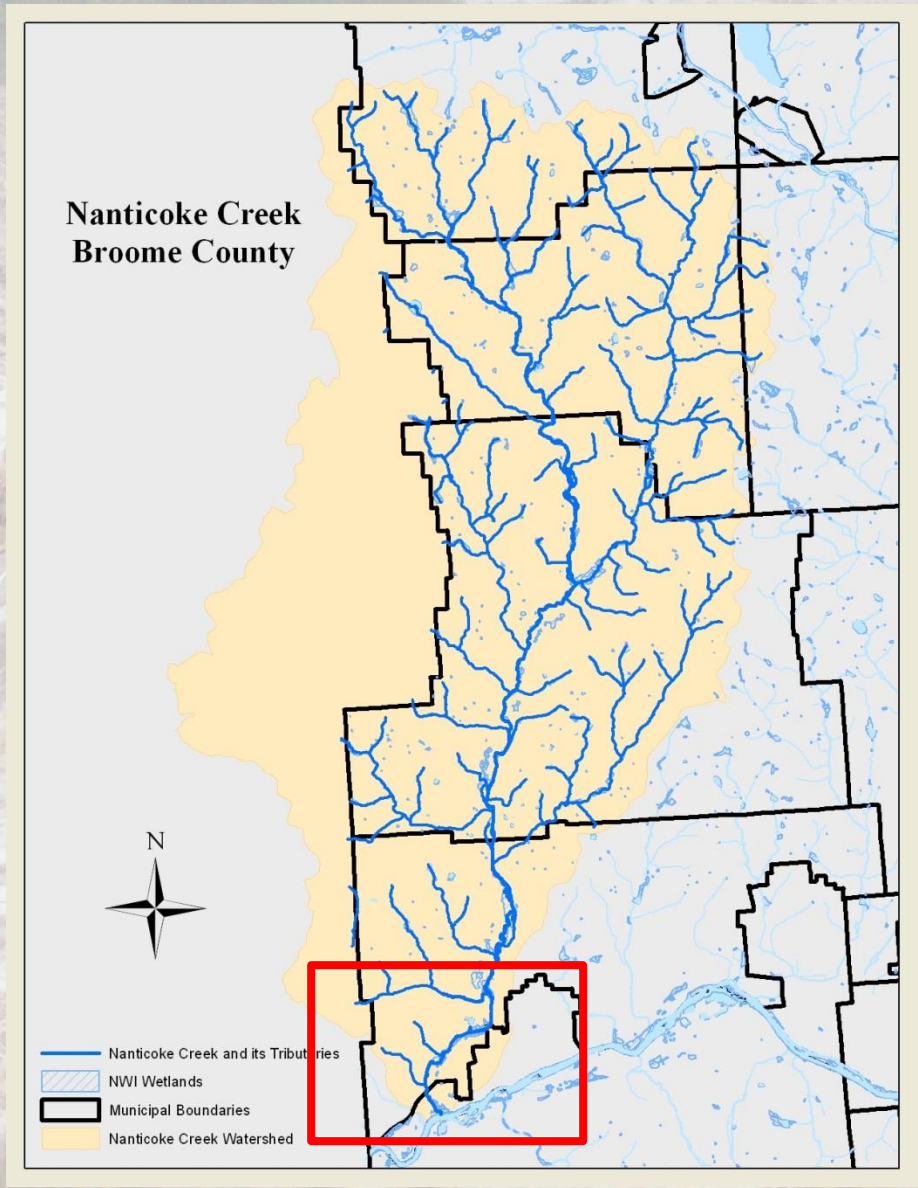
- Erosion
- Sediment
- Safety

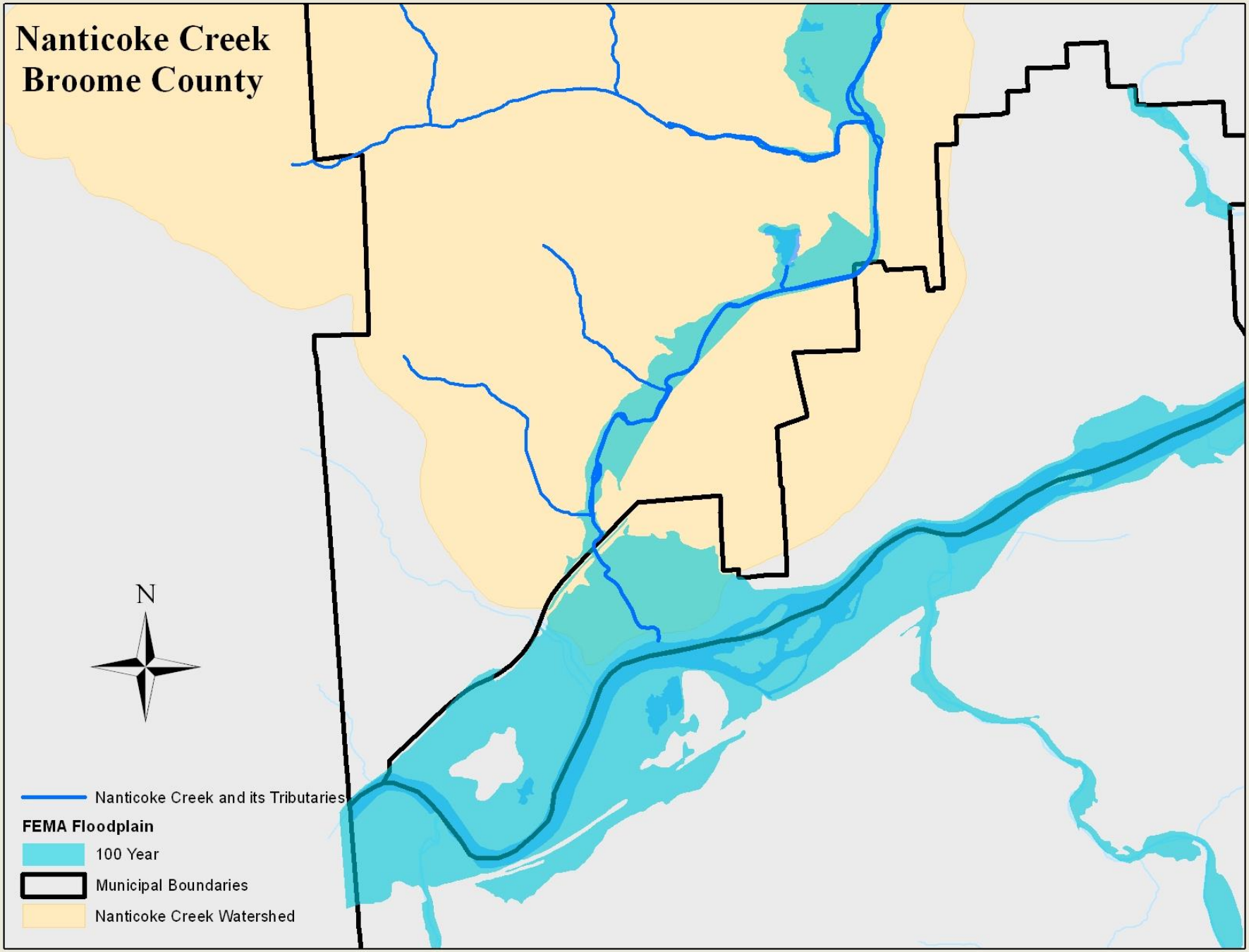
Today's Floodplain Is Not Necessarily Tomorrow's Floodplain

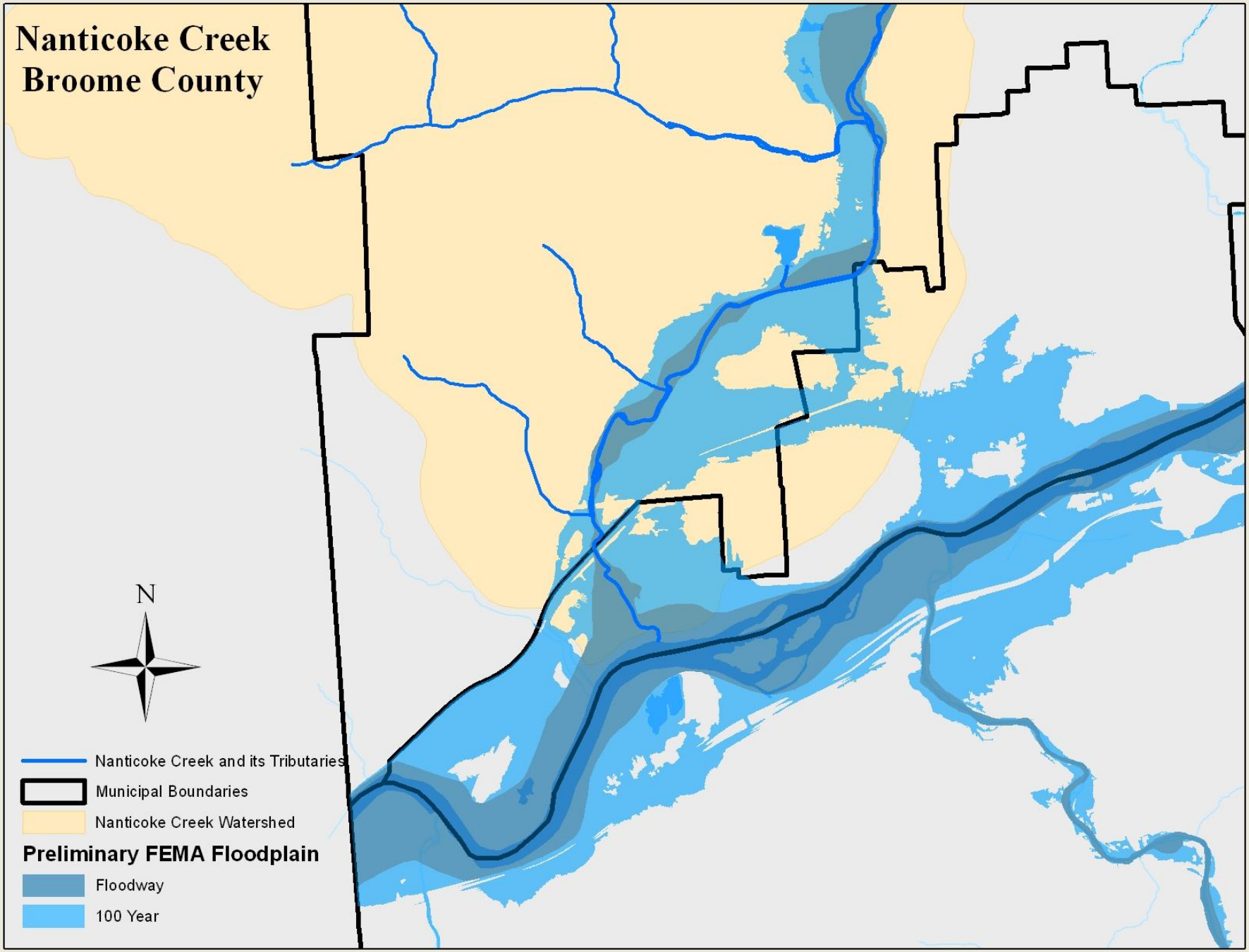


If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters.
This means your home or business may be impacted.

Shortcomings: Outdated Resources




Nanticoke Creek
Broome County
N
Nanticoke Creek and its Tributaries
FEMA Floodplain
100 Year
Municipal Boundaries
Nanticoke Creek Watershed


Nanticoke Creek
Broome County
N
Nanticoke Creek and its Tributaries
Municipal Boundaries
Nanticoke Creek Watershed
Preliminary FEMA Floodplain
Floodway
100 Year

Better – Higher Standards for Floodplain Development

- Freeboard – require higher elevation
- Fill – prohibit or restrict the amount of fill
- Compensatory storage – new fill must be offset by excavating floodable area
- Critical facilities – prohibit or higher standards
- Hazardous materials – restrict or implement standards for use, storage, and disposal
- Substantial improvement – lower threshold from 50% to 30%

Better – Higher Standards for Floodplain Development

Floodways (areas where engineer must certify that project will not increase flood elevations)

- Regulate entire 100-year floodplain as floodway
- Require floodway analysis for large projects in "approximate floodplains"
- Prohibit or limit development and re-development

Better – Higher Standards for Floodplain Development

- Map additional flood hazard areas
  - Map dam failure inundation areas, levee-protected areas, or locations with historic flooding problems
  - Reference map in definition of “areas of special flood hazard”
- Regulate areas beyond flood zone boundary
  - Apply building elevation requirements to areas where the ground elevation is within two feet above the Base Flood Elevation (100-year flood level)

Better - Land Use Regulations

Zoning Requirements

- Restrictions in mapped floodplain / floodway
  - Low density zoning
  - Define “appropriate uses”
- Protect sensitive natural areas
  - Stream and shore setbacks for buildings
  - Require site plan review within stream buffer
- Conservation zone
- Overlay district for floodplain, stream corridor, erosion hazard area, or buffer zone

Better - Land Use Regulations

Site Plan Review and/or Special Use Permits

- Show flood zones and all existing structures
- Show protection of stream corridors
- Private stream crossings
  - Require engineering analysis
- Every lot must have a building site above the flood level
- Show emergency vehicle access route during a flood

Better - Land Use Regulations

Subdivision Standards

- Flood zones must be shown on plat
- Compensatory storage must offset the loss of flood storage capacity due to fill
- Protect stream corridors, wetlands, etc.

Better - Land Use Regulations

Other Opportunities

- Stream dumping regulations
  - Prohibit dumping or storage in and near streams
- Stormwater management
  - Promote compliance with state standards
  - Enact higher local standards
  - Timber harvesting regulations
  - Driveway standards

5. Mitigation Actions

Basic

- Flood Insurance
- Structural projects – levees, dams
- Stormwater management
- County Hazard Mitigation Plans

Better

- Restore natural floodplain functions
- Protect individual structures
  - Elevation
  - Acquisition
  - Floodproofing

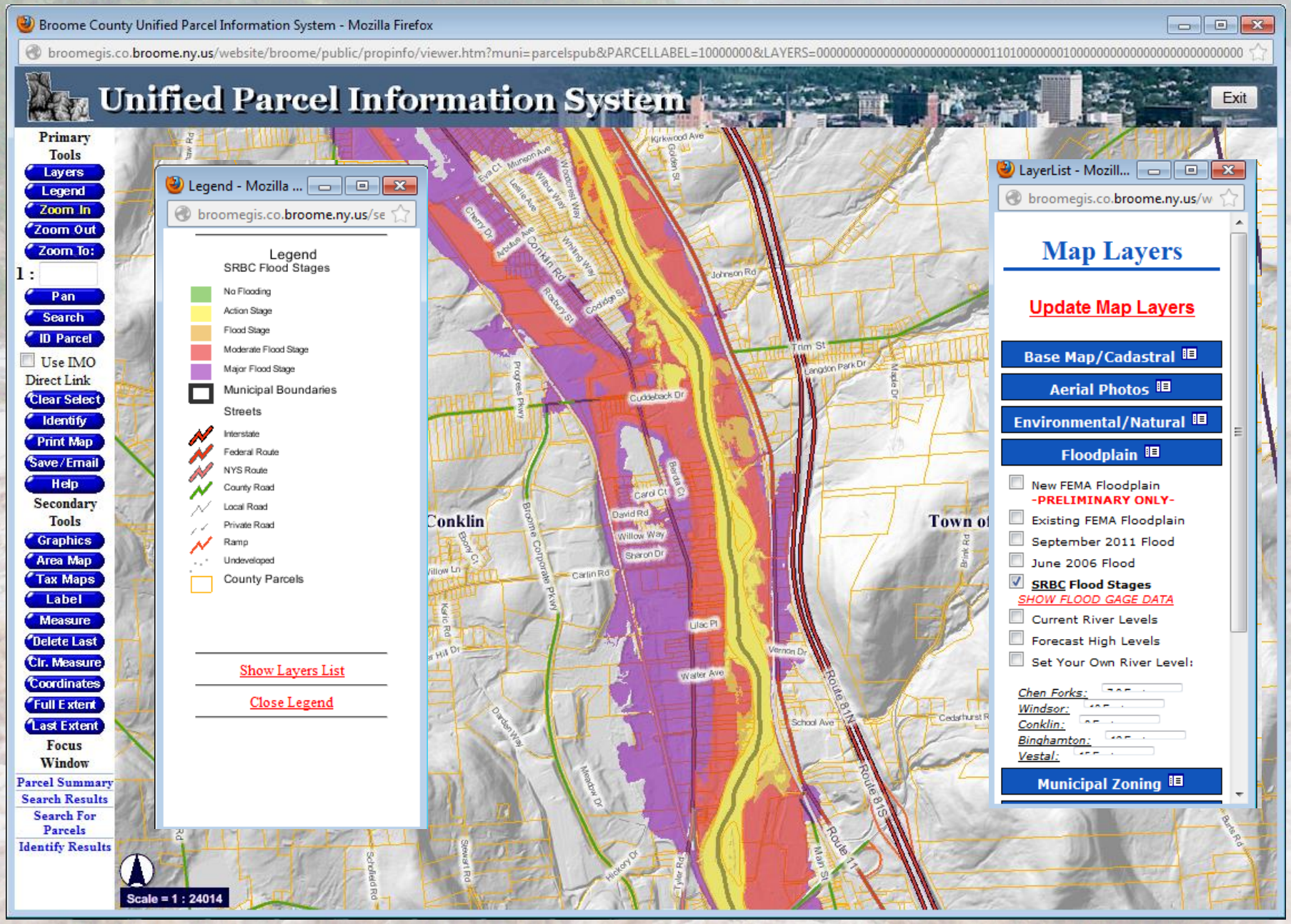
6. Infrastructure

Basic

- Repair after each flood

Better

- Inspect and maintain drainage systems
- Improve drainage systems without transferring the problems elsewhere
- Protect critical facilities (listed in HMP)
- Don’t put water or sewer lines in the floodplain
- Green infrastructure: streamside forests, native vegetation, grass swales, natural sheet flow, wetlands, etc.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1 :
Pan
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ID Parcel
Use IMO Direct Link
Clear Select
Identify
Print Map
Save/Email
Help
Secondary Tools
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Area Map
Tax Maps
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Full Extent
Last Extent
Focus Window
Parcel Summary
Search Results
Search For Parcels
Identify Results
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SRBC Flood Stages
No Flooding
Action Stage
Flood Stage
Moderate Flood Stage
Major Flood Stage
Municipal Boundaries
Streets
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NYS Route
County Road
Local Road
Private Road
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Map Layers
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Aerial Photos
Environmental/Natural
Floodplain
New FEMA Floodplain
-PRELIMINARY ONLY-
Existing FEMA Floodplain
September 2011 Flood
June 2006 Flood
SRBC Flood Stages
SHOW FLOOD GAGE DATA
Current River Levels
Forecast High Levels
Set Your Own River Level:
Chen Forks:
Windsor:
Conklin:
Binghamton:
Vestal:
Municipal Zoning
Conklin
Town of
Kirkwood Ave
Johnson Rd
Trim St
Langdon Park Dr
Cuddeback Dr
Carol Ct
David Rd
Willow Way
Sharon Dr
Carlin Rd
Lilac Pl
Vernon Dr
Walter Ave
School Ave
Route 81N
Route 81S
Route 11
Broome Corporate Pkwy
Conklin Rd
Scale = 1 : 24014

Legal Research

- Courts have modified common law doctrines to require an increased standard of care over time
- Hydraulic, hydrologic, and geologic models facilitate proof of causation
- Act of God defense has been greatly reduced due to ability to predict hazard events

Legal Research

- Defense of sovereign immunity has been greatly reduced
- Communities most apt to have to pay:
  - –not when they deny permit, but
  - – **when development they permit causes damage to others,**
    - damage is easily predictable (which is easier to do with better computer models and technology)

Actions Your Community Can Take

- Evaluate your hazards and programs
- Identify existing adverse impacts in the floodplain and throughout the watershed
- Require adverse impacts to be mitigated when development occurs

CONCLUSION

Current Approaches Create Future Disasters

If we continue to encourage at-risk development and ignore the impact to others, can we accept the consequences…

… and, are you willing to pay for it?

Thank You

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