



Flood Resiliency Workshop  
October 14<sup>th</sup> , 2015  
Mark Watts-District Manager

# Paul Harvey



Rest of the Story

# There is no “Silver Bullet”

- Discuss limitations
- Successful Tools
- Future Options



# **Issues Facing Communities to Become Flood Resilient**

- Short Term Memories
- Funding
- We Often Lack the Willingness to Make Tough Decisions





1972

Lake St.  
NY













**ISLAND UNTO ITSELF** — Water surrounds the St. Joseph's Hospital complex and Medical Arts Center (far left) as swollen streets and cars around the complex.





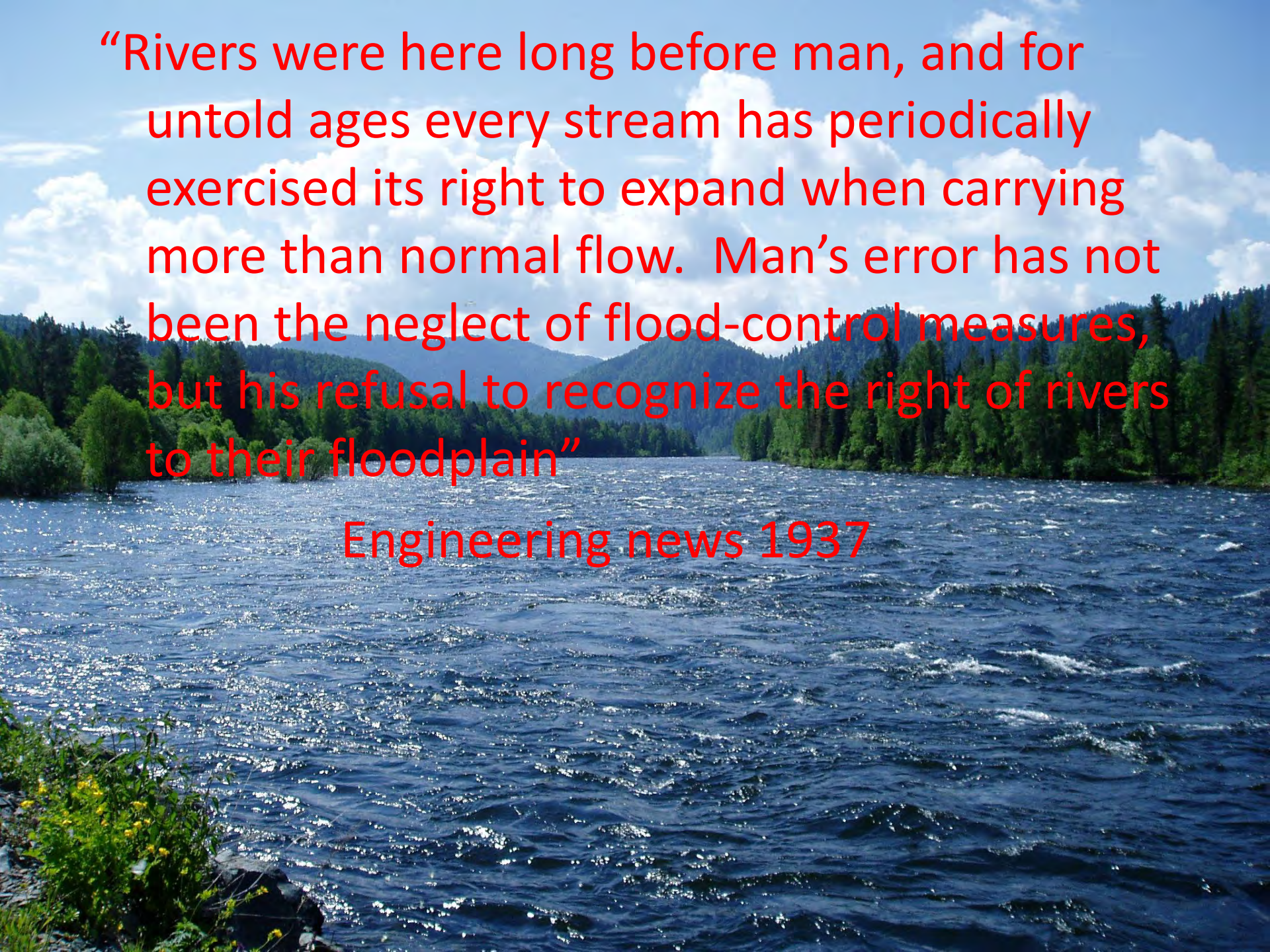


08/28/2011

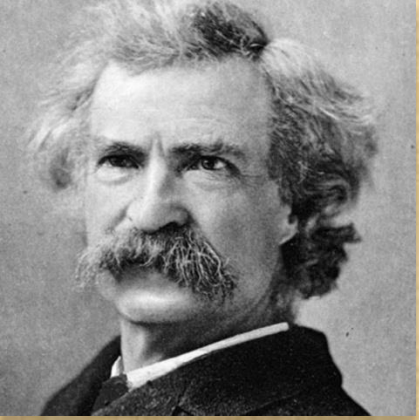


“Rivers were here long before man, and for untold ages every stream has periodically exercised its right to expand when carrying more than normal flow. Man’s error has not been the neglect of flood-control measures, but his refusal to recognize the right of rivers to their floodplain”

Engineering news 1937





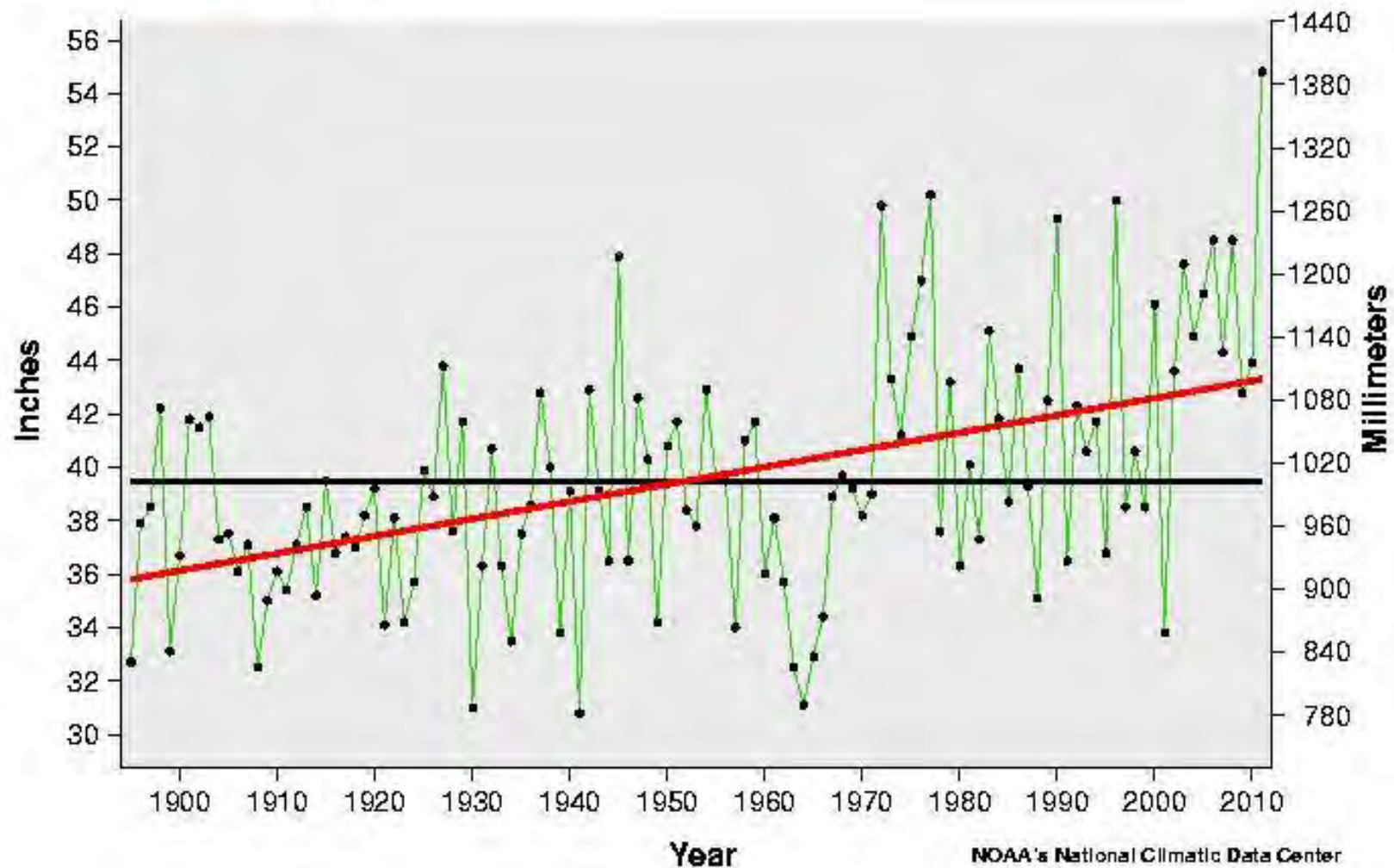


*“....ten thousand river commissions, with the mines of the world at their back, cannot tame that lawless stream, cannot curb it or define it, cannot say to it ‘Go here,’ ‘Go there’, and make it obey; cannot save a shore which it has sentenced, cannot bar its path with an obstruction which it will not tear down, dance over, and laugh at”*

*-Mark Twain, Life on the Mississippi*

**Annual 1895 - 2011 Average = 39.54 Inches**  
**Annual 1895 - 2011 Trend = 0.65 Inches / Decade**

- Actual Precipitation
- Average Precipitation
- Trend



# Getting Real About Rainfall Rates

**“We have seen a 67% increase in the number of 2-inch rainfall events occurring over a 48-hour period since the 1950s.”**

**Climate Change Facts, Dept. of Earth & Atmospheric Sciences, Cornell University**

Storms are *more frequent* and *more extreme* than they used to be. Have you noticed?



# Increase in Rainfall Rates, Nationwide



The map shows the percent increase in very heavy precipitation events (defined as the heaviest 1 percent of all daily events).

There are clear trends toward more heavy precipitation for the nation as a whole, particularly in the Northeast and Midwest.



“Floods are acts of God, but  
flood losses are largely acts of  
man”



Gilbert F. White, “the father of floodplain management”

# **Many Lack an Understanding of How**

- ❖ Streams Functions

- ❖ Floodplains Functions

- ❖ Wetlands Function

- ❖ Flood Insurance Program Functions

- ❖ What can be the Ramifications of Implementing Bad Practices



**Development on the floodplain can lead to significant stream issues including erosion & infrastructure damage**







08/28/2011







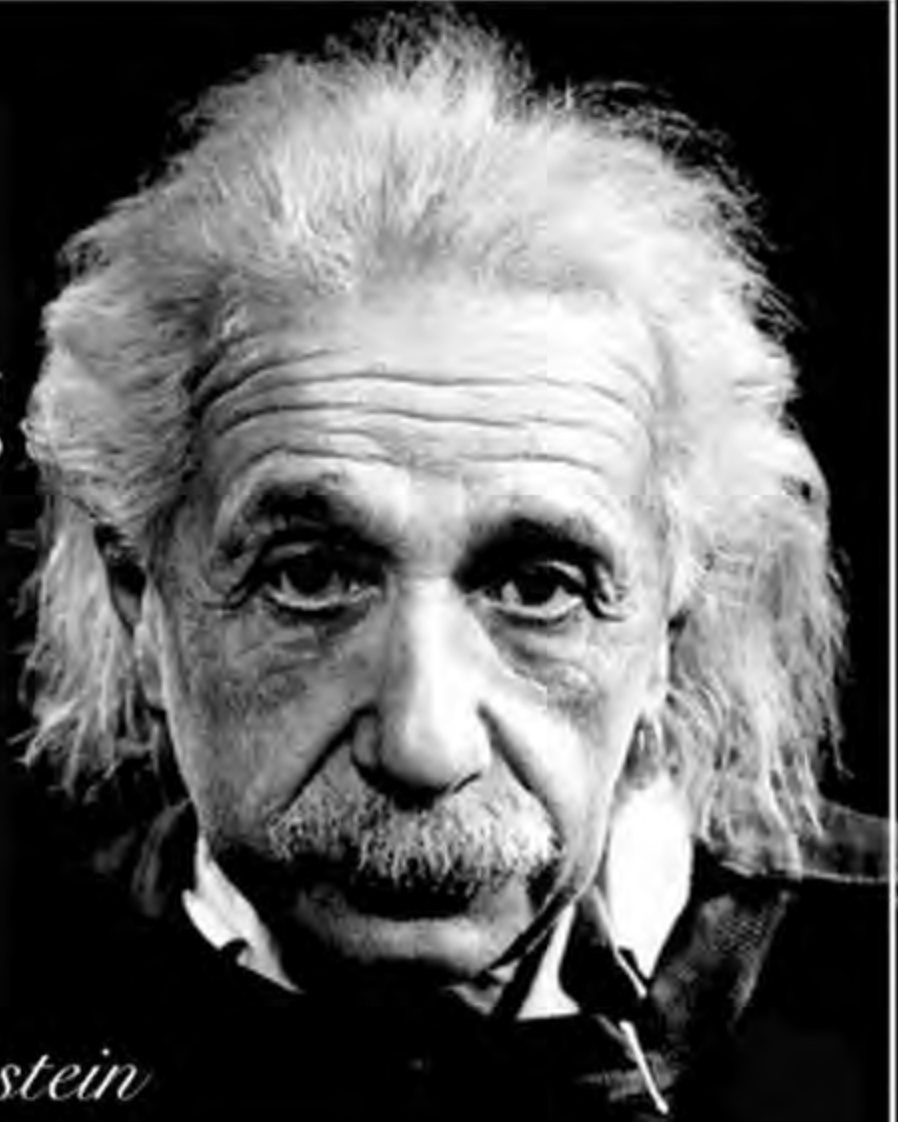






Insanity:  
doing the same thing  
over and over again  
and expecting  
different results.

*- Albert Einstein*











# Floodplain Definition

*The floodplain is the area bordering a stream, constructed by the river and inundated during periods of high flow.*

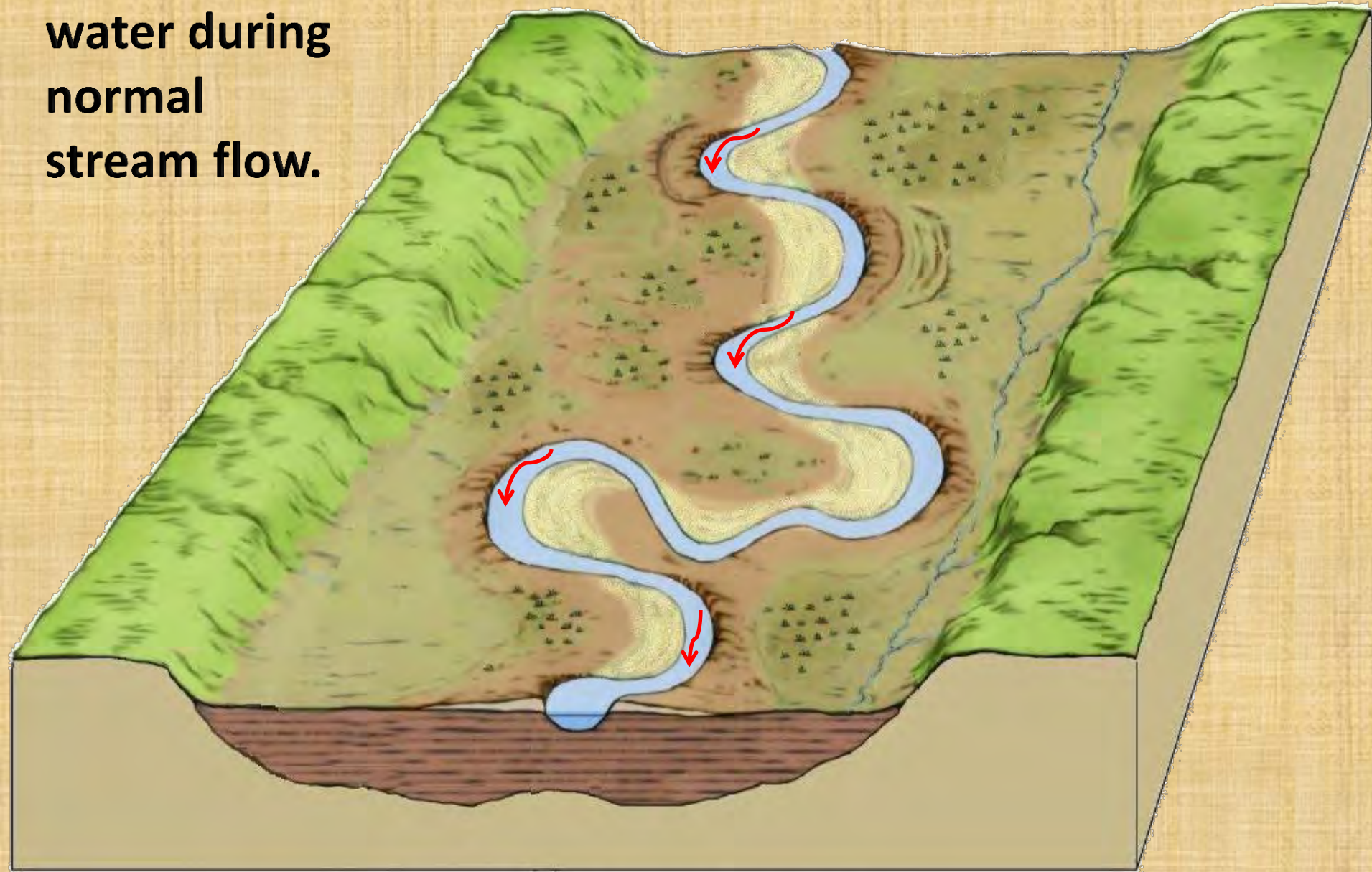


# Floodplain Function

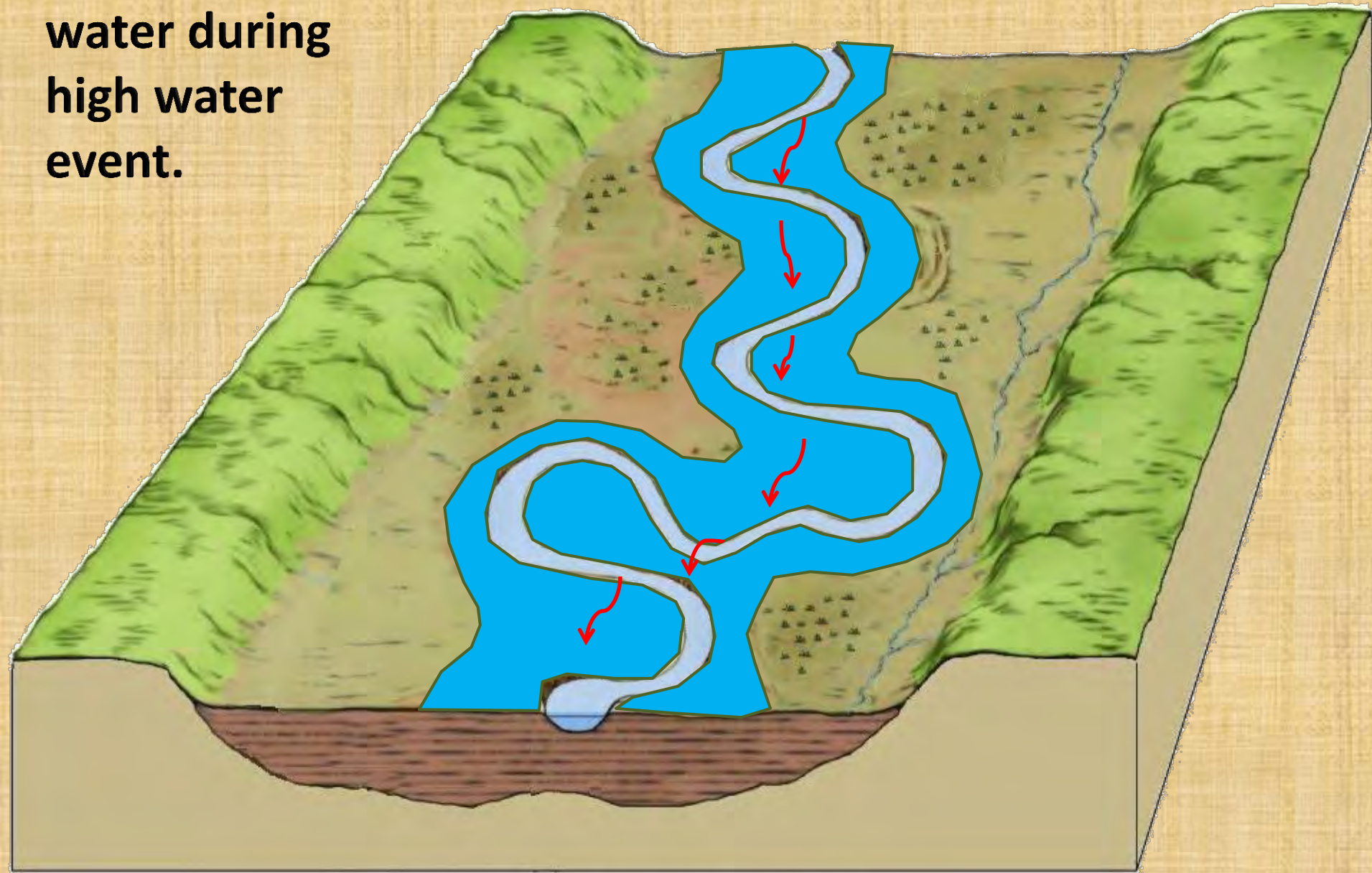
- Energy dissipation during flooding events
  - Velocity and energy decreases
- Lowers flood peaks due to storage and infiltration
  - Water released more slowly downstream
- Provide a place for debris and sediment to be deposited
  - Natural process of topsoil formation



**The flow of  
water during  
normal  
stream flow.**



**The flow of  
water during  
high water  
event.**





**Development on the floodplain can lead to significant stream issues including erosion & infrastructure damage**













# What happens if we fill in floodplains for development?



Village of Walton - before



# What happens when streams are reconnected to their natural floodplains?



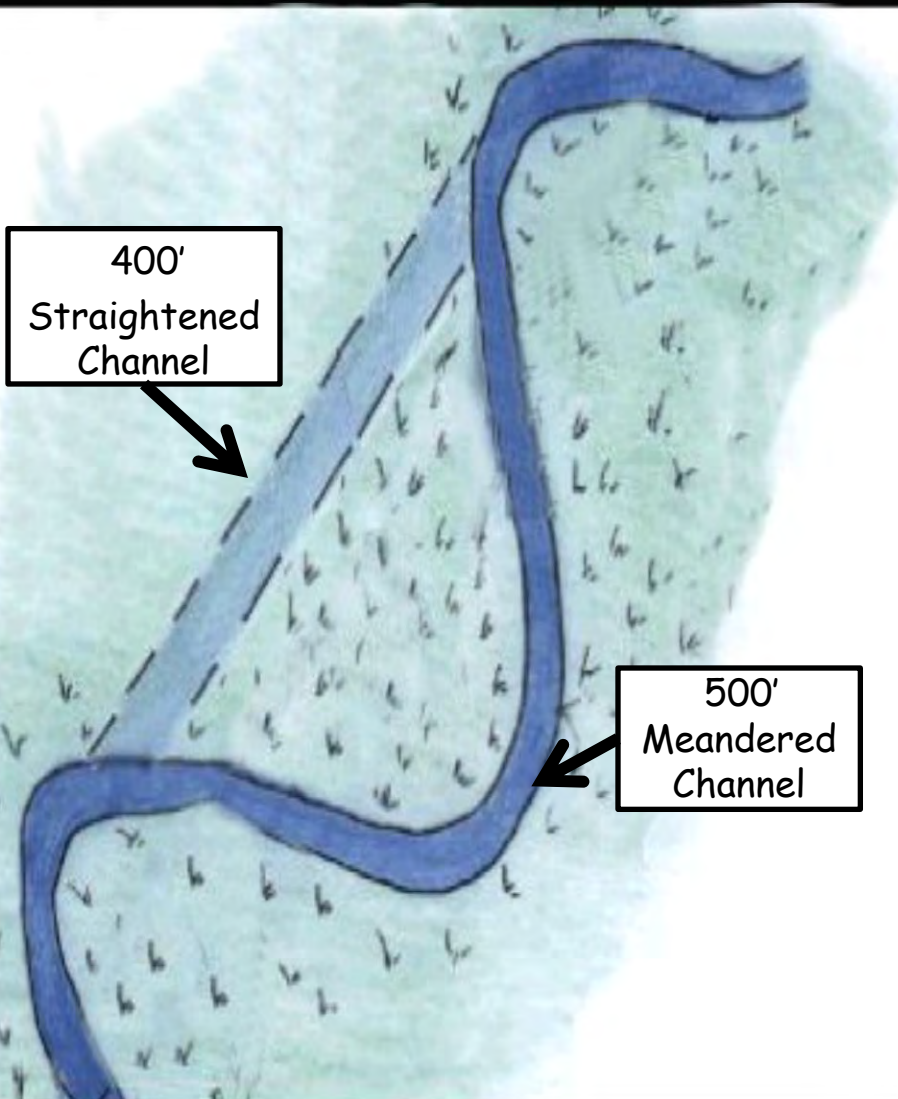
Village of Walton - after



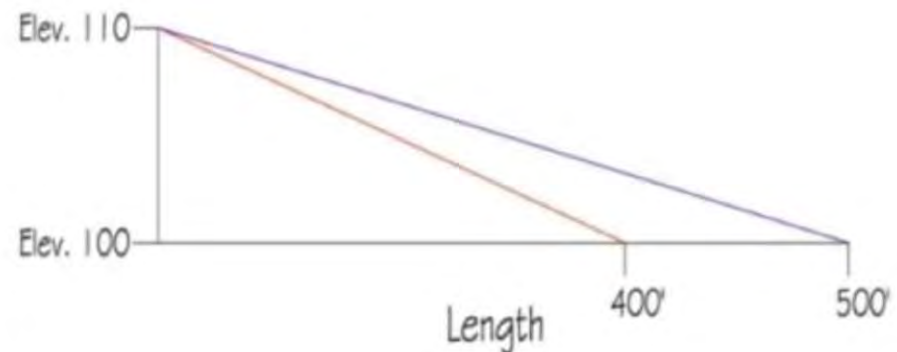




# Channel Straightening



- Shorter distance means a steeper slope
- A steeper slope increases velocity
- A steeper slope increases erosion on the streambank and bed





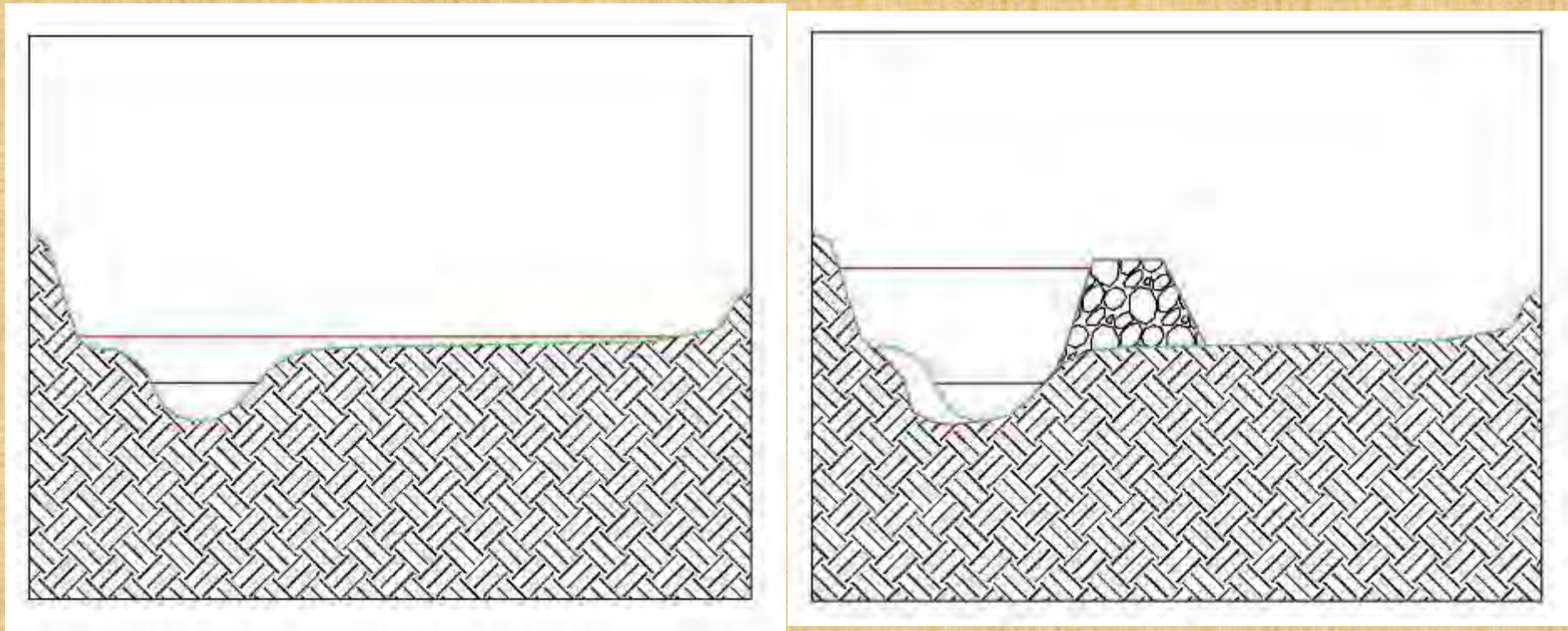
# Channel Straightening





# Berms Definition

An earthen embankment or wall, usually built to provide protection or a result of side casting during stream channel dredging



**A False Sense of Flood Protection**



# Berms





# Berms





# Berms – Failure





# Berms – Failure





















# City of Elmira Flood Control Program



Constructed between 1941 & 1946  
57,100' of earth levee  
9,500' of concrete floodwall  
\$300,000 per year maintenance cost

1963

County made application for  
assistance under PL-566 Program

Newtown –Hoffman Creek



# Newtown Hoffman Watershed Project

Diven Creek Pump Station: 1973-\$164,000.00

Marsh Dam 1975-\$ 337,000.00

Park Station 1978-\$3,693,000.00

Hoffman Dam 1978-\$ 740,000.00

East Sullivanville Dam 1990-\$4,730,000.00

Jackson Creek Dam 1999-\$ 1,635,000.00

**\$11,299,000.00**



# Marsh Dam

A wide-angle photograph of a grassy hillside, likely a dam, sloping down from the right towards the left. The grass is a mix of green and yellowish-brown, suggesting it might be late summer or early autumn. In the upper left, a dense forest of green trees forms a backdrop. Below the forest, a small cluster of evergreen trees stands on the slope. To the left of the main slope, a body of water is visible, with a small wooden dock or pier extending into it. The overall scene is a natural, rural landscape.

2005 7 20





2007 7 13







1980

Environmental Emergency Services

Is developed

Chemung

Schuyler

Steuben



Environmental  
Emergency  
Services



# 501-C-3 Not for Profit

Funded by Three Counties,  
as well as Cities, Towns,  
and Villages within these  
Counties



# Three Functions

Flood Warning

Drought Detection

Chemical Hazard Technical Support



# Environmental Emergency Services

## Currently Operates

- 30 Rain Gauges
- 12 River Level Monitoring Sites
- 7 Full Climate Stations

# 1995-Two Drainage Committees Formed

- Town of Elmira
- Town of Southport
- Town of Veteran formed in 2012



















10 3:37 PM











**DOLLAR GENERAL**

WINDY HILL RD



# 1995 1/3 Program

Developed for Stream Projects  
at a Cost Share

1/3 County

1/3 Town

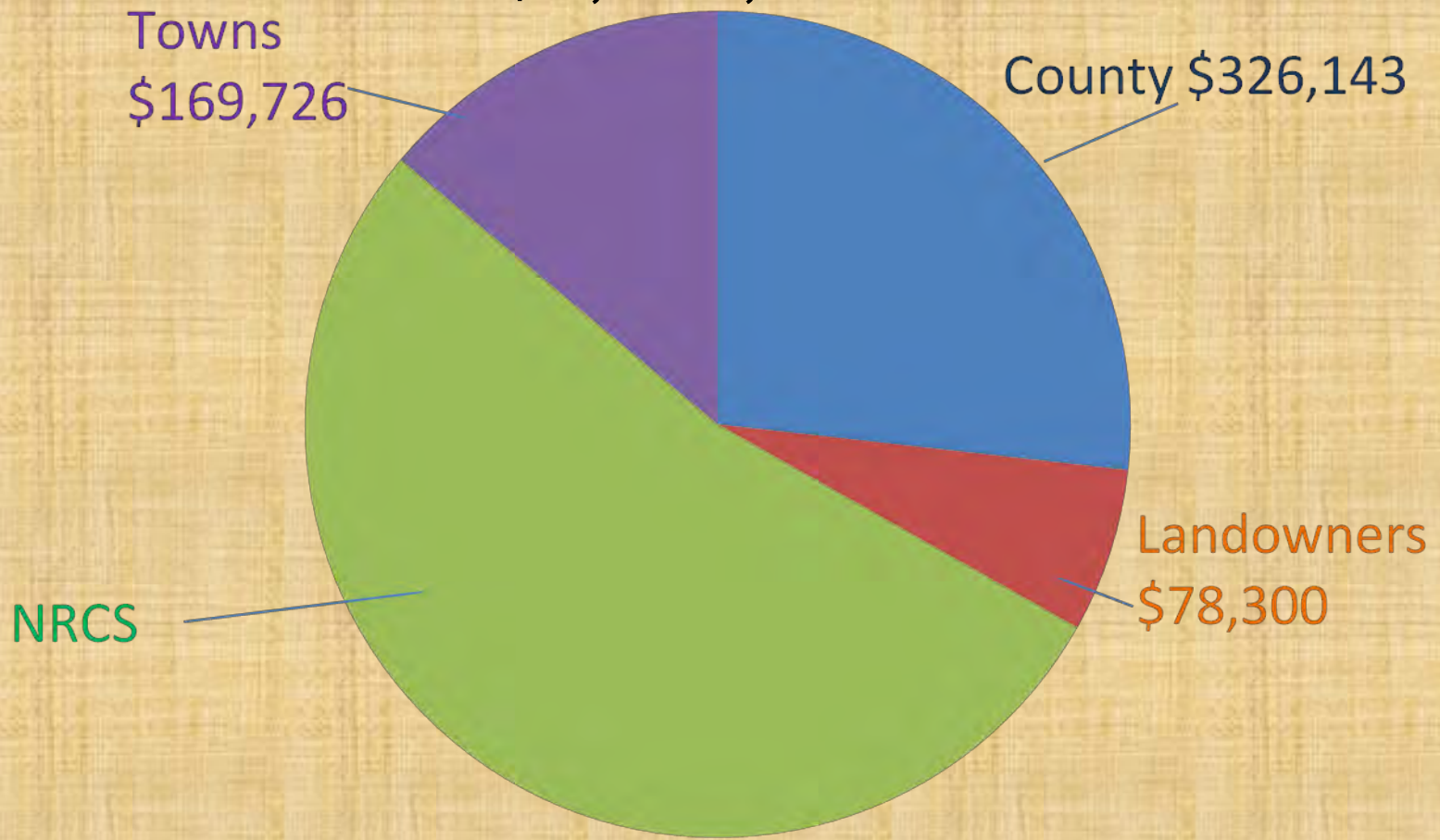
1/3 Landowner



# Chemung County Streams

## Total Expenditures as of 12/95

\$1,218,420





# 1996 Old Chemung Canal Project Phase I

Expended	\$555,000.00-Cash
	<u>\$163,000.00-In-Kind</u>
	\$718,000.00 Total























# Hardinge Inc. Detention Pond

Length	818
Width	689
Depth	7
Area	3,945,214 ft <sup>3</sup>
Gallons	29.5 million







## Phase II

Stream Work on Halderman Hollow

Total Cost \$170,000.00

Two Wetlands o Halderman Hollow

Total Cost \$40,000.00



























# Total Cost of Phase I & II

\$928,000.00

Maintenance Cost for Five  
Municipalities is around \$5-6,000.00  
per year





# 1999 House Buyout Project

- Approached sixteen (16) property owners
- Five (5) Accepted                      Eleven (11) Refused
- Paid for through Bond Act

– \$90,000.00      State  
– \$90,000.00      County





# Total Cost for:

- Five (5) Projects      \$125,000.00
- Eleven (11) Projects \$251,700.00

**–Total                      \$376,700.00**





# House Buyout-2000



13 12:00

13 12:11





FEB 10 2002





FEB 10 2002





FEB 10 2002





JAN 29 2002





JAN 30 2002















**SING-SING  
CREEK**



**SING-SING CREEK**

FLOOD PREVENTION  
RC&D MEASURE  
CHEMUNG COUNTY

**SING-SING  
CREEK**



**SULLIVAN TRAIL  
ROAD - AREA**

Environmental Assessment  
with  
Preliminary Report

U.S.D.A. - S.C.S.

March 1972

Finding of No Significant Impact  
For

Sing-Sing Creek Watershed  
& D Flood Prevention Measure

Sullivan Trail RC & D Area

Chemung County, New York

Soil Conservation Service

JULY 1972









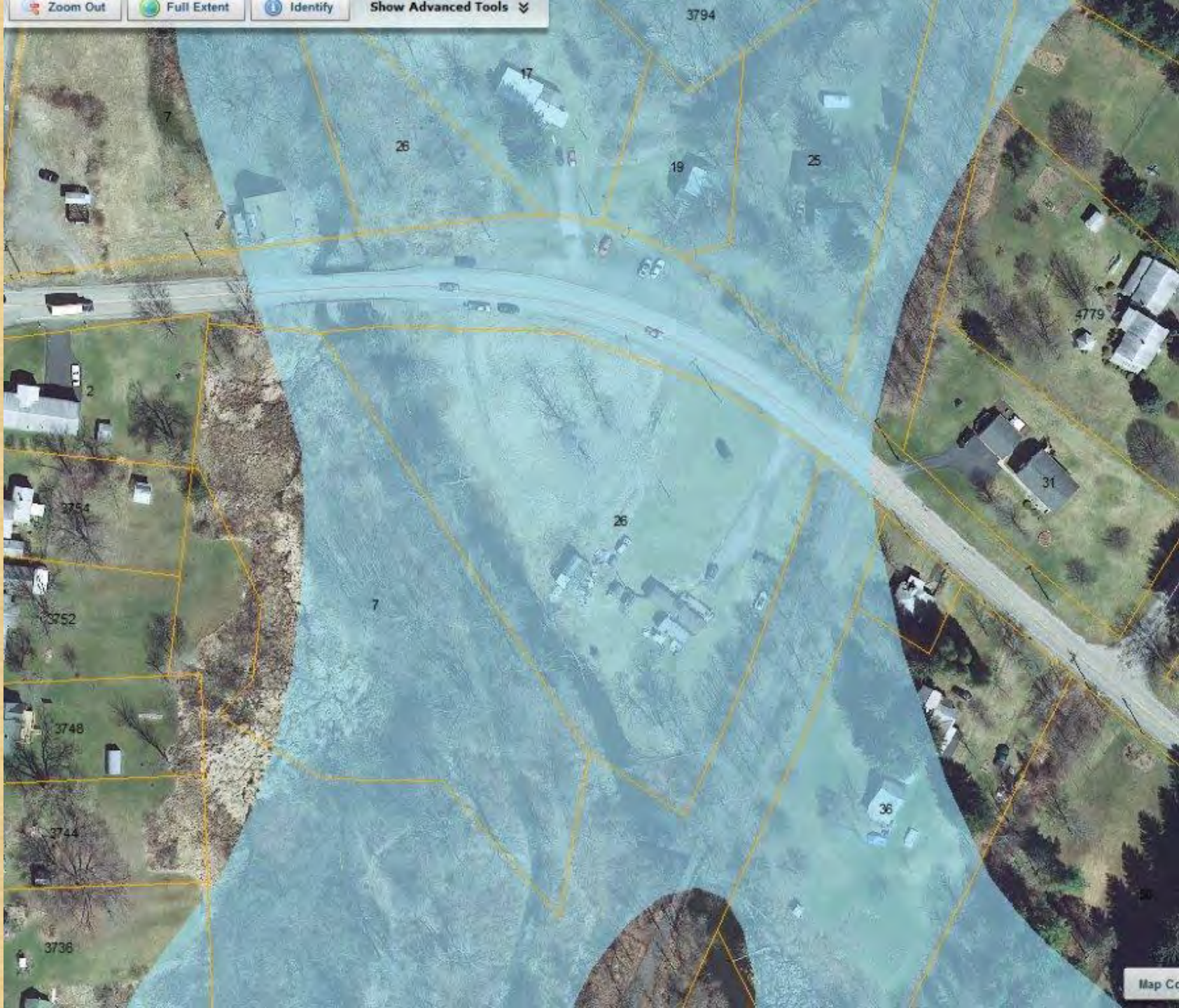


Zoom Out

Full Extent

Identify

Show Advanced Tools









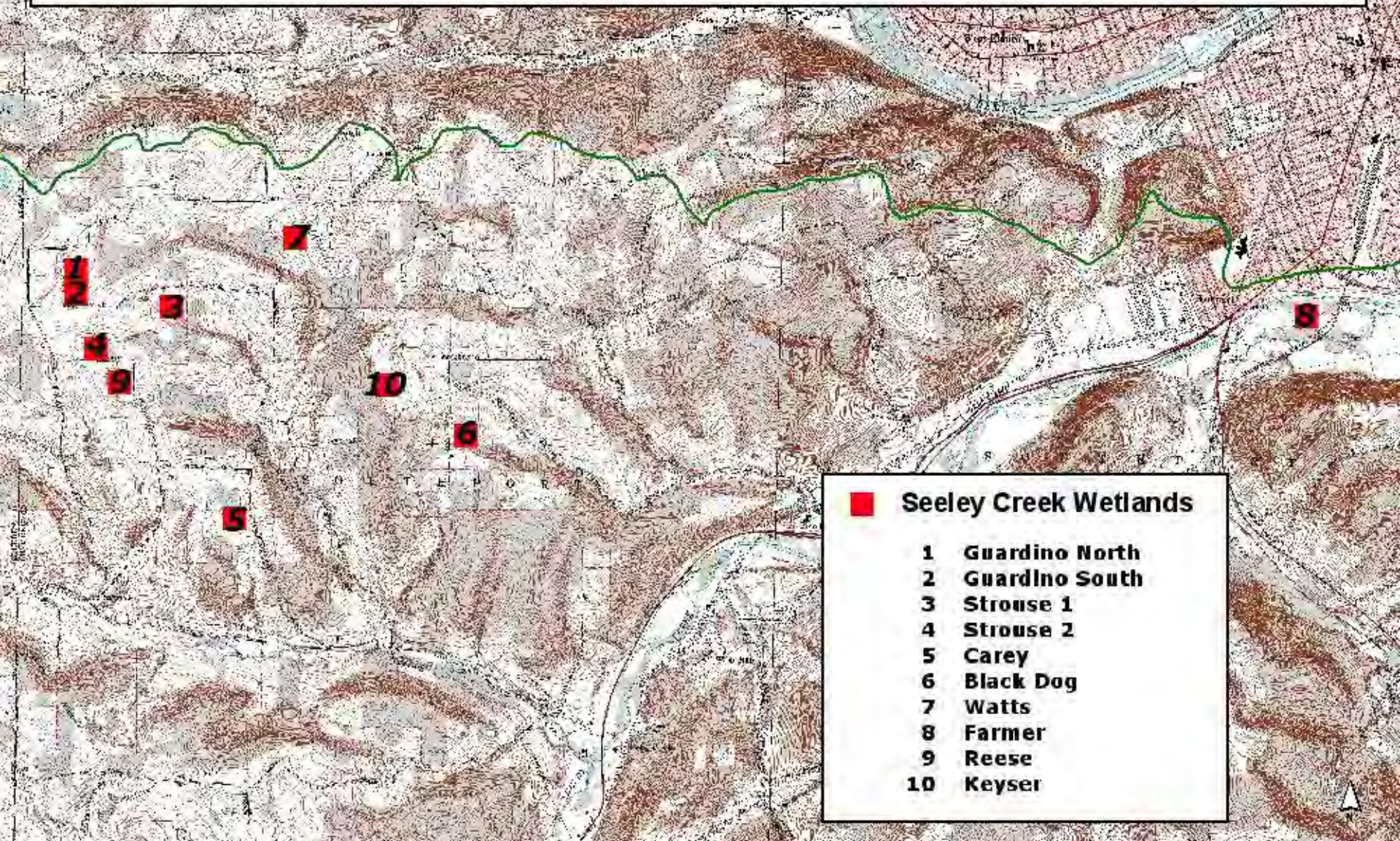








# 2000 Constructed Wetlands in the Seeley Creek Watershed













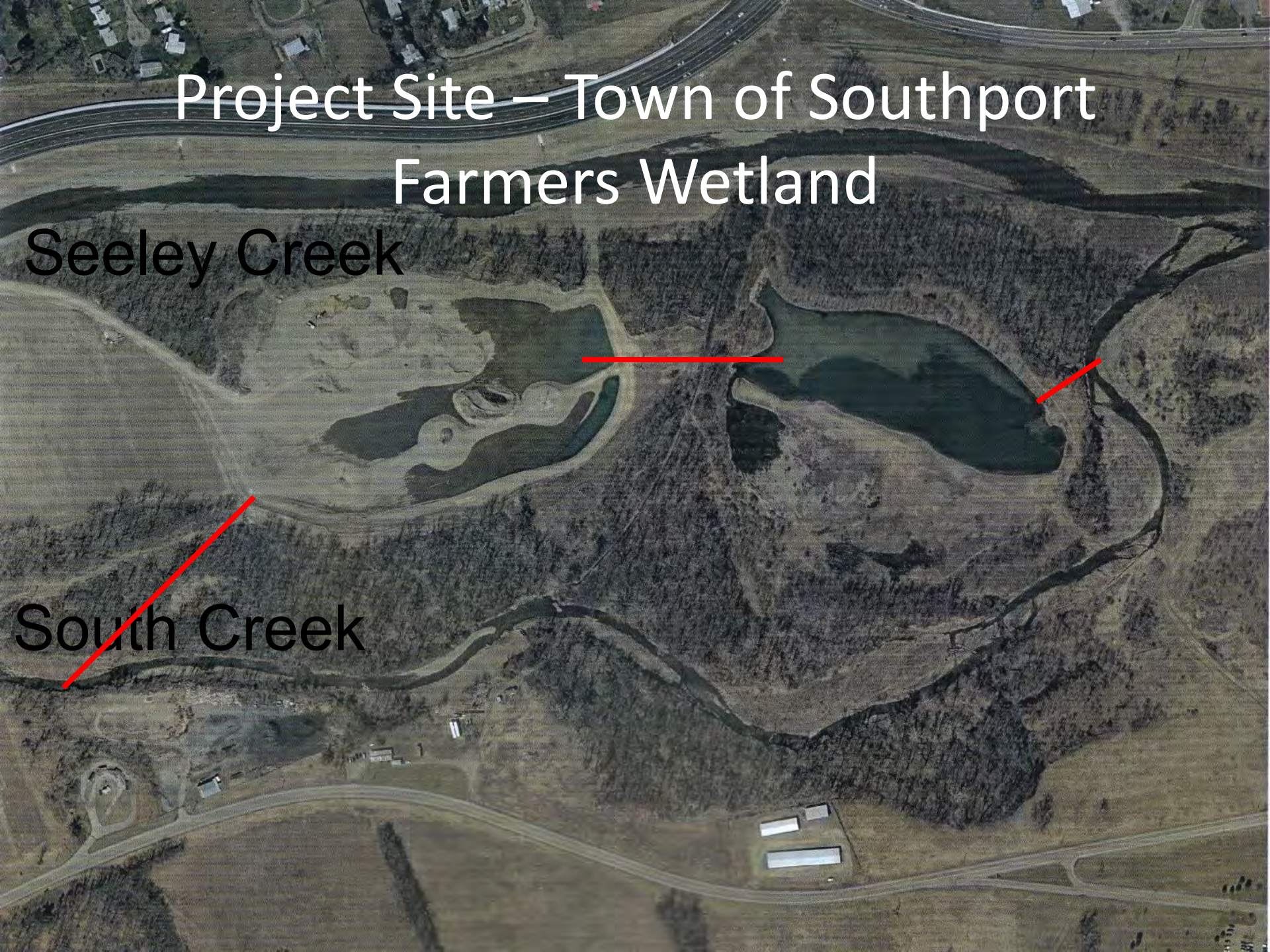




# Project Site — Town of Southport Farmers Wetland

Seeley Creek

South Creek





# Farmers Wetland –Southport



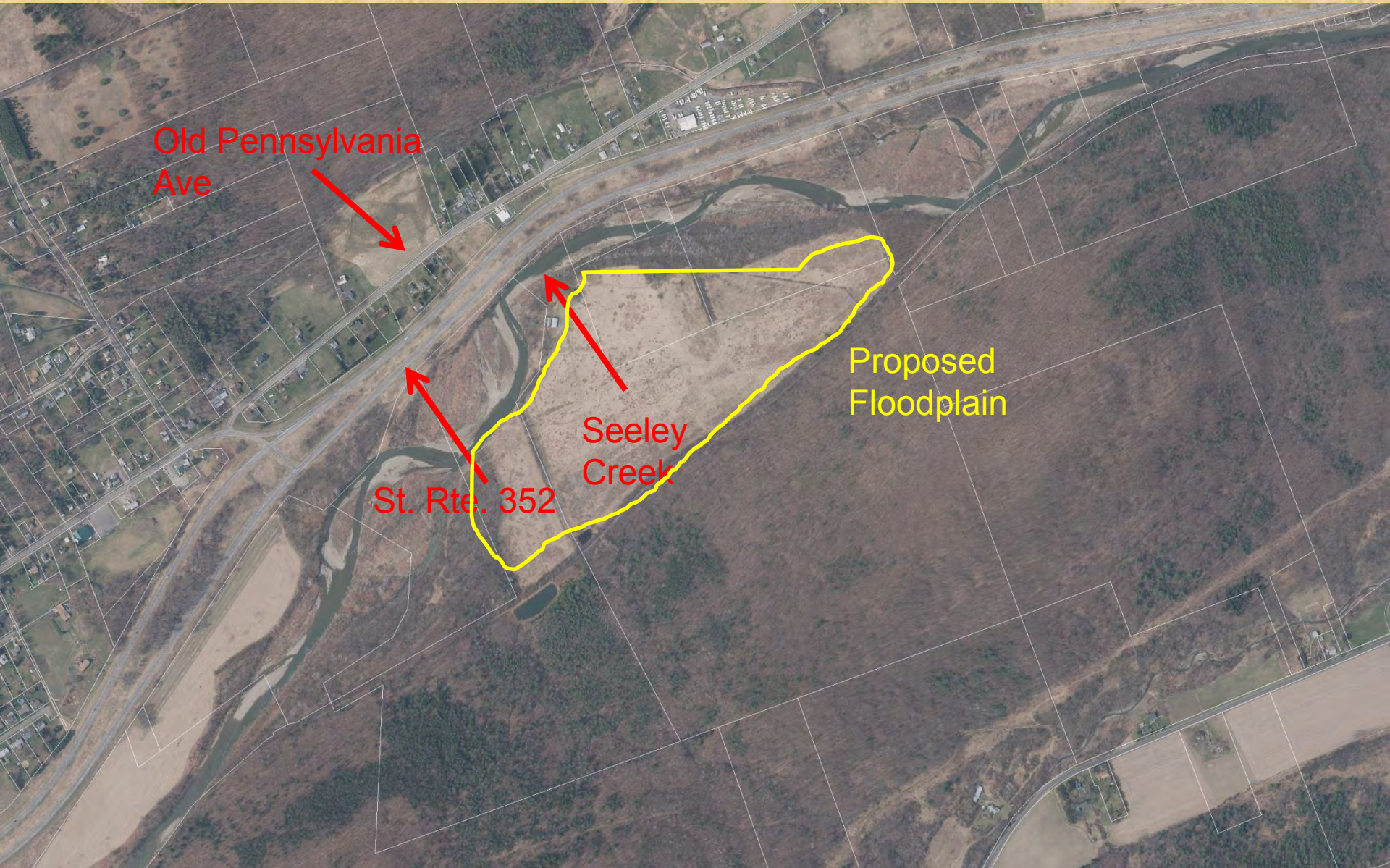


# 1938





# 2014





1995-2012

Bentley Creek Watershed Plan  
was Developed

\$5.1 million to Implement

Once constructed who will  
maintain?



## ***BENTLEY CREEK*** ***Final Watershed Project Plan –*** ***Environmental Assessment***

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***Bradford County, Pennsylvania***  
***Chemung County, New York***

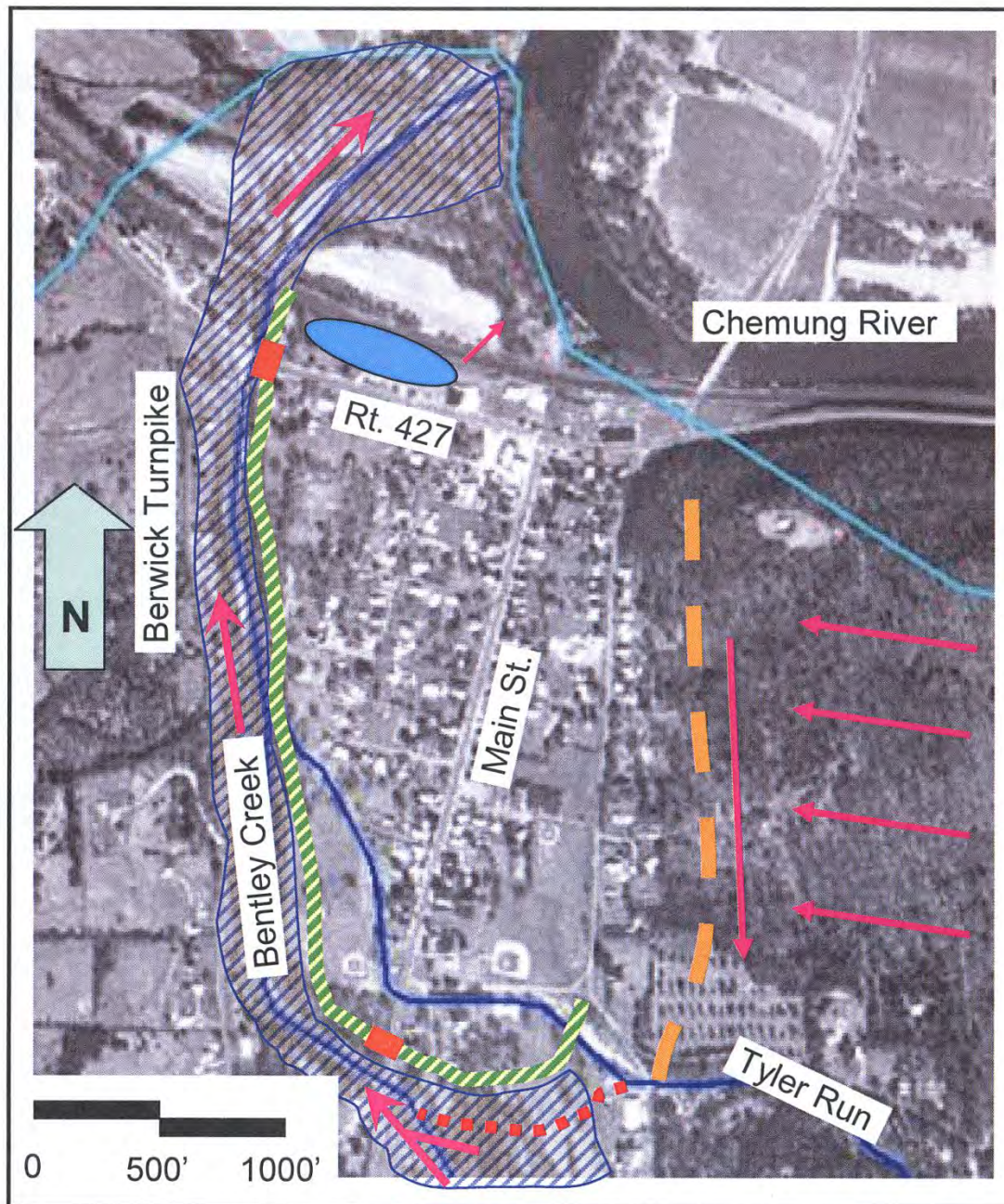


***August 2012***







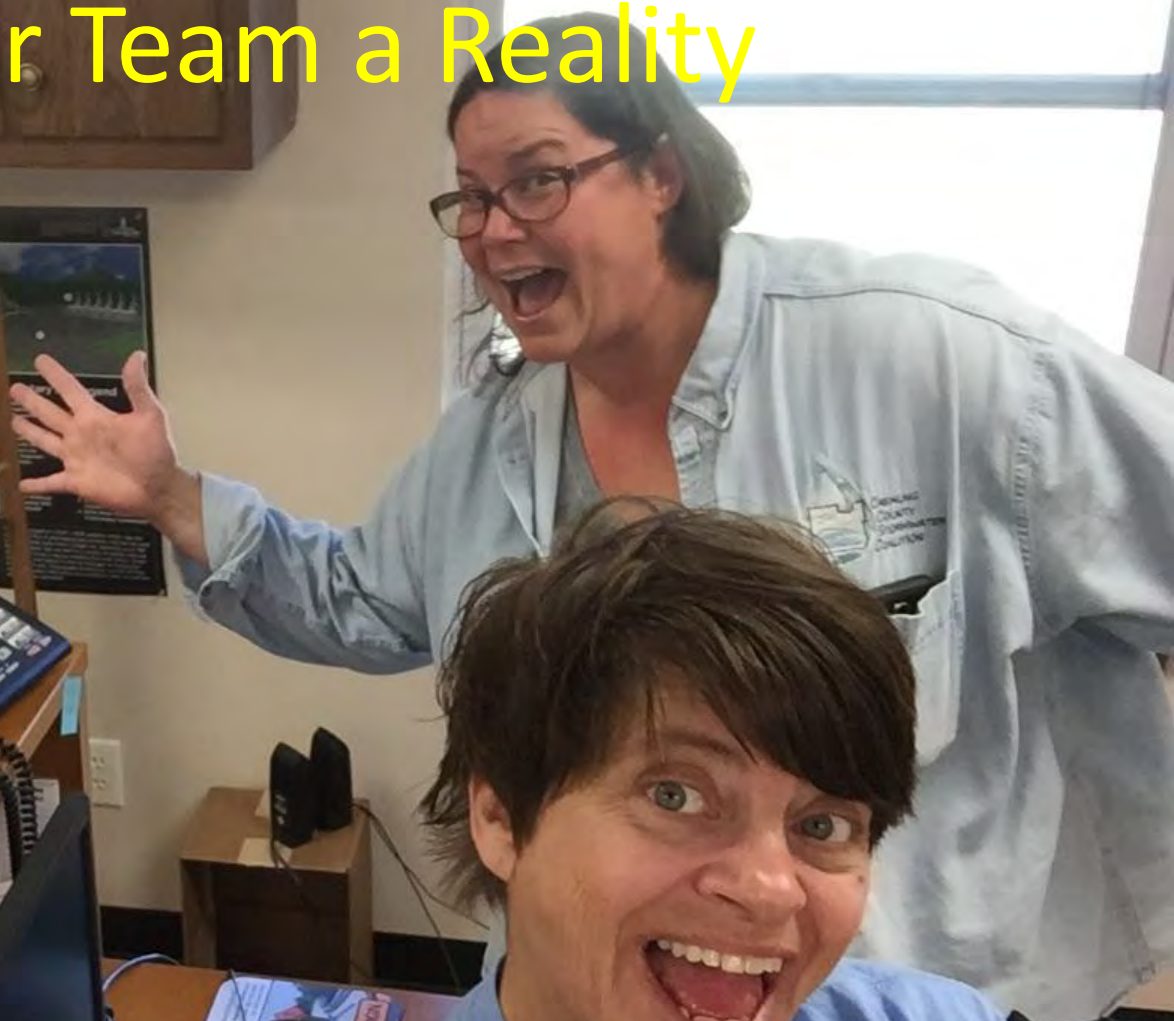


WELLSBURG DIKE



2009

# Stormwater Team a Reality





# Horseheads Dike-2010

Built in 1944 by the War Department  
Approx. 4,000' in length





























# 2012 –Stream Equipment

































# **Emergency Stream Intervention Training Day #2 Chemung/Schuyler County September 24<sup>th</sup> 2013**







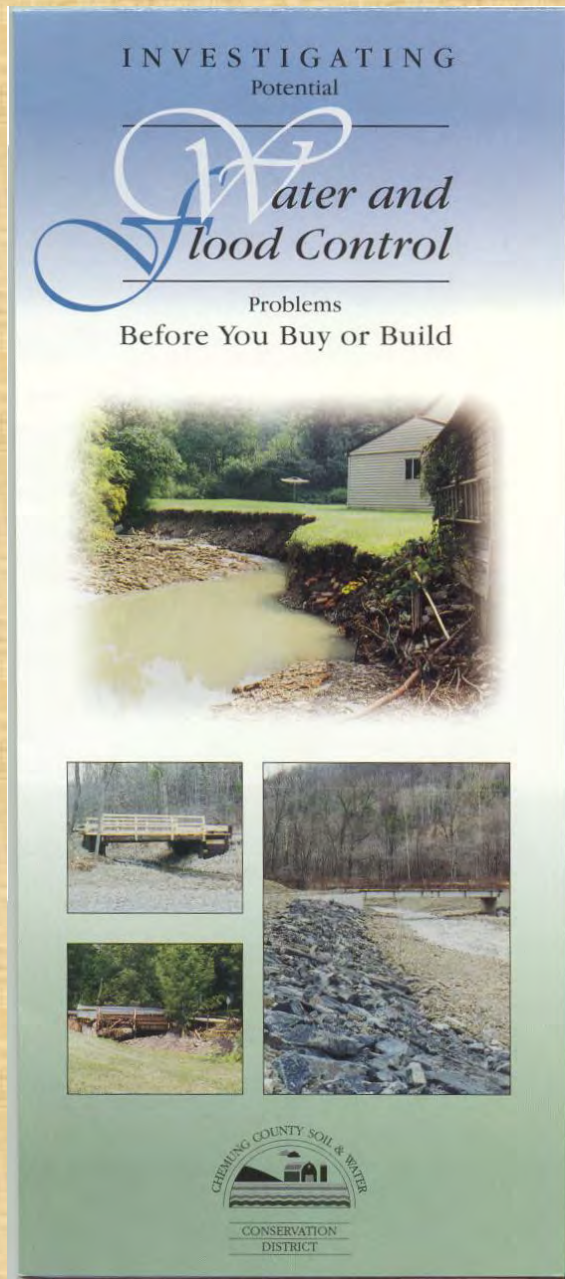
CHEMUNG COUNTY SOIL & WATER CONSERVATION DISTRICT

## **Stream Processes**

A Guide to Living  
In Harmony with Streams







# EDUCATION TOOL DISCUSSES

*f* Stream Crossings

*f* Watertables

*f* Evaluate Soil Types

*f* Sources to find information

*f* Give the person the tools & resources to make an informed decision





# Stormwater Team

## EmRiver

## NYS Fair

EmRiver  
PROCESS SIMULATORS  
www.emriver.com

New York State Fair

DIVISION OF  
**Milk Control and Dairy Services**

The Division of Milk Control and Dairy Services is responsible for all of the State's dairy industry. The Division has a dual role to protect the health and welfare of the people of New York State and to help promote the agricultural economic development of the dairy industry through various economic controls and programs.

- Enforcement of Milk Sanitation Regulations
- Licensing of Dairy Plant Operators, Supervisors, and Distributors
- Licensing of Certified Milk Inspectors
- Licensing of Milk Haulers and Samplers









# Community Benefits

- Phase I
  - The community will get a scientifically based picture of the effects of flooding and what factors are contributing to the flood risks
  - Solutions are based on *the most up-to-date information*:
    - Current stream condition*
    - Changes in precipitation*
    - The relative sustainability of different solutions*
  - Eligibility for grant programs for implementation
- Phase II
  - Better understanding of feasibility and effects of project implementation
  - Increased opportunities for funding sources
  - Increased Public Safety
  - Cost Effective sustainable solutions













SOURCE(S):

BMG  
MME HPC/AS



**Figure 4-10: SHORT TERM A  
COMBINATION OF ALTERNATIVES**

MSD: Y:\197-02\Map\Report\Figures\4-10\_ShortTermA.mxd

**LOCAL FLOOD ANALYSIS  
WEST BRANCH DELAWARE RIVER**

LOCATION: WALTON, DELAWARE COUNTY, NY

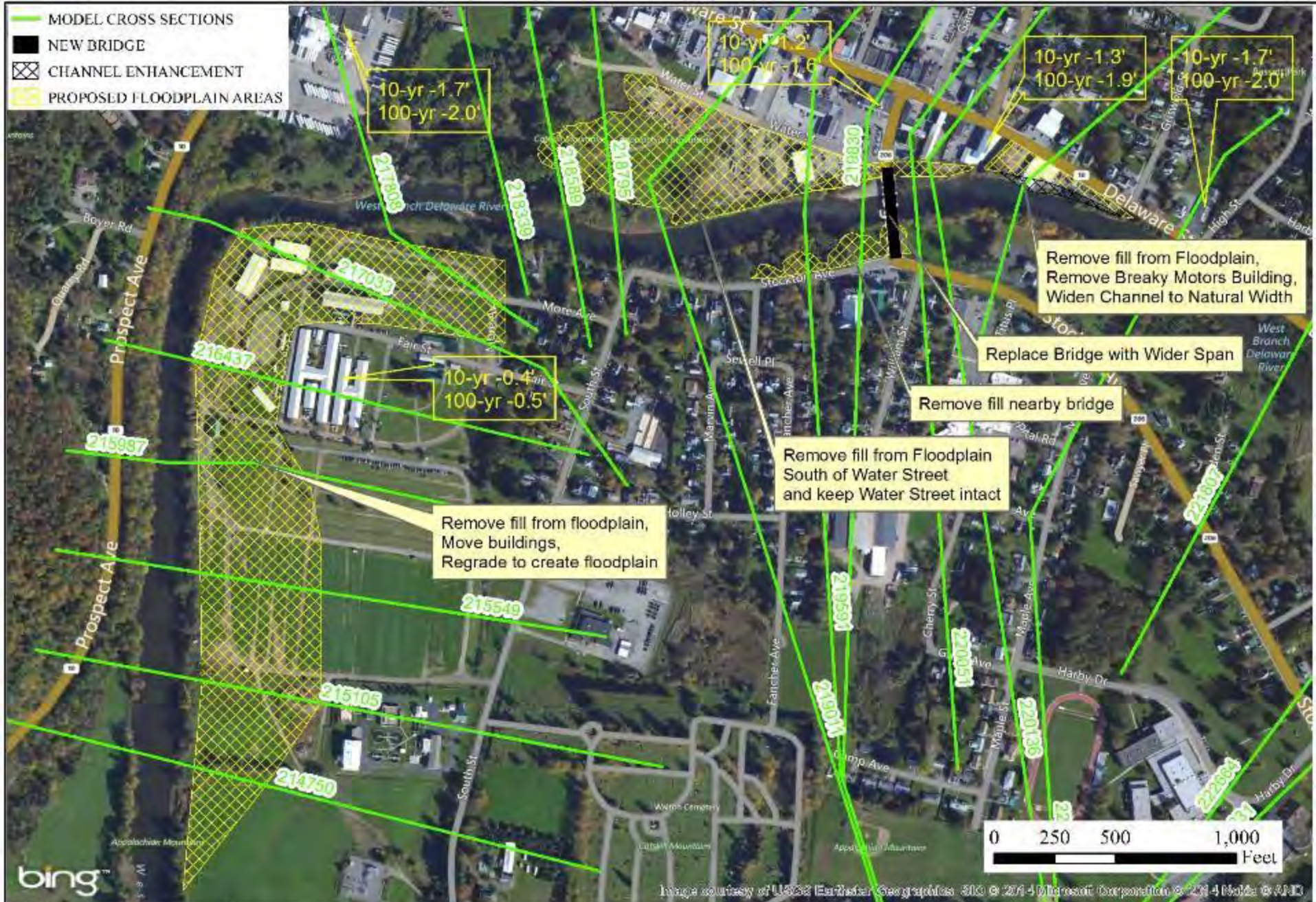
Map By: JCL  
 MME: 5197-02  
 Original: 3/15/2015  
 Revision:  
 Scale: 1 in = 290 ft

**MILONE & MACBROOM**  
 99 Realty Drive Cheshire, CT 06410  
 (203) 271-1773 Fax: (203) 272-9733  
[www.miloneandmacbroom.com](http://www.miloneandmacbroom.com)









<p><b>SOURCE(S):</b></p> <p>BING MMI HECRAS</p>	<p><b>Figure 4-13: LONG TERM C COMBINATION OF ALTERNATIVES</b></p> <p>UNXTD Y:\1197-07\Voice\Report\Floods4-13-LowTernC.mxd</p>	<p><b>LOCAL FLOOD ANALYSIS WEST BRANCH DELAWARE RIVER</b></p> <p><b>LOCATION: WALTON, DELAWARE COUNTY, NY</b></p>	<p><b>Map By:</b> JCL  <b>MMI#:</b> 5197-02  <b>Original:</b> 1/14/2015  <b>Revision:</b>  <b>Scale:</b> 1 in = 513 ft</p>	<p><b>MITLONE &amp; MACBROOM</b>  99 Realty Drive Cheshire, CT 06410  (203) 271-1773 Fax: (203) 272-9733  <a href="http://www.miloneandmacbroom.com">www.miloneandmacbroom.com</a></p>
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# County Declares a “Flood Awareness Month”

- Media stories
- Turn around don't drown
- Get into schools
- Flood insurance workshops
- Municipalities review floodplain regulations
- Municipalities review mitigation plans  
(emergency action plans)
- Discuss precautions folks can take during a flood



# Develop a mobile educational Trailer on Flooding





**WIN LOTTO!** BY DISCOVERING THE  
LUCKIEST HOURS  
OF YOUR LIFE



**Sun**  
\$1.39/\$1.59 Canada May 4, 1999  
e-mail: suntab@aol.com

**Shocking Bible warnings  
confirmed by global  
weather scientists**



# THE GREAT FLOODS TO COME!

**WORST IN  
100 YEARS**



- Raging rivers pour into inland cities
- Giant tidal waves smash all coasts



- Deadly plagues unleashed
- What you need to do to survive **PLUS** more

\$1.39 / \$1.59 Canada



Any  
Questions  
?