NYS Roadside Stormwater Management

Successes and Challenges

Dave Wick, CPESC

Executive Director

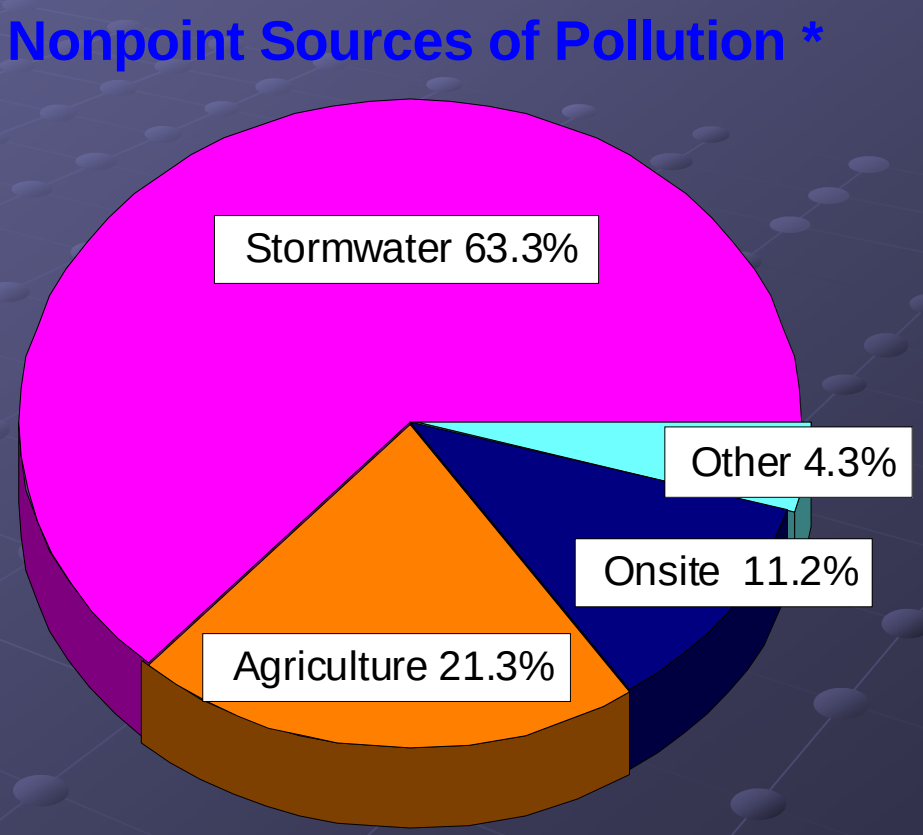
NYS Lake George Park Commission

October 9, 2014

Chesapeake Watershed Conference

Stormwater Runoff: NY State's Largest Water Quality Issue

- The state's list of impaired waters identifies stormwater runoff as the primary source of pollutants for:
  - 95% of the shellfish impacted waters
  - 51% of the waters requiring a restoration plan



•Excluding Atmospheric Deposition, Contaminated Sediments
• and Migratory Species

Road Ditching Practices

- “Eroding road ditches are the source of some of the largest water quality impacts to New York’s lakes, streams and fisheries”

  - Dr. Rebecca Schneider, Cornell University

How Can We Do Better?

Change the Standard Model:
Add Roadside Erosion Control

- Hydroseeding roadside ditches after cleanout re-establishes vegetation and stabilizes the ditches.
- Prevents thousands of tons of sediment from entering lakes and streams.

Strength of Partnerships

- Soil and Water Conservation Districts and Highway Departments
- 25 out of 58 SWCD's in NY have roadside erosion control programs
- Up from a handful in late 1990's

Local Roadside Erosion Control Programs

- Warren County SWCD Hydroseeding Program stabilizes roadside ditches following cleanout operations.
- Significant reductions in sediment loading to streams and lakes
- Over 15 miles of roadside ditch hydroseeded and re-vegetated in 2013

Outcome?

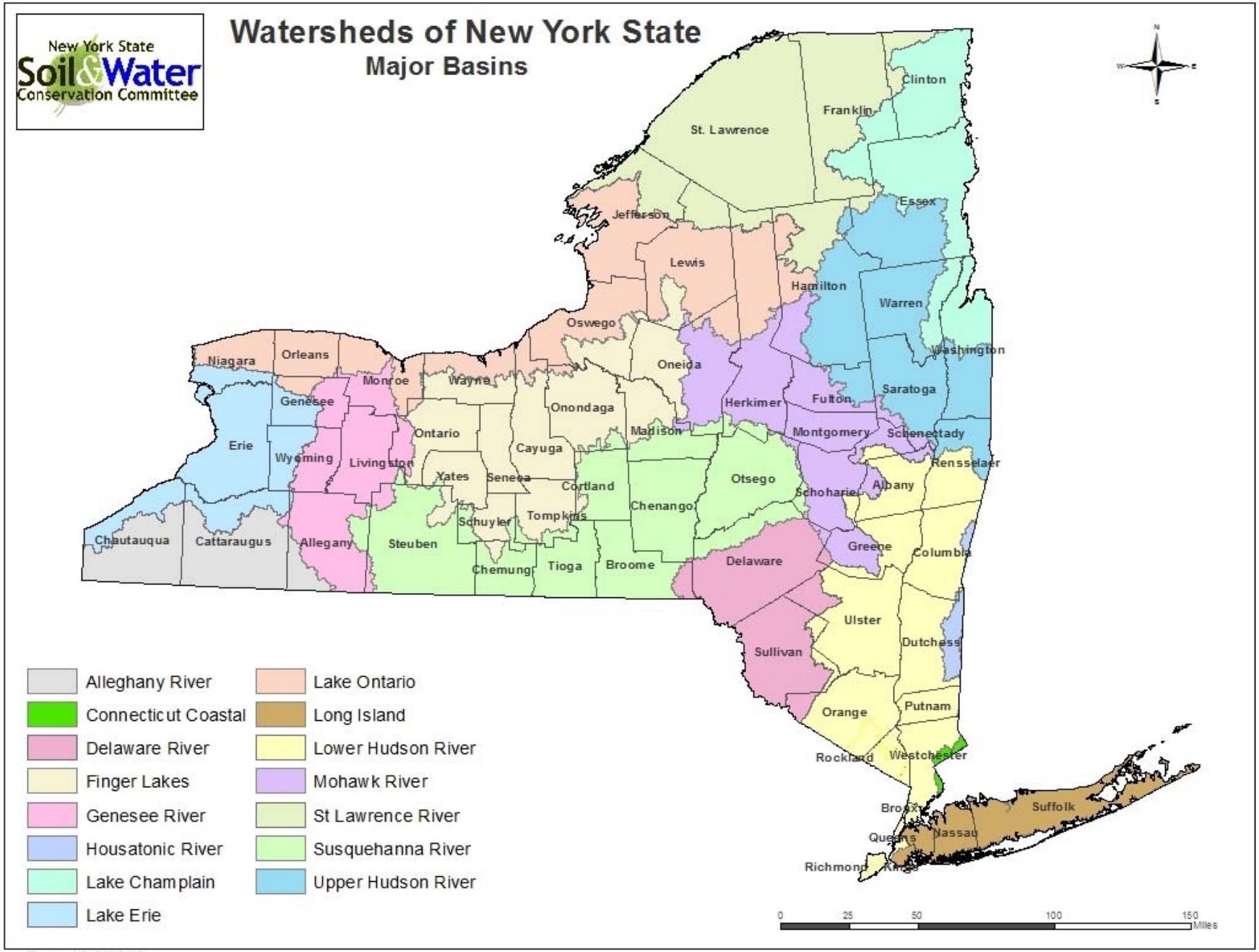
Vastly reduced erosion from sites, resulting in substantially reduced sedimentation and turbidity of receiving waterbodies

Highways and Water Quality

How Highway Departments Are Major Players in Protecting and Improving our Natural Resources

Presentation to the Town of Chester Highway Department

By Warren County SWCD, April 19, 2011



Date: 10/8/2014

Watershed Coalitions

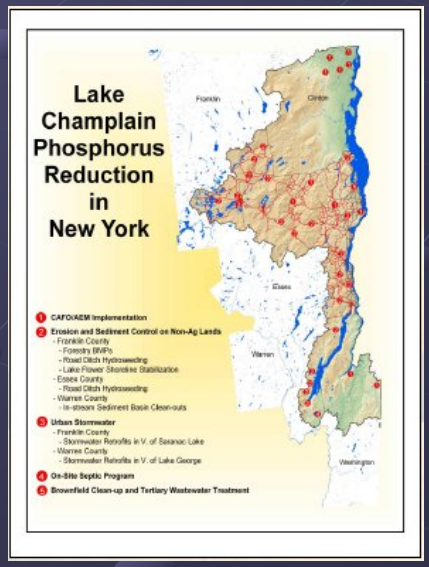
Strength in Numbers…

FLLOWPA
FINGER LAKES - LAKE ONTARIO WATERSHED PROTECTION ALLIANCE

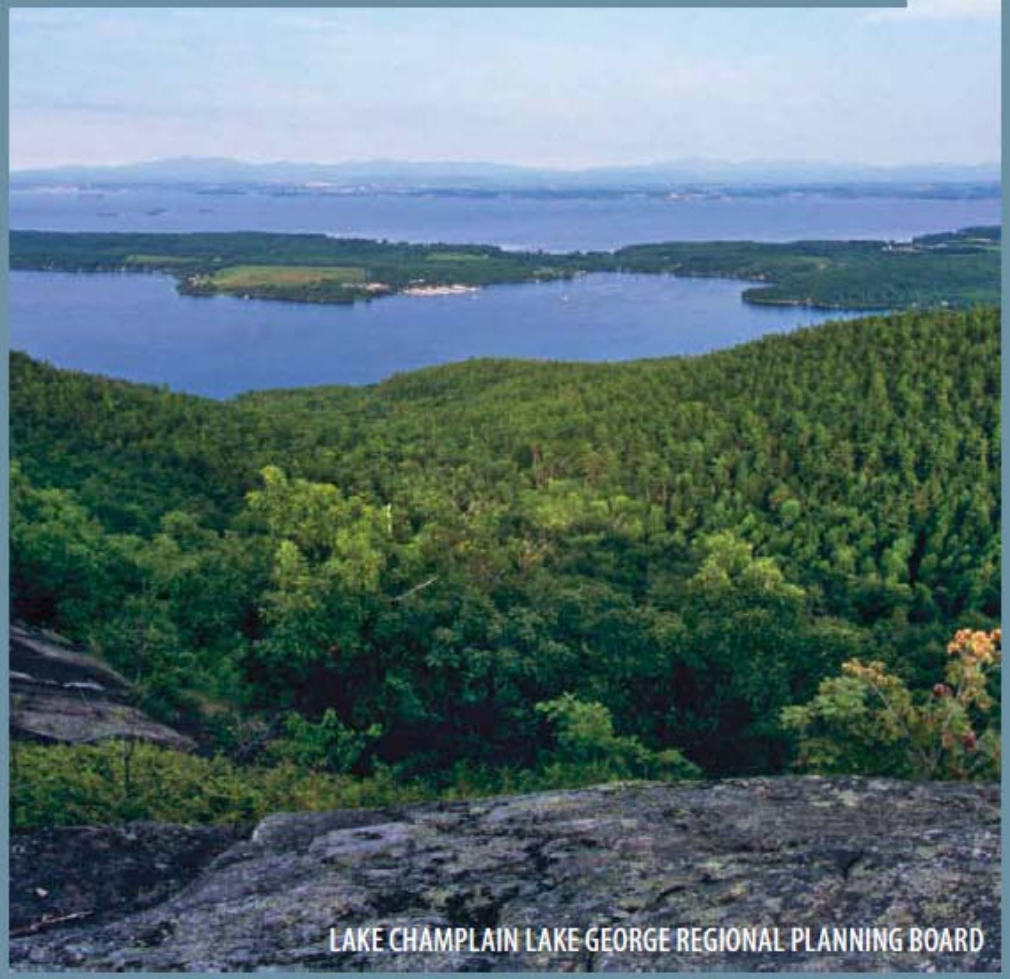
CHAMPLAIN WATERSHED
IMPROVEMENT COALITION OF NEW YORK

MRWC
MOHAWK RIVER WATERSHED COALITION

- Watershed Coalitions have been extremely effective at generating federal and state funding through a cooperative approach.



LAKE CHAMPLAIN WATERSHED
WATER QUALITY MANAGEMENT PLANNING
ROADSIDE EROSION ASSESSMENT AND INVENTORY



LAKE CHAMPLAIN LAKE GEORGE REGIONAL PLANNING BOARD

AMERICAN RECOVERY AND REINVESTMENT CLEAN WATER ACT, SECTION 604 (b) GRANT

RECOVERY.GOV

This project has been funded by the American Recovery and Reinvestment Act with support from the New York State Department of Environmental Conservation and New York State Economic Recovery and Reinvestment Cabinet. For more information, please visit www.recovery.gov, www.dec.ny.gov or www.recovery.ny.gov

NYWORKS

AWARDED TO

LAKE CHAMPLAIN - LAKE GEORGE REGIONAL PLANNING BOARD
1 AMHERST STREET, PO BOX 765, LAKE GEORGE, NEW YORK 12845
WALTER YOUNG, DIRECTOR

IN PARTNERSHIP WITH

The Champlain Watershed Improvement Coalition of New York
Beth Gilles, President; Andrew Snell, Coordinator

INCLUDING

Clinton County Soil and Water Conservation District
Steve Mahoney, District Manager

Essex County Soil and Water Conservation District
David Reckahn, District Manager

Franklin County Soil and Water Conservation District
Chastity Miller, District Manager

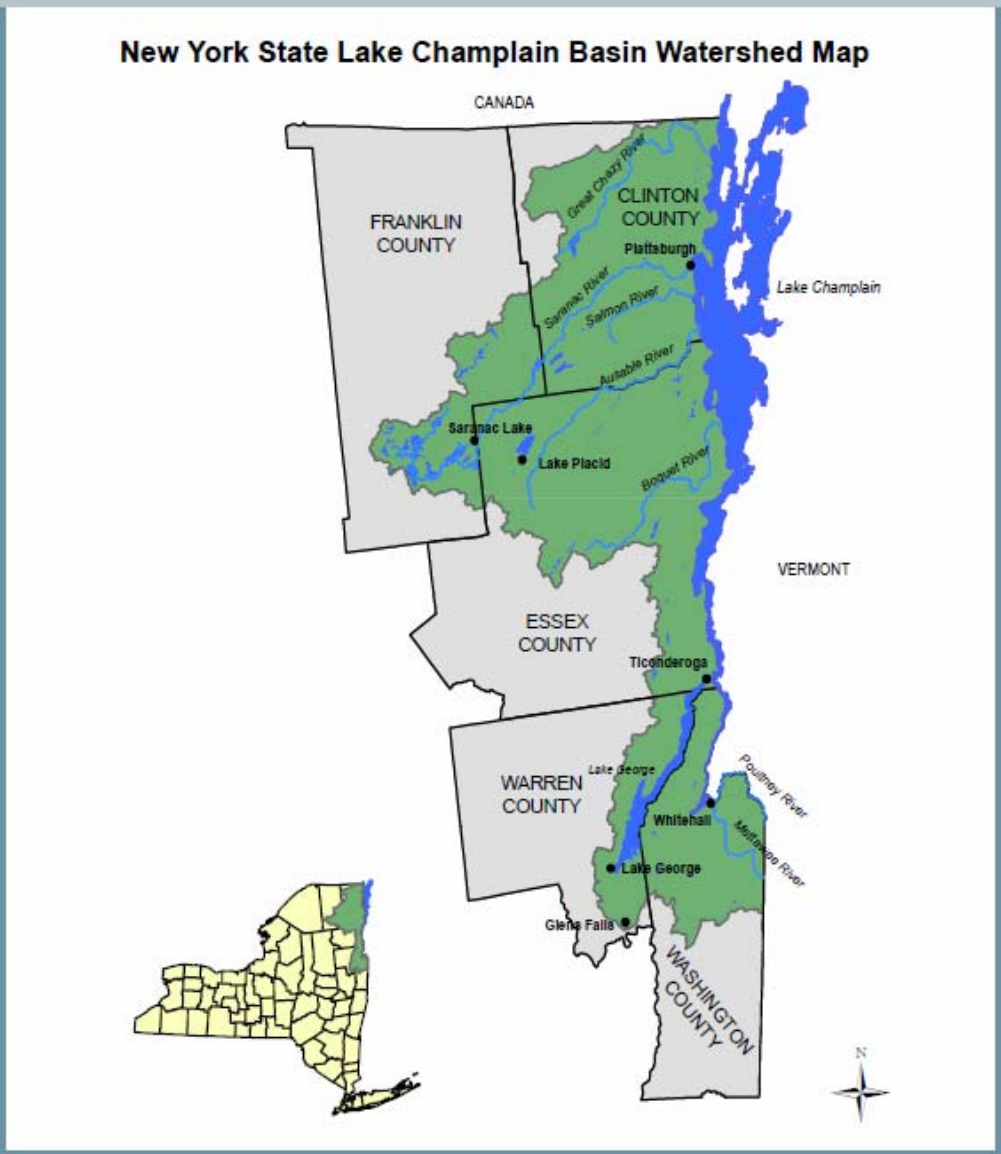
Warren County Soil and Water Conservation District
Dave Wick, District Manager

Washington County Soil and Water Conservation District
Joe Driscoll, District Manager

Cover and inside cover photograph courtesy of Carl Heilman II.

LAKE CHAMPLAIN WATERSHED

STATE AND COUNTY MAPS



Identifying the Issues…

- More than 2,500 hours of field work, mapping, research and writing by SWCD staff
- Goal was to not only identify issues, but to determine specific, practical solutions

Table 1. Data dictionary parameters used to identify roadside erosion sites.

PARAMETER	MENU SELECTIONS
Road Type	Divided Highway; Multi-lane Highway; Two-lane Paved; Other Paved; Gravel; Trail; Railroad
Road Slope	Steep Grade; Flat; Moderate Grade
Jurisdiction of Road	State - DOT; State - DEC; County - Warren; County - Washington; County - Essex; County - Clinton; County - Franklin; Town; Village; Private
Man Made Structure	Bridge; Culvert
Structure Condition	Good - only minor; Fair - deteriorating; Poor - failing
Outlet of Structure	Into River; Into Ditch; Into a Wetland; Into a Lake; N/A
Structure Undermind	No; Yes - Headwall; Yes - Culvert; Yes - Pier; Yes - Corrosion
Vegetation Present	Grasses; Invasive Plants; Woody Shrubs; Mature Trees; None; Other
Percent of Vegetation	0 - 100%
Site Eroding	Ditch, Road Bank; Stream Bank; Hillside; Culvert Outlet
Jurisdiction of Erosion	Private; State Right of Way; County; Town; Unknown
Erosion Evident	Past Erosion; Continuous Erosion
Cause of Erosion	Excess Velocity; Channelization; Natural Causes; Surface Runoff; Other
Erosion Active	Yes; No
Stability of Area	Extremely Unstable; Needs Future Assistance; Stabilizing Naturally
Size of Area	0.1 - 0.25 acres; 0.25 - 0.50 acres; 0.5 - 0.75 acres; 0.75 - 1.0 acres; 1.0 acres+
Soil Type	Use soil texture triangle
Soil Test Done	Yes; No
Management Required	Hydroseeding; Rock Armour; Soil Remediation; Bio-Engineering; None; Other
Resolvability	Simple; Moderate; Difficult

Other data entry text files include watershed, name of waterbody, date, time, town, USGS Quad,field crew, closest intersection, road name and distance to waterbody, measured in feet.

Criteria for slope and level of erodibility were recorded in the field according to the following criteria:

Slope	**Steep**	>2:1 or undercut
	Moderate	2:1
	Low	3:1
Level of Erodibility	**High**	Bare loose soil / actively slumping / steep or undercut
	Moderate	Semi-vegetated / some slumping evident / moderate slope
	Low	High percentage of vegetation / soil is not actively slumping / low slope

SITE PRIORITIZATION

ROADSIDE EROSION ASSESSMENT AND INVENTORY

A scored ranking system was created in order to analyze the data collected and place proper emphasis on the critical areas. This system ranks the order of the sites from high (critical) to low (non-critical) based on a numerical score calculated from selected criteria in Table 1. To keep the matrix usable, five parameters were chosen based on the direct connection to erosive processes;

1. Direct Connection or Proximity to Stream - This criteria was chosen for the direct loading of sediment into a waterbody.
2. Percent Vegetation - The fewer plant roots holding soil in place the more erosion occurs.
3. Level of Erodibility - Indicative of whether slumping is actively occurring at the site.
4. Bank Slope - Slope steepness increases the amount of soil lost during erosion.
5. Width x Length - The more surface area exposed the more soil is lost.

The rankings of High, Moderate and Low were given a scoring range based on the Total Score calculated in Table 2, which has a maximum of 60 points. Each individual site was then ranked.

Ranking	Score
High	40 - 60
Moderate	31 - 39
Low	0 - 30

A general description of each ranking was then produced based on the attributes calculated in Table 2.

High	bare soil, steep bank, highly erodible material, possibly a direct connection to water body, large square footage; needs immediate maintenance either vegetative or structural.
Moderate	semi-vegetated bank, moderate slope, moderately erodible, no direct connection to water body, medium square footage; site can likely be remediated with vegetation.
Low	mostly vegetated, low slope, not highly erodible, small amount of square footage; may recover without maintenance, vegetation would help recovery.

Table 2. Prioritization Criteria for Ranking Eroding Road Banks

CRITERIA	POINTS
Direct Connection or Proximity to Stream	10
Percent Vegetation	
0 - 25%	15
26 - 50%	10
51 - 75%	5
76 - 100%	1
Level of Erodibility	
High	10
Moderate	5
Low	1
Bank Slope	
Steep	10
Moderate	5
Gradual	1
Width x Length	
> 2000	15
1501 - 1999	10
<1500	5
Total Score	
Ranking	0 - 60

IDENTIFICATION #31

Town
Ausable

Road Name	Clintonville Road
Jurisdiction	County
Watershed	Ausable River
Direct connection to water	No
% of Vegetation	15
Bank Slope	Steep
Level of Erosion	High
Length of Erosion (ft)	75
Width of Erosion (ft)	30
Total Area of Erosion (ft^2)	2250
Soil Type	Fine Sand
Management Recommendations	Hydroseed with reclamation mix
Cost	$2500 - $3500
Total Points	50
Rank	High

IDENTIFICATION #32

Town
Ausable

Road Name	Clintonville Road
Jurisdiction	County
Watershed	Ausable River
Direct connection to water	No
% of Vegetation	15
Bank Slope	Steep
Level of Erosion	High
Length of Erosion (ft)	75
Width of Erosion (ft)	30
Total Area of Erosion (ft^2)	2250
Soil Type	Fine sand
Management Recommendations	Install sediment trap and hydroseed with reclamation mix
Cost	$1500 - $2500
Total Points	50
Rank	High

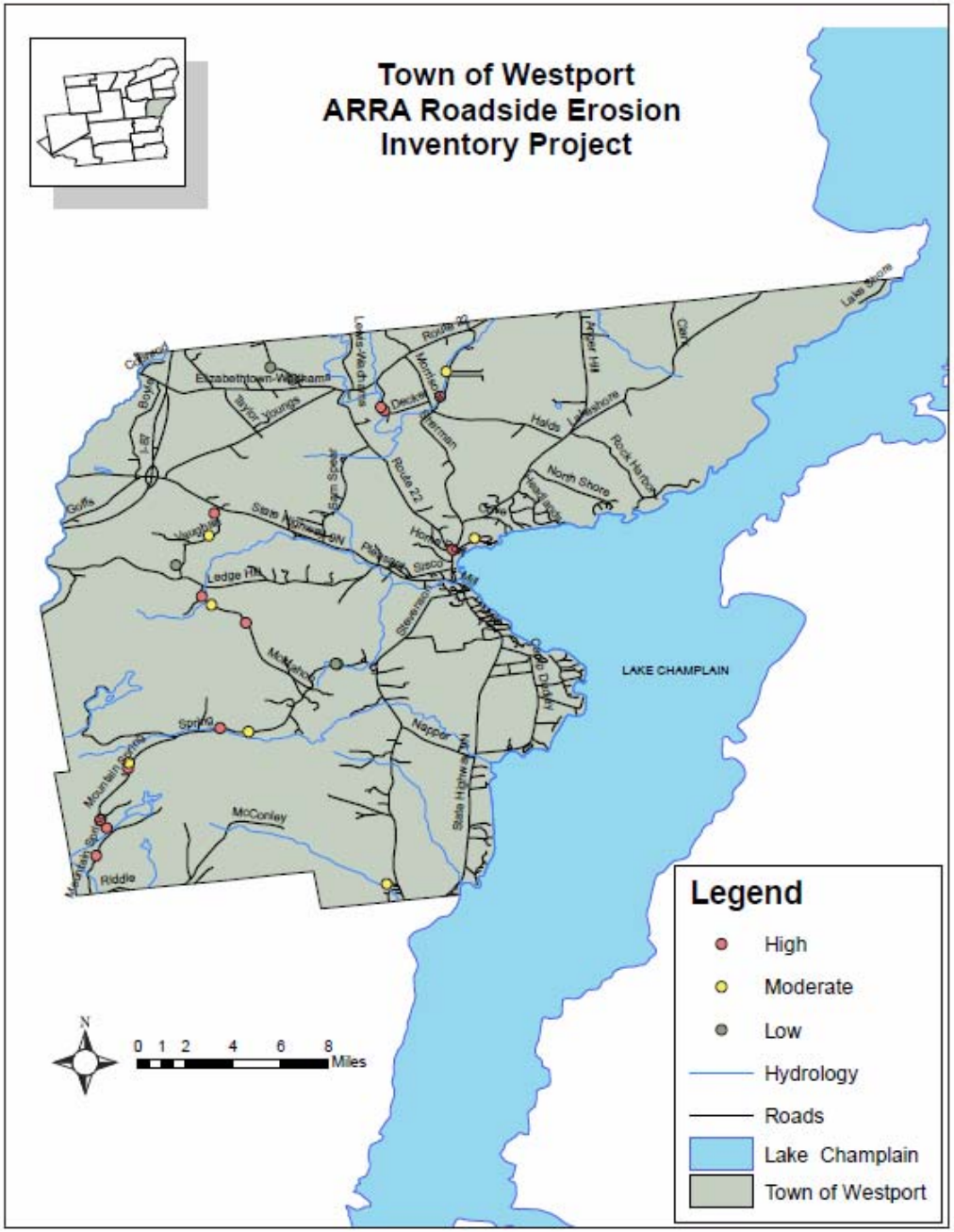

Town of Westport
ARRA Roadside Erosion
Inventory Project
LAKE CchamplaIN
Legend
High
Moderate
Low
Hydrology
Roads
Lake Champlain
Town of Westport
N
0 1 2 4 6 8
Miles

Table 3. Number of high, moderate and low priority erosion sites per county.

County	Number of Sites per Priority			Percentage of sites in Champlain Watershed	Total Restoration Costs per County
	High	Moderate	Low		
Clinton	22	6	6	11%	$91,150
Essex	50	39	42	40%	$1,443,650
Franklin	14	13	62	28%	$72,700
Warren	19	8	7	11%	$35,350
Washington	12	11	8	10%	$65,750

EDUCATION

NORTH COUNTRY STORMWATER TRADESHOW AND CONFERENCE

Although a substantial amount of funding is needed for the on-the-ground remediation of the sites found within the Champlain Basin, education also plays an important part of managing all types of pollution, including roadside erosion. If local professionals and municipal and state employees are given the knowledge to prevent erosion at the onset of a project, then the time and money needed to remediate sites will decrease. This is why the Regional Planning Board, CWICNY and the County SWCD's are committed to providing education on the most modern techniques and products in the erosion and sediment control field.

TRADESHOW AGENDA	
2009	
Opening Remarks	Assemblywoman Teresa Sayward
The Continuing Struggle for Stormwater Compliance, What's Ahead for the NYS Stormwater Program and Misconceptions of Soils in Stormwater	Don Lake, PE
BMP Solutions for Disturbed Areas	Steve Zwilling, IFCA
Flood Plain Management	William Nechaman, NYS Department of Environmental Conservation
Site Planning for Wastewater and Stormwater Management for Residential Construction	Miriam McGivor, PE, NYS Department of State
Green Roof Case Study, Albany, NY	Scott Townsend, 3T Architects
EM River Model Demo	Staci Pomaroy, VT Agency of Natural Resources
2010	
Open Remarks	Bill Wellman, Champlain Chapter, Trout Unlimited
UNH Stormwater Overview, BMP Treatment Performance and Cold Climate Practices	Dr. Tom Ballestero, PE, University of New Hampshire Stormwater Center
Design Handbook Updates and Infiltration BMP Sizing and Design Handling Climate Change Precipitation	Don Lake, PE
Porous Asphalt Case Study	Daniel Hershberg, PE, LS
2011	
Opening Remarks	Jim Tierney, NYS DEC Division of Water Assistant Commissioner
Green Infrastructure and Low Impact Development	John Dunkle, PE CPESC, Dunn & Sgromo Engineers
Detection and Elimination of Illicit Discharges to Storm Sewers	Andrew Sansone, CPSWQ, Monroe Co. Environmental Services
Phosphorus Treatment Advanced Mechanism and Design	Scott Perry, CPSWQ, Imbrium Systems
Local Stormwater Panel - Discussion of Regulatory Updates and Local Issues, Focused on the New DEC Design Manual, Chapter 5, Green Infrastructure	Carol Lamb Lafay, PE NYS Department of Environmental Conservation Suzanna Randall, Environmental Facilities Corp. Tom Baird, PE, Barton and Loguidice

Rural Roads Active Management Program

FIELD GUIDE

Champlain Watershed Improvement Coalition of New York

Lake Champlain Basin Program

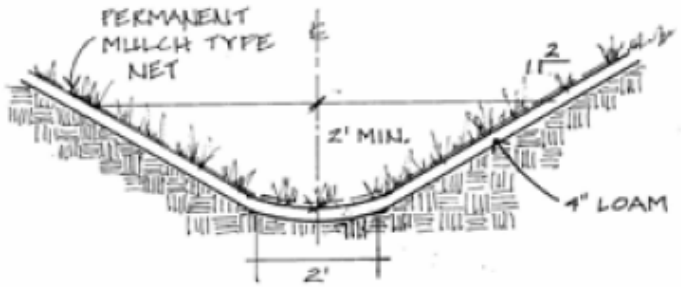
A publication of the
Champlain Watershed Improvement
Coalition of New York
394 Schroon River Road
Warrensburg
New York 12885
518-962-8225

March 2014

This manual is made possible with support from
the Lake Champlain Basin Program

Ditches

Grass: Line ditches that have less than 5% slope with grass in order to filter sediments. Use mulch or erosion control blankets to hold seed in place and allow it to become established.



GRASS LINED DITCH

Stone: Line ditches having 5% to 10% slope with stone.

- If slope is 5% to 10%, line ditches with stone 2 to 6 inches in diameter up to 7.5 inches thick.
- If slope is greater than 10%, line ditches with stone 3 to 12 inches in diameter up to 12 inches thick.
- Use geotextile fabric (nonwoven) under stone in ditches to protect against erosion of underlying soil and provide a barrier between stones and soil.

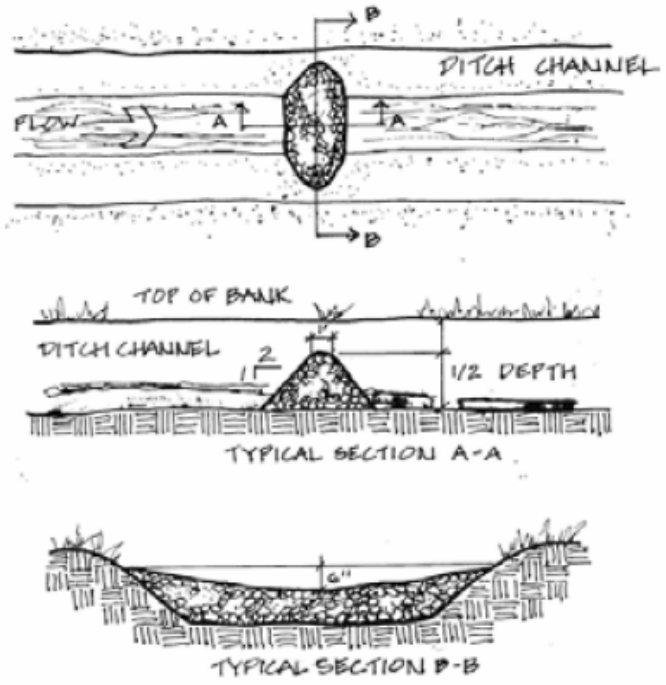
Velocity Controls and Energy Dissipaters

Locate in ditch channels and at culvert outlets to reduce scour and erosion, collect sediment, and help ground water recharge.

- Types of velocity controls and energy dissipaters include: stone dikes and log and brush check dams.

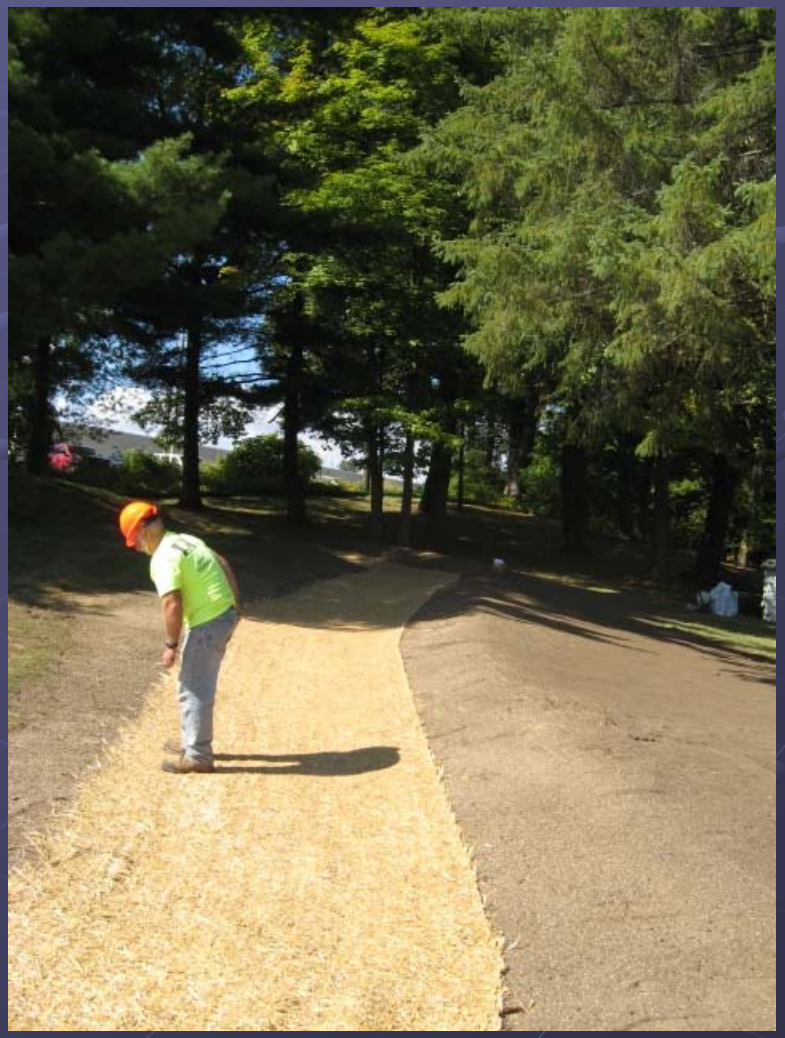
Stone Dikes

- Constructed of stone large enough to handle the expected velocity of water.
- More permanent than most other types of controls.



Making it Work…

- Understanding the importance of the issue (i.e., conferences like this!)
- Buy-in from local, county, state and federal
- Need a mechanism to get the work done on the ground (Conservation Districts/highway departments)



Thank You!

Dave Wick
Executive Director
Lake George Park Commission

Phone: 668-9347
Email: dave@lgpc.state.ny.us
Website: www.lgpc.state.ny.us

Address:
75 Fort George Road
PO Box 749
Lake George, NY 12845