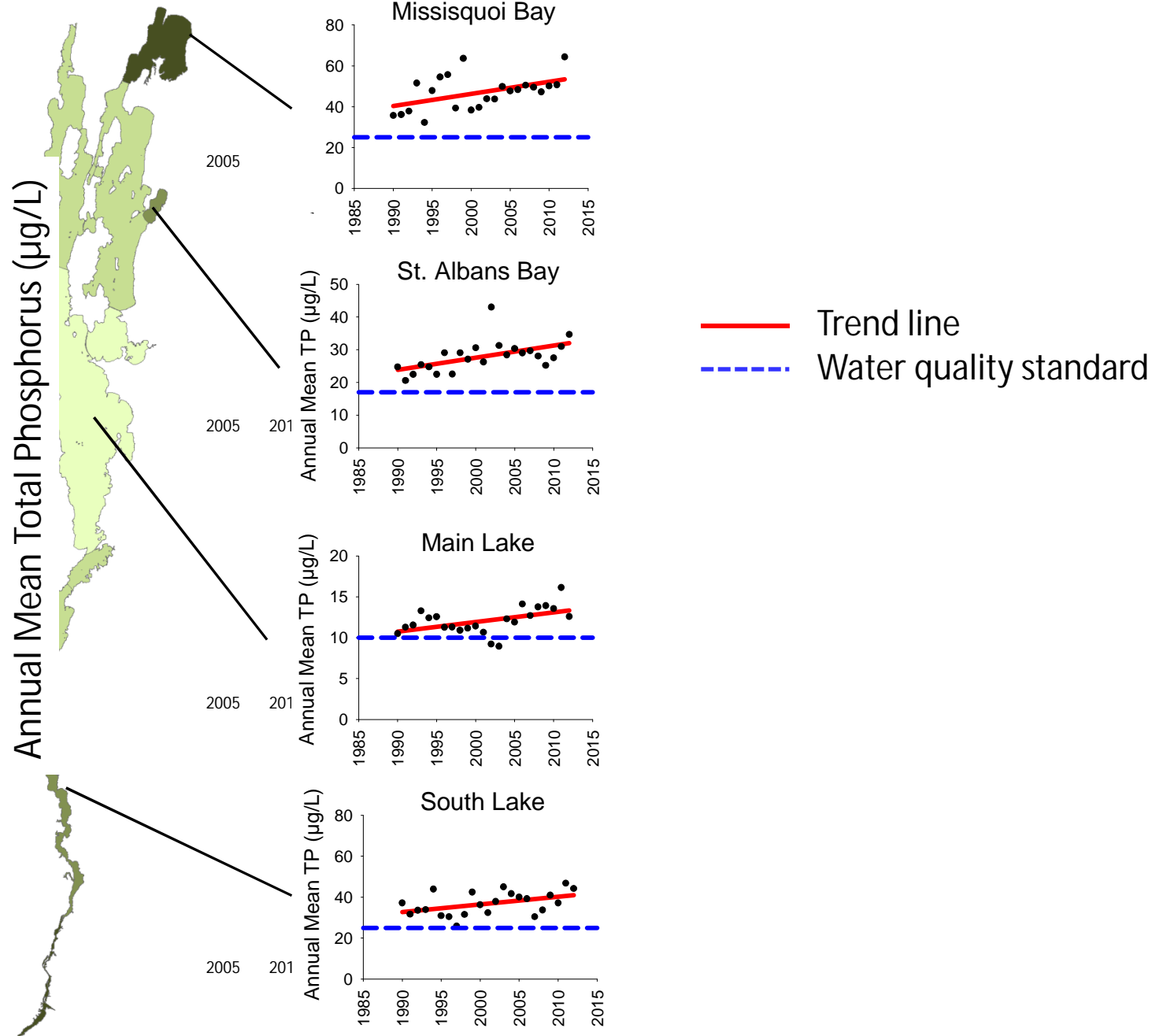


# Restoring Clean Water in Vermont

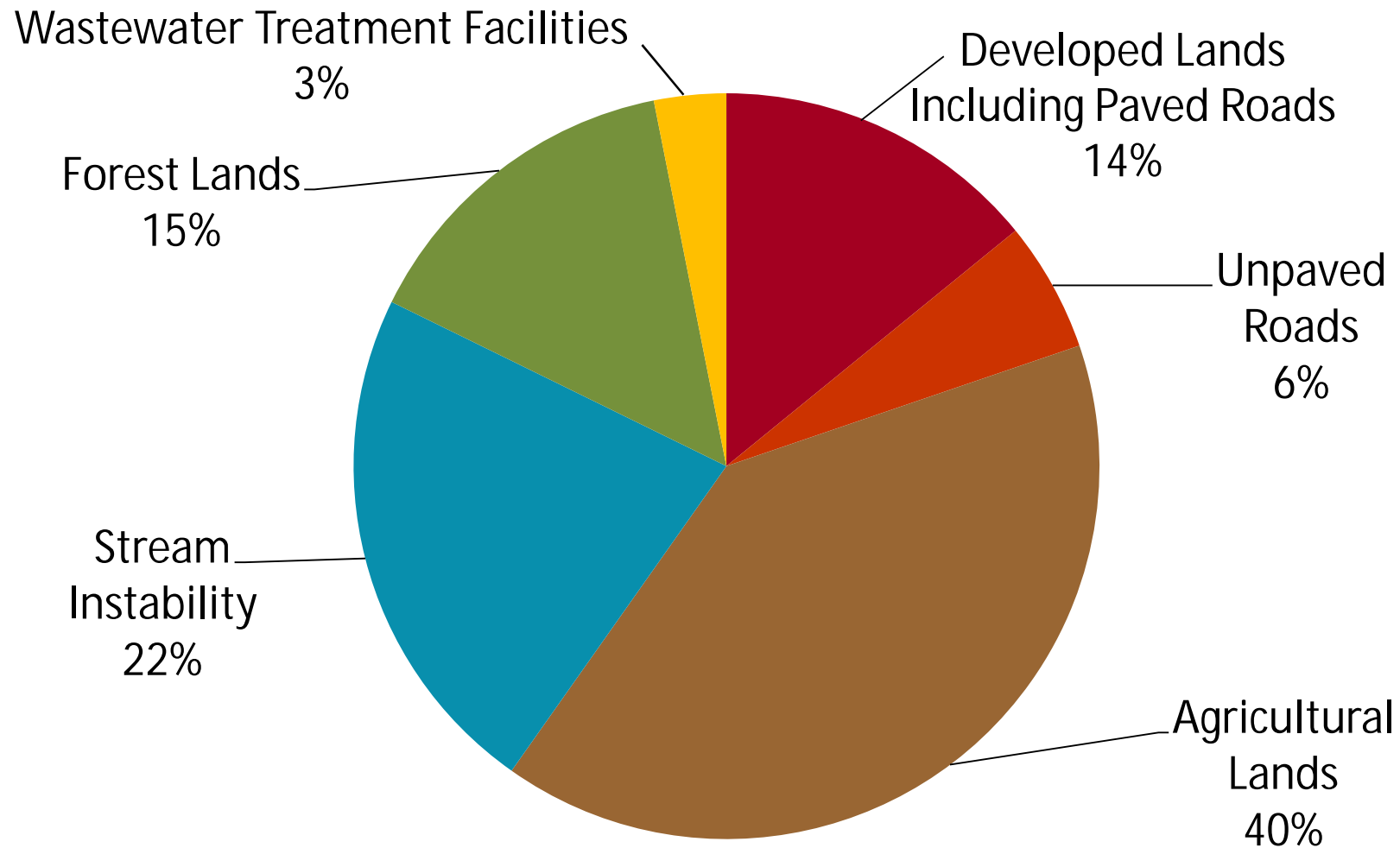


Trey Martin, Deputy Secretary  
Agency of Natural Resources  
February, 2015

# Trends in Lake Champlain Phosphorus Concentrations



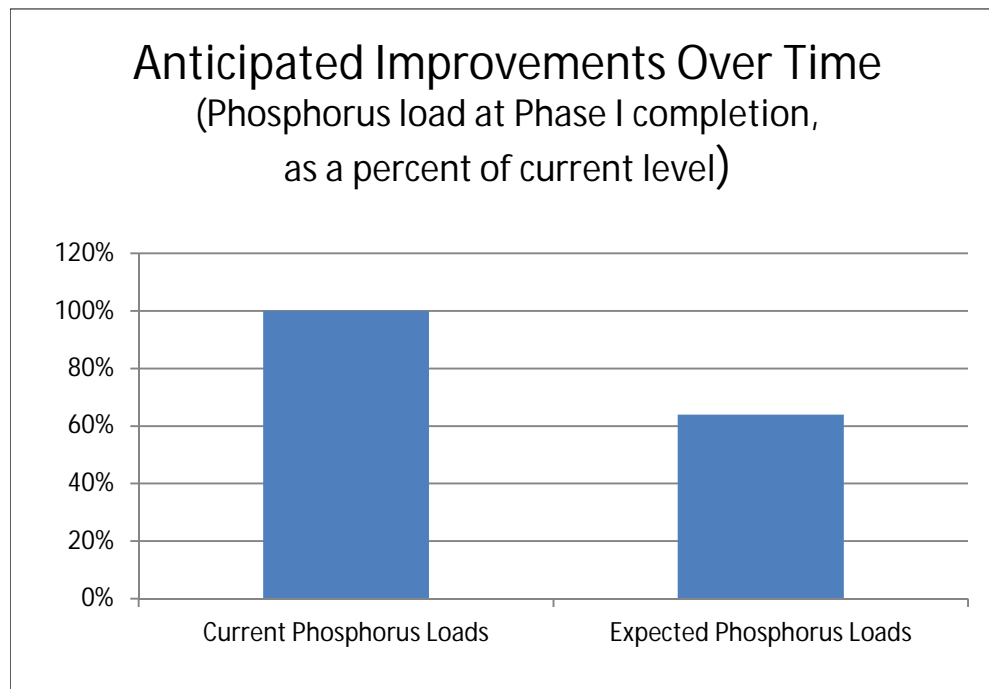
# Phosphorus Sources in the Vermont Portion of the Lake Champlain Basin



# Expected Outcomes from the Lake Champlain Phosphorus TMDL Phase I Plan

## Summary of Phase I Plan


- Expected to reduce phosphorus loading by 34% over 20 years to meet State Water Quality Standards
- Targets major source areas using cost-effective actions



VERMONT LAKE CHAMPLAIN  
PHOSPHORUS TMDL PHASE 1  
IMPLEMENTATION PLAN

PREPARED BY THE STATE OF VERMONT  
FOR THE  
U.S. ENVIRONMENTAL PROTECTION AGENCY

MAY 29, 2014



# Challenges in Providing Clean Water Statewide

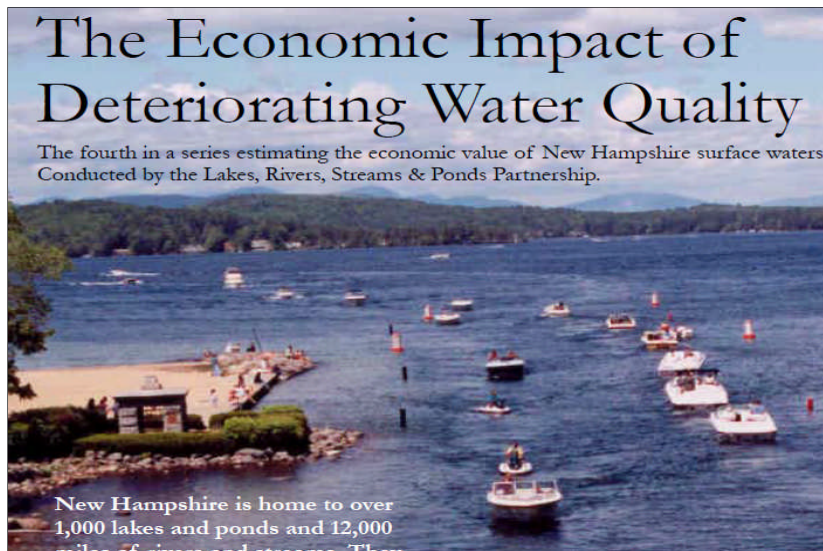
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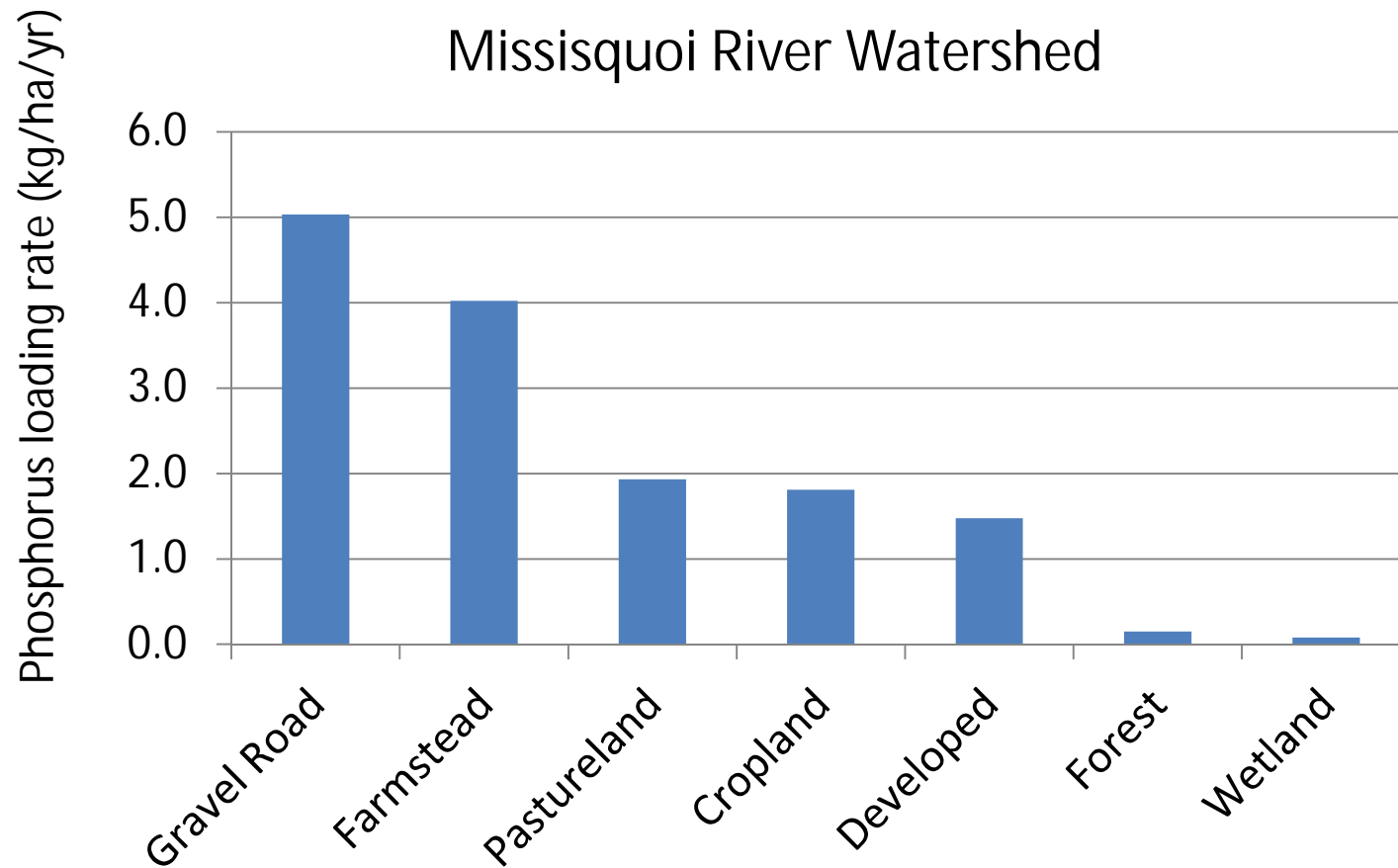
## Fundamental Problem: Economic Harm

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- The decline in the health of our waters has economic impacts:
  - Loss of uses such as boating, swimming, fishing
  - Decline in natural resource-based tourism
  - Decline in property values
  - Cost of water treatment
  - Cost of reducing the pollution

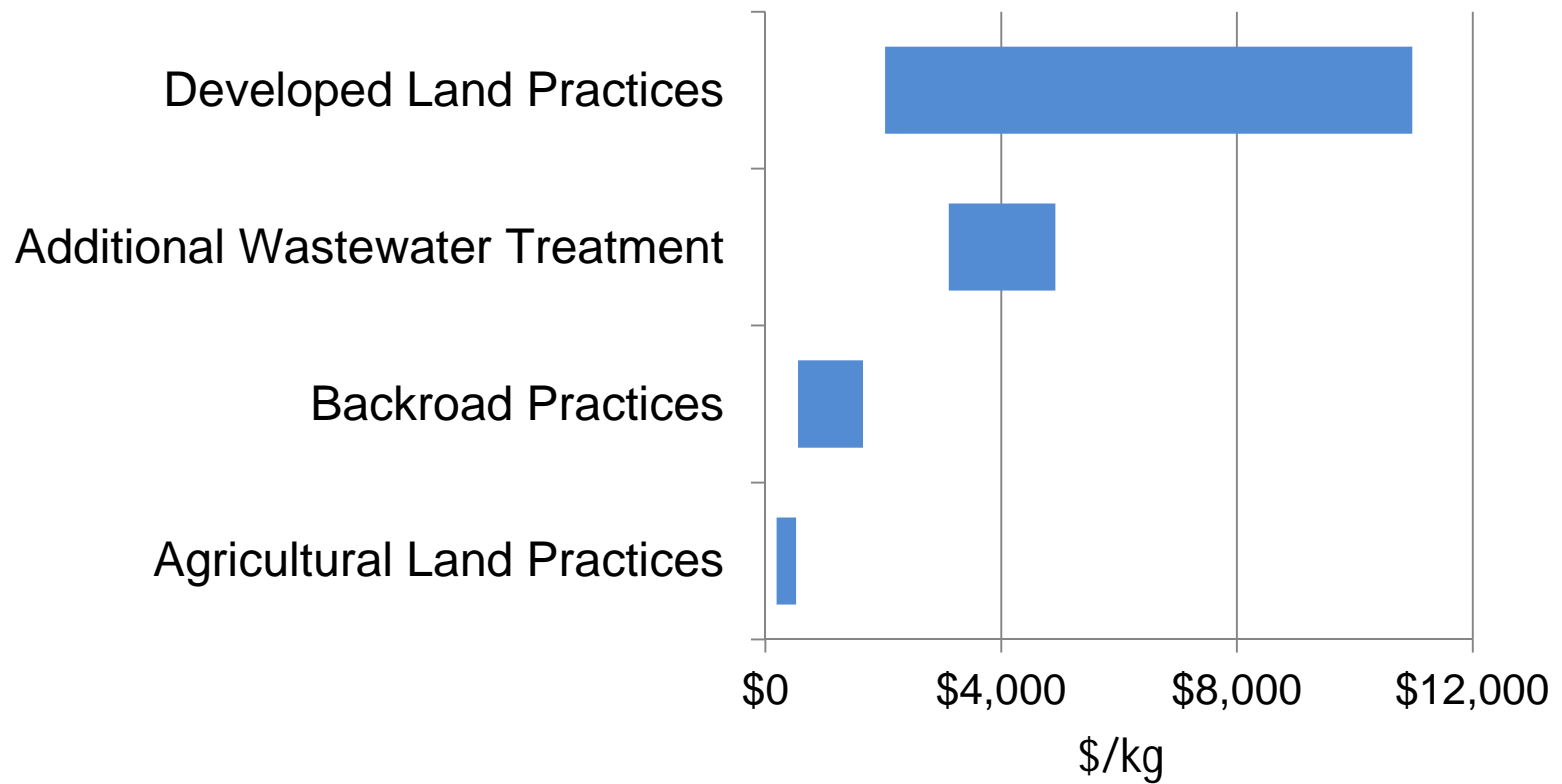


# TMDL Plan's Strategic Focus is based on Relative Ranking of Critical Sources of Phosphorus (per unit of land area)



# Relative Cost-Effectiveness of Actions by Source

Range of Annualized Cost  
(per kilogram of Phosphorus Reduced)





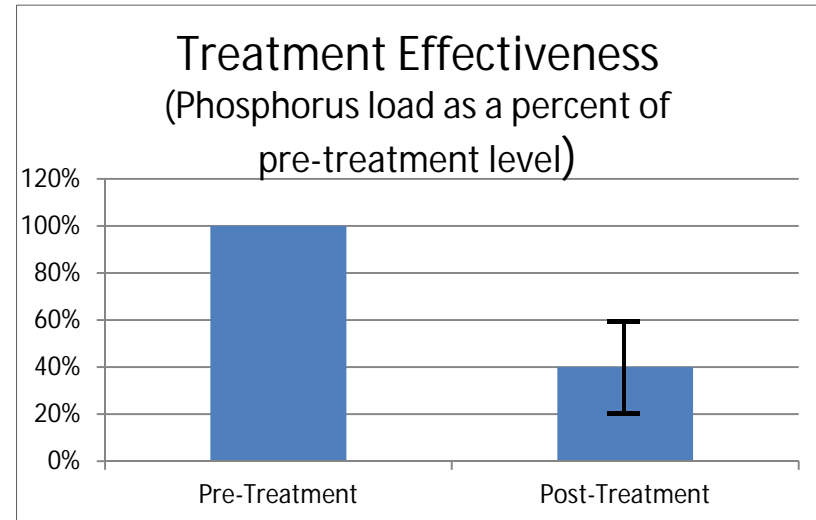
# Lake Champlain Phosphorus TMDL Draft Phase I Implementation Plan

Program Area
Agricultural Programs
Stormwater Management
Rivers Management
Wetlands Management
Lakes Management
Forest Management

# Agricultural Programs

Proposed Rule Update: State Accepted Agricultural Practices  
Example: Vegetated buffer on Field and Roadside Ditches

- Achieves 40%-80% reduction in Total Phosphorus
- Estimated project cost = \$1,350 (3 acres treated)



Runoff draining into ditch



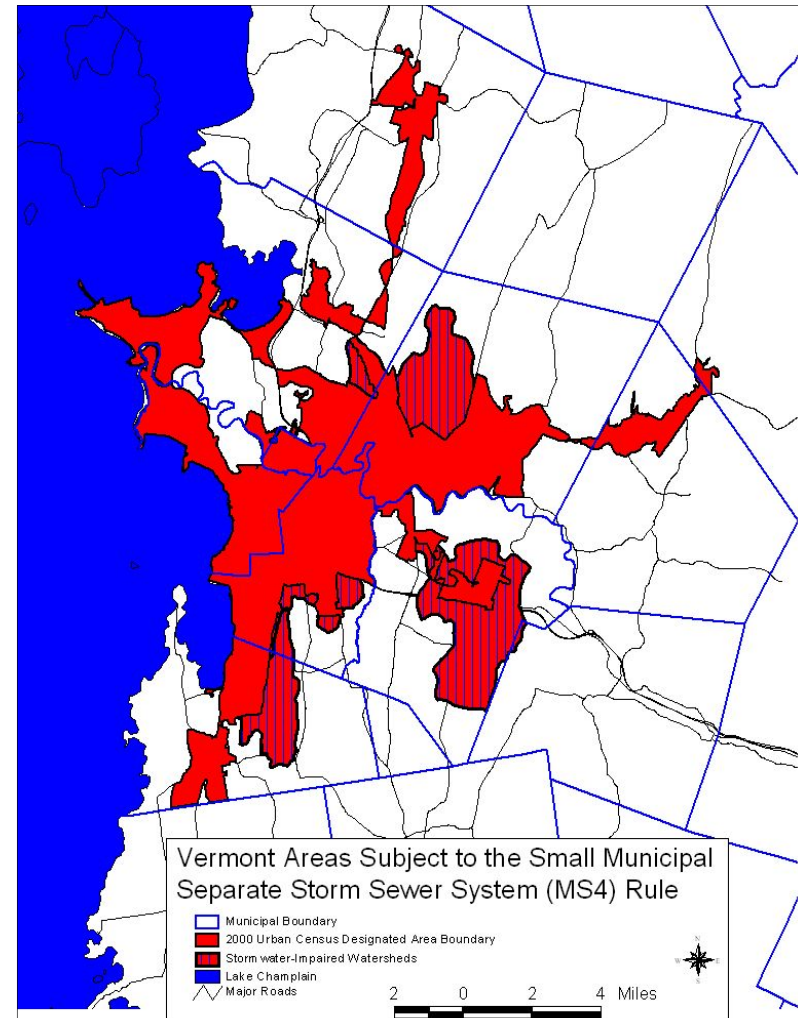
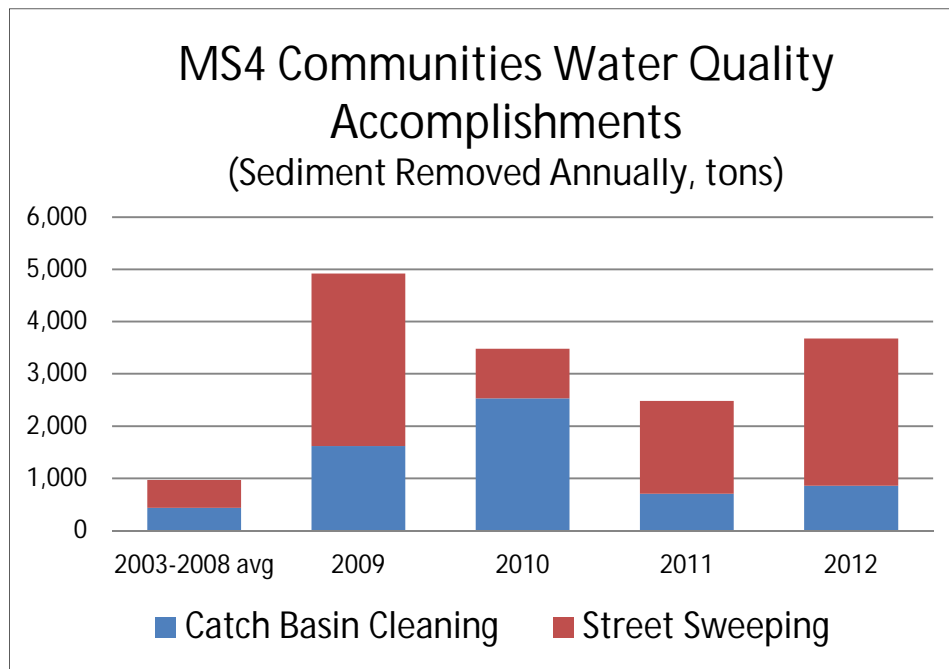
Vegetated buffer along ditch

# Stormwater Management

## Stormwater Runoff - Existing Developed Lands

### Municipal Stormwater Management

- 2 actions prevent 2,000-4,000 tons of sediment from reaching State waters annually

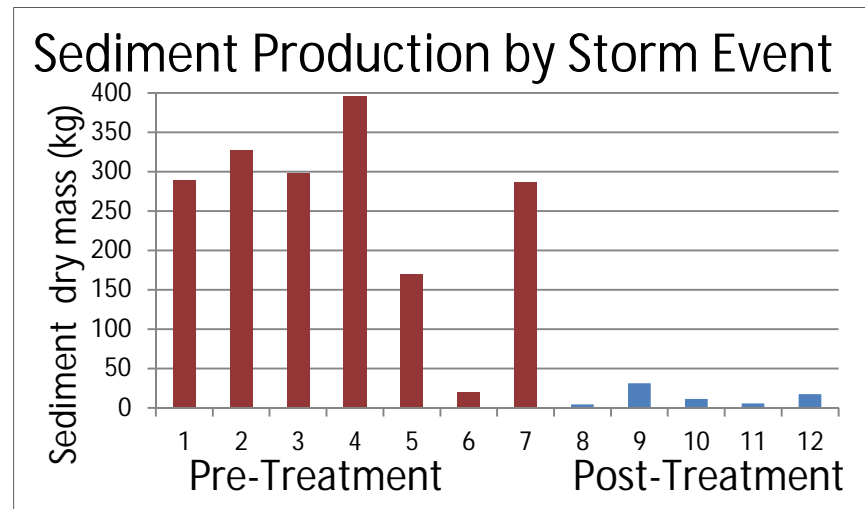


# Stormwater Management

## Stormwater Runoff - Municipal Roads

### Sediment and Erosion Control Washington County

- UVM Controlled Study found a dramatic reduction in polluted runoff from Best Practices such as rock-lining ditches on steep roads
- Estimated project cost = \$3,000 (1,000 linear feet treated)



Wemple, 2013



Eroding roadside ditch



Ditch stabilization saves road and reduces erosion 12

# “Better Roads, Cleaner Waters”

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- Reduce concentrated drainage
- Reduce sediment and nutrient pollution
- Reduce impact of road on the land
- Reduce long-term maintenance costs
- Improve local resilience to storm damages



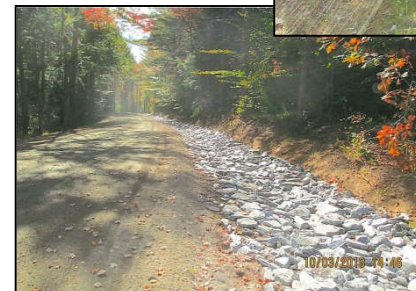
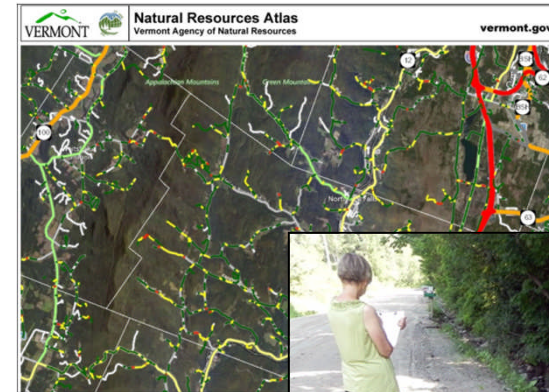
# Municipal Roads Stormwater Permit

for existing, new and redeveloped municipal roads

Goal: To stabilize municipal road drainage systems, consistent with Town Road and Bridge Standards

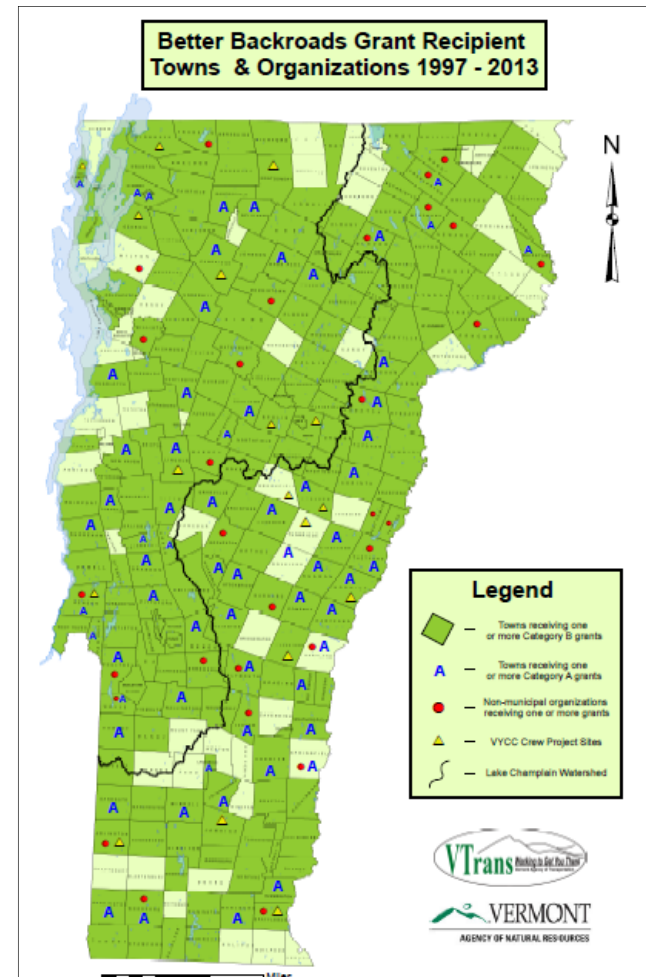
Process:

- Develop permit & standards with public input
- Municipalities develop a customized multi-year plan
- Municipal implementation prioritized by greatest benefit & local transportation capital plan
- Reporting to DEC on implementation
- Full implementation within 20 years



# Educational, Technical, and Financial Assistance

- Vtrans Better Back Roads Program
- Vtrans Local Roads Program
- DEC Ecosystem Restoration Program

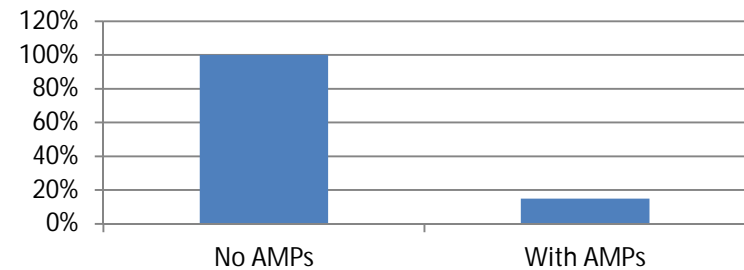


# Forest Management

## Acceptable Management Practices (AMPs)

- Can reduce phosphorus loading by 85%
- 60% of VT forests are subject to AMP compliance or equivalent, as required under Current Use Program and public land management practices
- Estimated project cost = \$3,000 (per crossing)

Effectiveness of Forestry Practices  
(Phosphorus load as a percent of load from watersheds logged without AMPs applied)



Edwards, Williard, 2010



**IMPACT**

Unmanaged stream crossing at logging site



Temporary skidder bridge



# Vermont: A Small State Facing Big Challenges to Implement Plan

State will need to tap into existing & new sources to implement plan

