

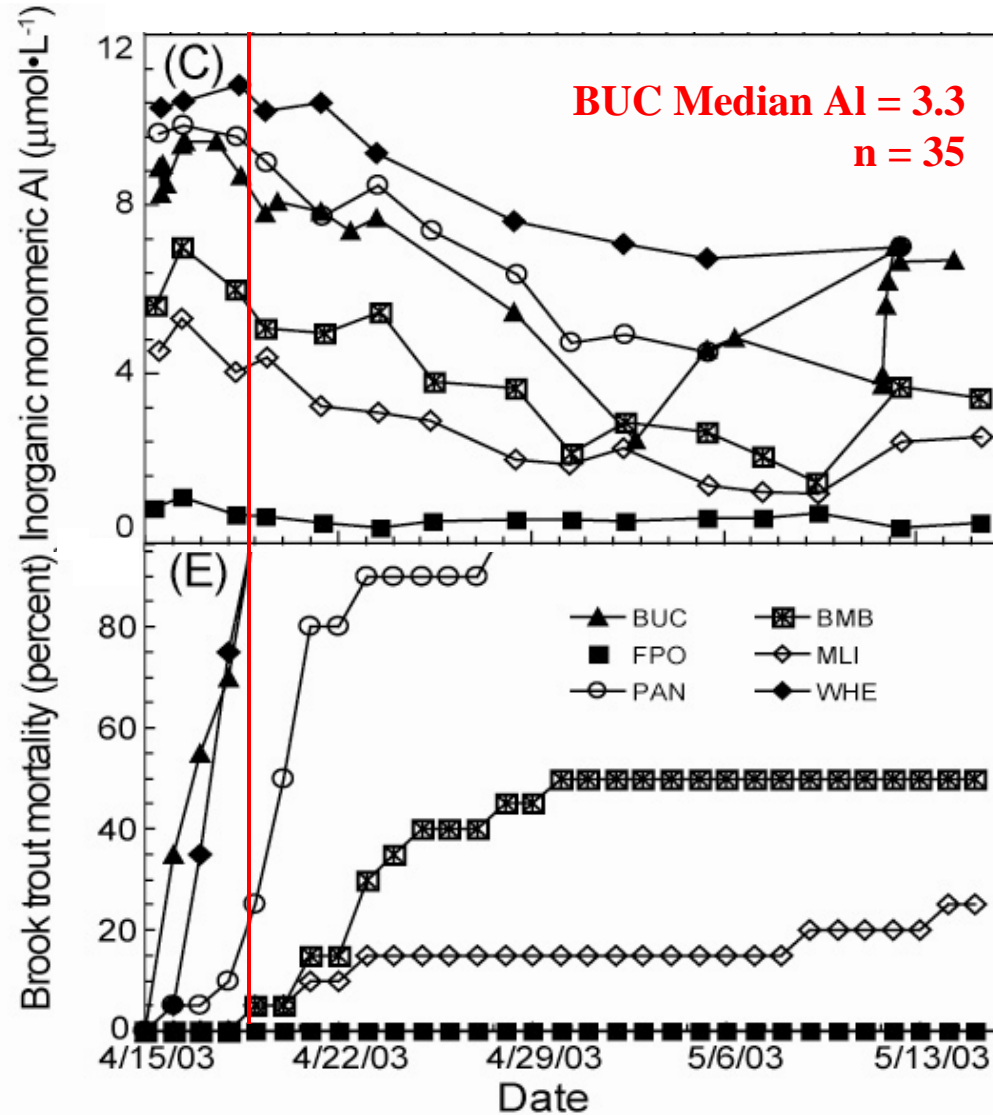
# Linking Episodic Stream Acidification to Soil Chemistry in Assessments of Recovery from Acidic Deposition



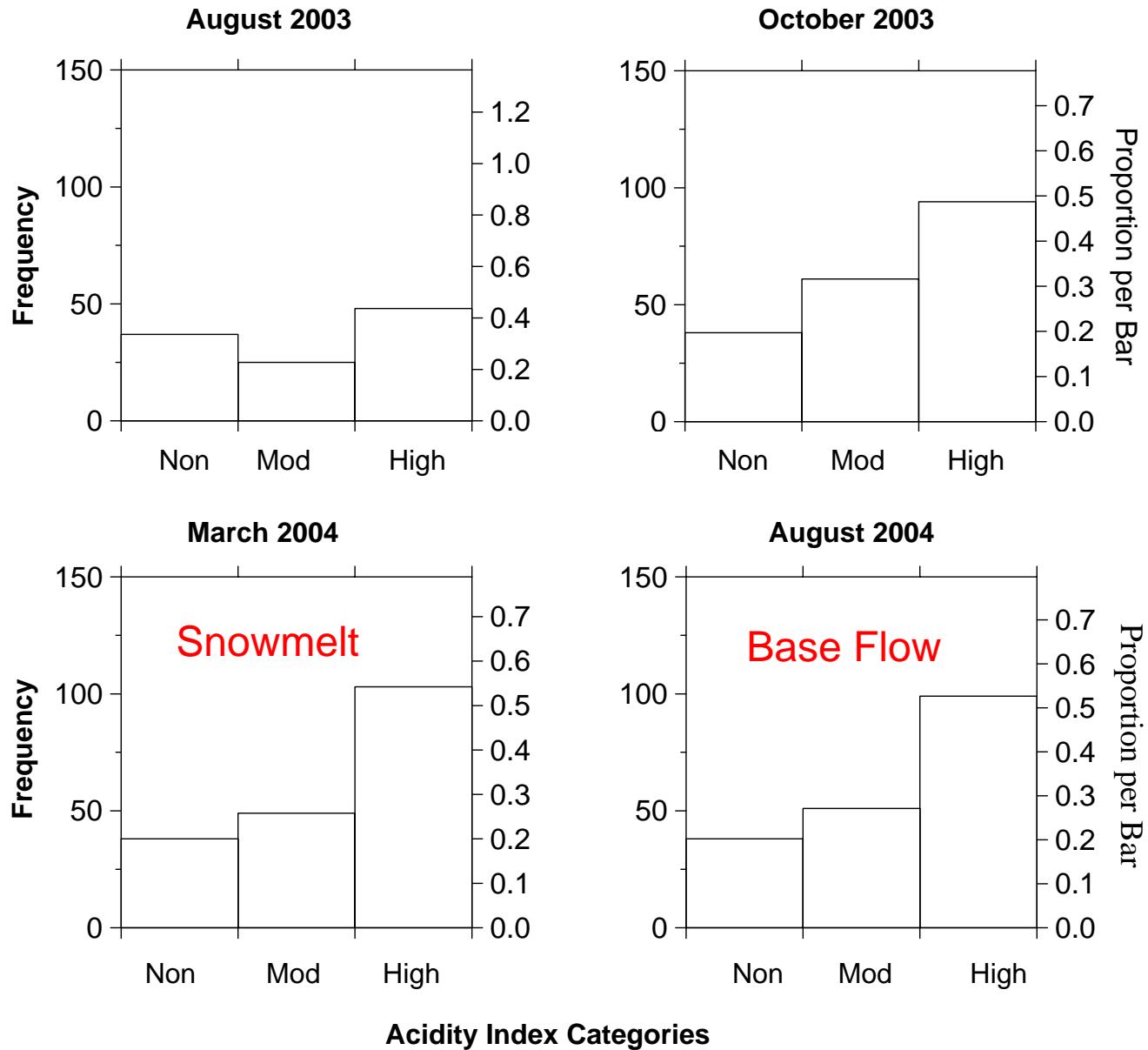
## *Results from the WASS*

- 
- Lawrence, G.B., *USGS*
  - Roy, K.M., *N.Y. State Dept. of Environ. Conservation*
  - Baldigo, B.P., *USGS*
  - Passy, S.I., *Univ. of Texas at Arlington*
  - Simonin, H.A., *N.Y. State Dept. of Environ. Conservation (retired)*
  - Shortle, W.C. *USDA Forest Service*
  - Smith, K. T., *USDA Forest Service*
  - David, M.B. *Univ. of Illinois*

# Episodes in Adirondack Streams - 2003



# Acidification Impacts on Diatoms - WASS Results



# Macroinvertebrates – WASS Results



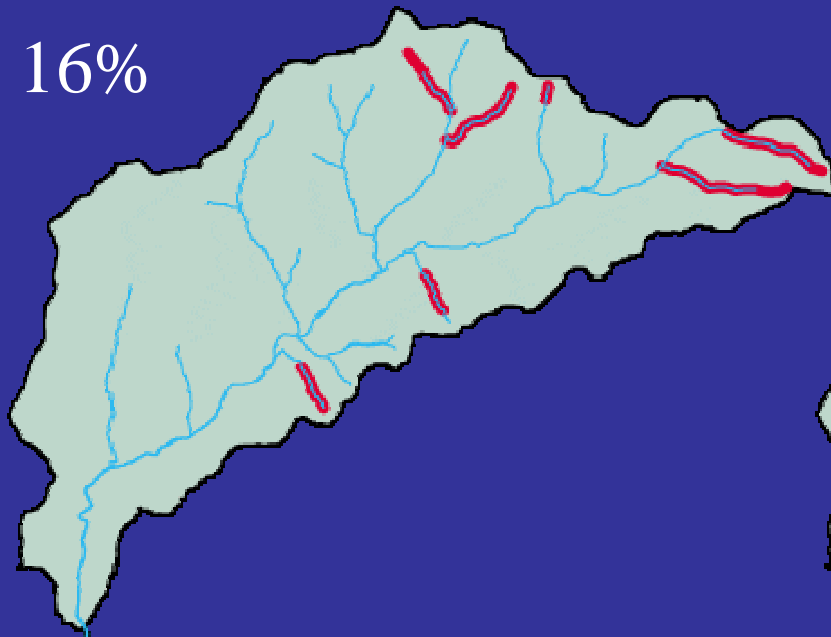
35% of streams were chronically acidified.

52% of streams had macroinvertebrate communities moderately to severely impacted by acidification.



# Neversink Watershed, Catskill Region

16%



82%



Chronic Acidification

Episodic Acidification

— Acidic Stream Segments

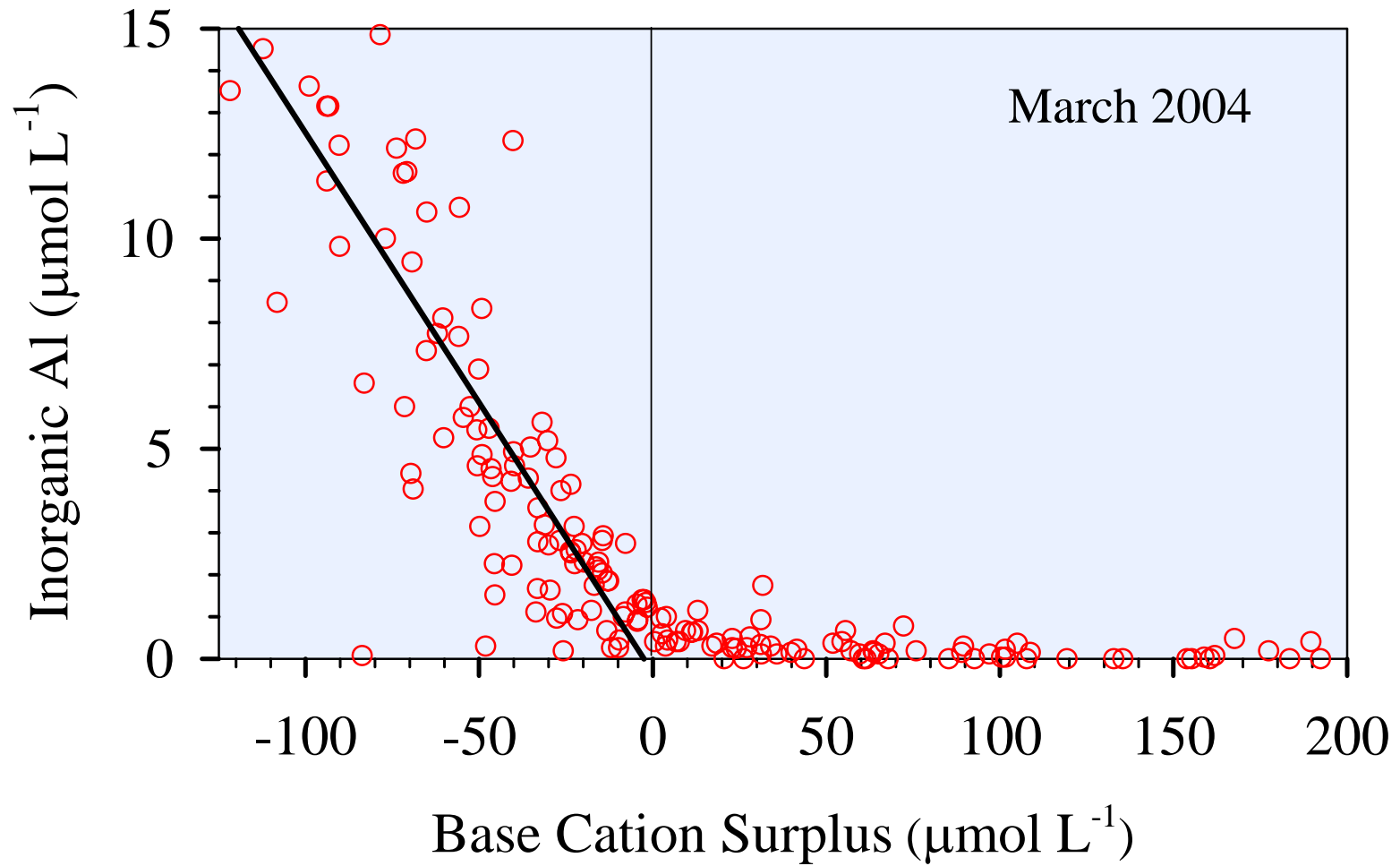
0 1 2 km

## Results of the 200-Stream WASS

1. One third of streams, were chronically acidified.
2. An additional one third were episodically acidified.



# Threshold for Al Mobilization



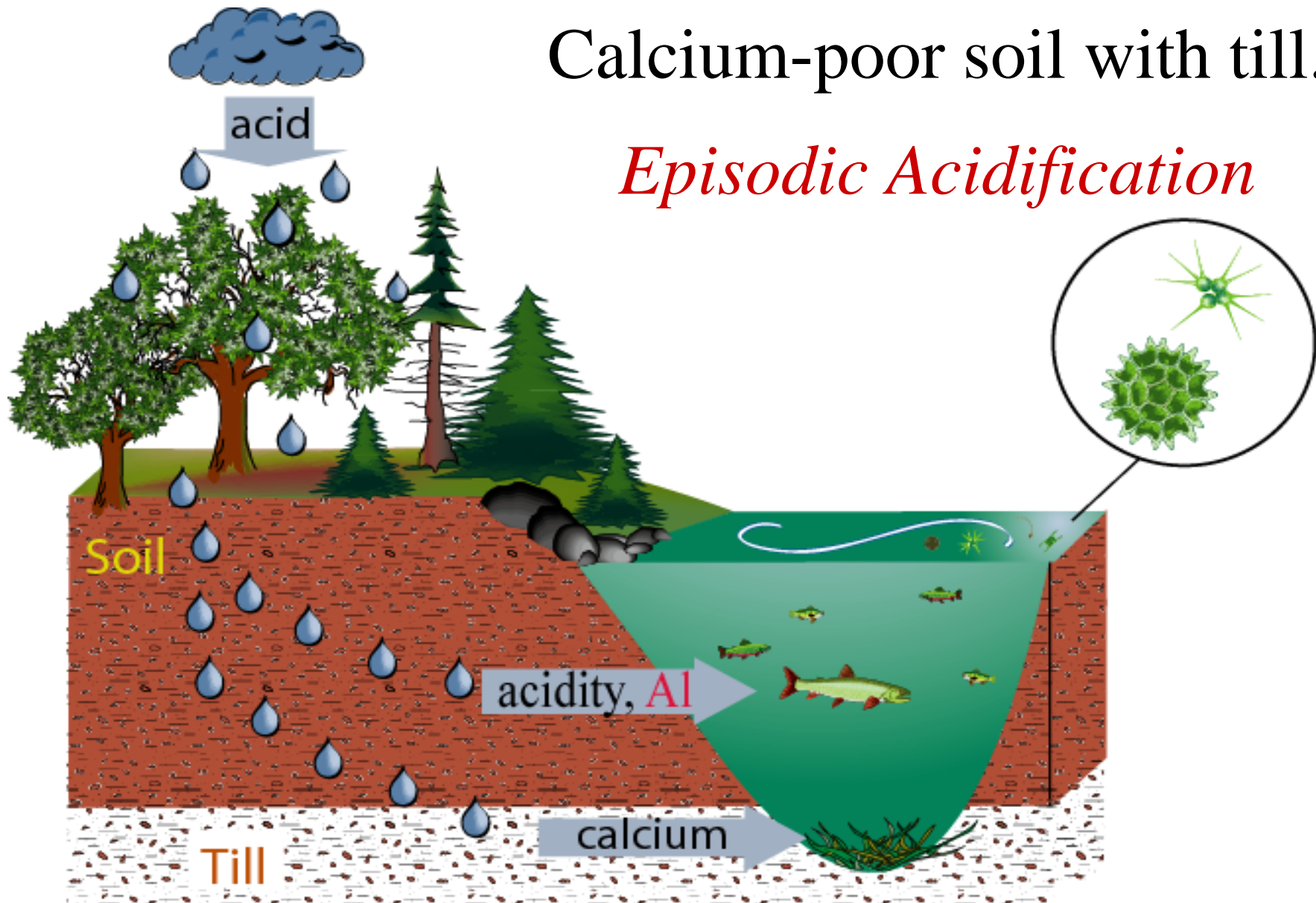
## Base Cation Surplus

$$(\text{Ca}+\text{Mg}+\text{Na}+\text{K}) - (\text{SO}_4+\text{NO}_3+\text{Cl}+\text{RCOO}^-_s)$$

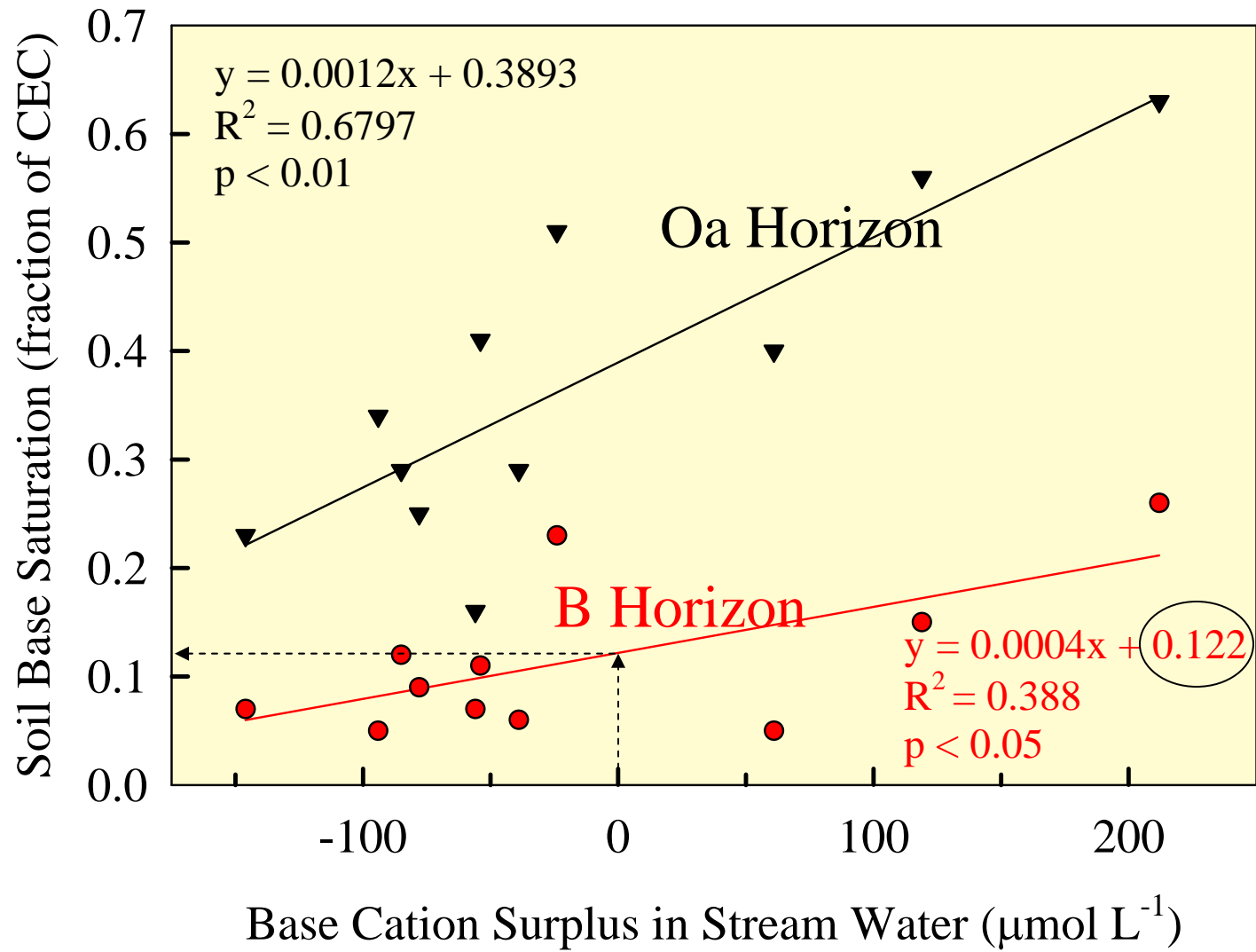


Calcium-poor soil with till.

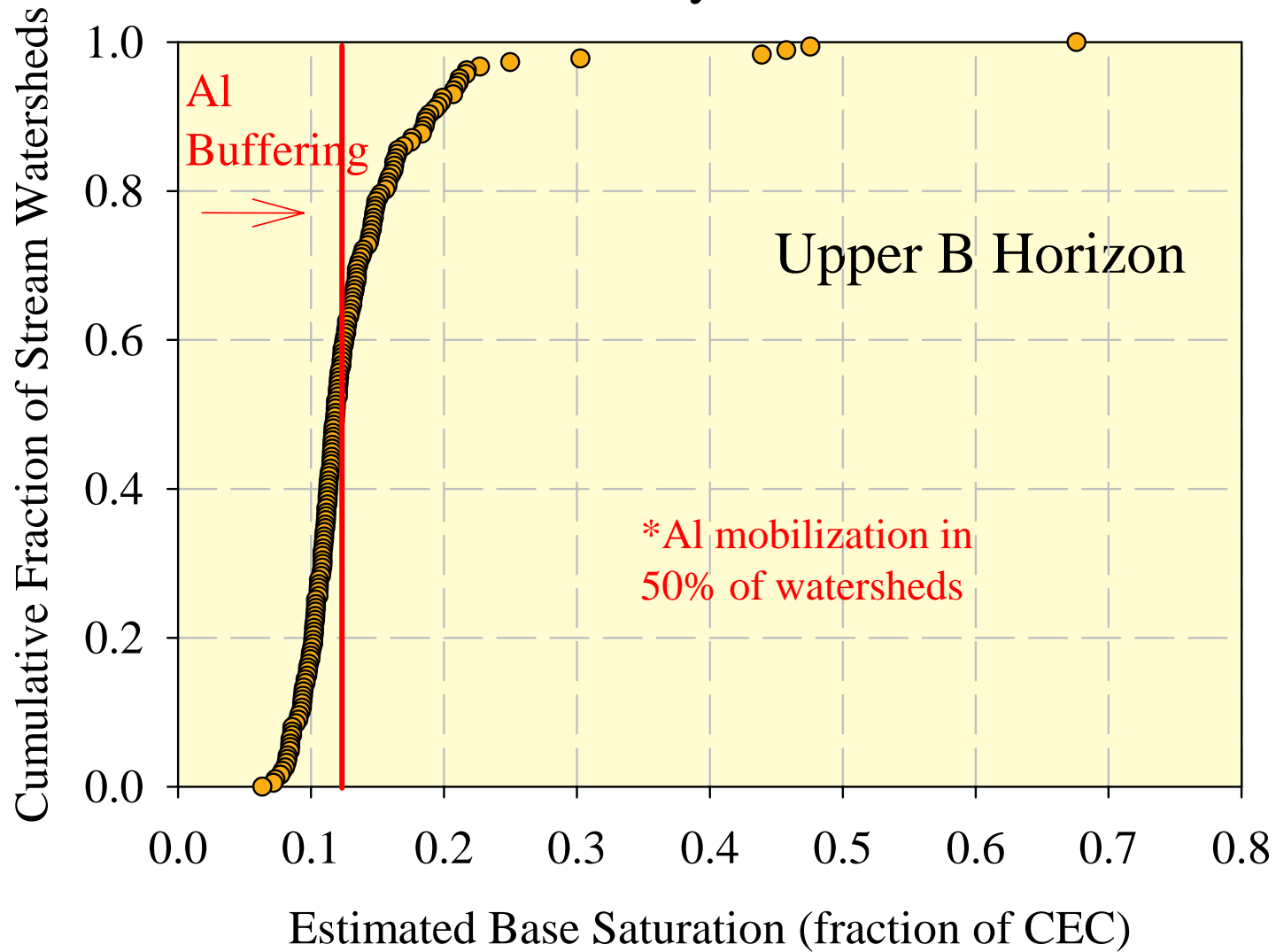
*Episodic Acidification*



# Soil Stream - Water Relations



# WASS 200 Study Watersheds

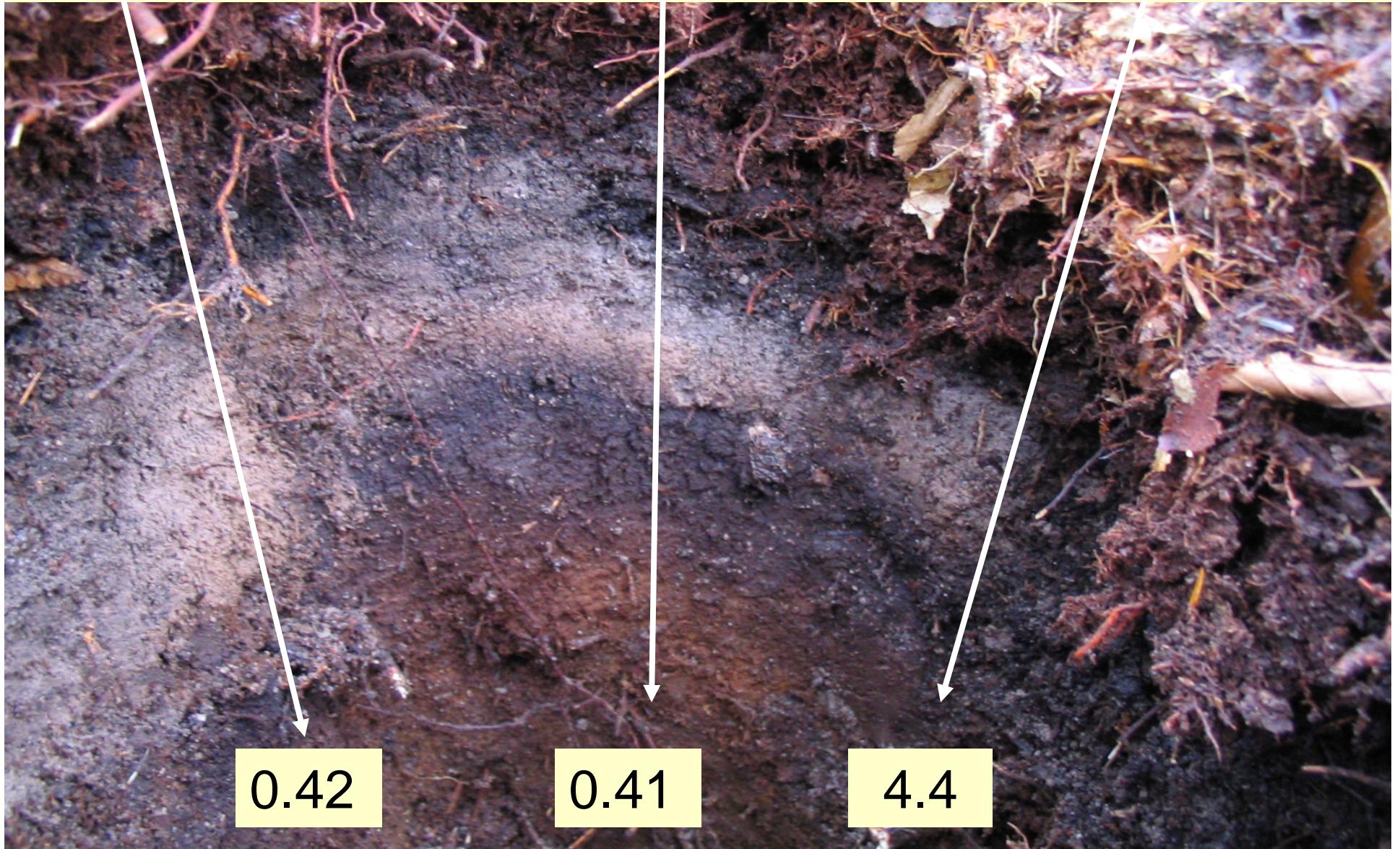


Base Saturation = 11%

Exch. Ca

Exch. H

Exch. Al



# B Horizon Near Big Moose Lake

	<u>1992-93</u>	<u>2003</u>
• Exch. Ca	0.21	0.21
• Exch. H	1.9	3.4
• Exch. Al	3.6	6.4*
• Ca:Al	0.058	0.032

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\*p < 0.05

N = 12

Units in  $\text{cmol}_c \text{ kg}^{-1}$

# **Northeastern Soil Monitoring Cooperative**

(Northeastern U.S. and Eastern Canada)

**Goal:** To regionally characterize soil change through the application of soil monitoring techniques.

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## **Funded Projects for 2009**

- Assessment of repeated soil sampling as a monitoring tool for investigating the effects of changes in soil chemistry on trends in tree growth.
- Development of a regional, on-line soil database linked to a regional soil archive.



## Summary

1. Episodic acidification harms aquatic life.
2. Episodic acidification is tied to soil processes.
3. A focus on soil change is needed for assessing recovery potential of both aquatic and terrestrial ecosystems.