Trends in Adirondack Streams and Soils

Contributing Projects

- **Western Adirondack Stream Survey (WASS)**
- **Buck Creek Watershed Study**

Investigators

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Chemical Data Available to Assess Stream Trends

1. Comparisons between 1980-85 data and WASS 2003-05 data (Simonin).
2. Weekly ANC and pH at Bald Mountain Brook and Buck Creek; *1991 to 2001*.
3. Biweekly and high-flow chemistry, north and south tributaries of Buck Creek; *1998 to 2007*.

Comparison between 1980-85 and 2003-05 for 12 Individual Streams

1. No decreases in pH or ANC_G.

2. pH increase in 8 of 12 streams.
   4/8 increased < 0.3 pH units.
   4/8 that increased in pH didn't increase in ANC_G.

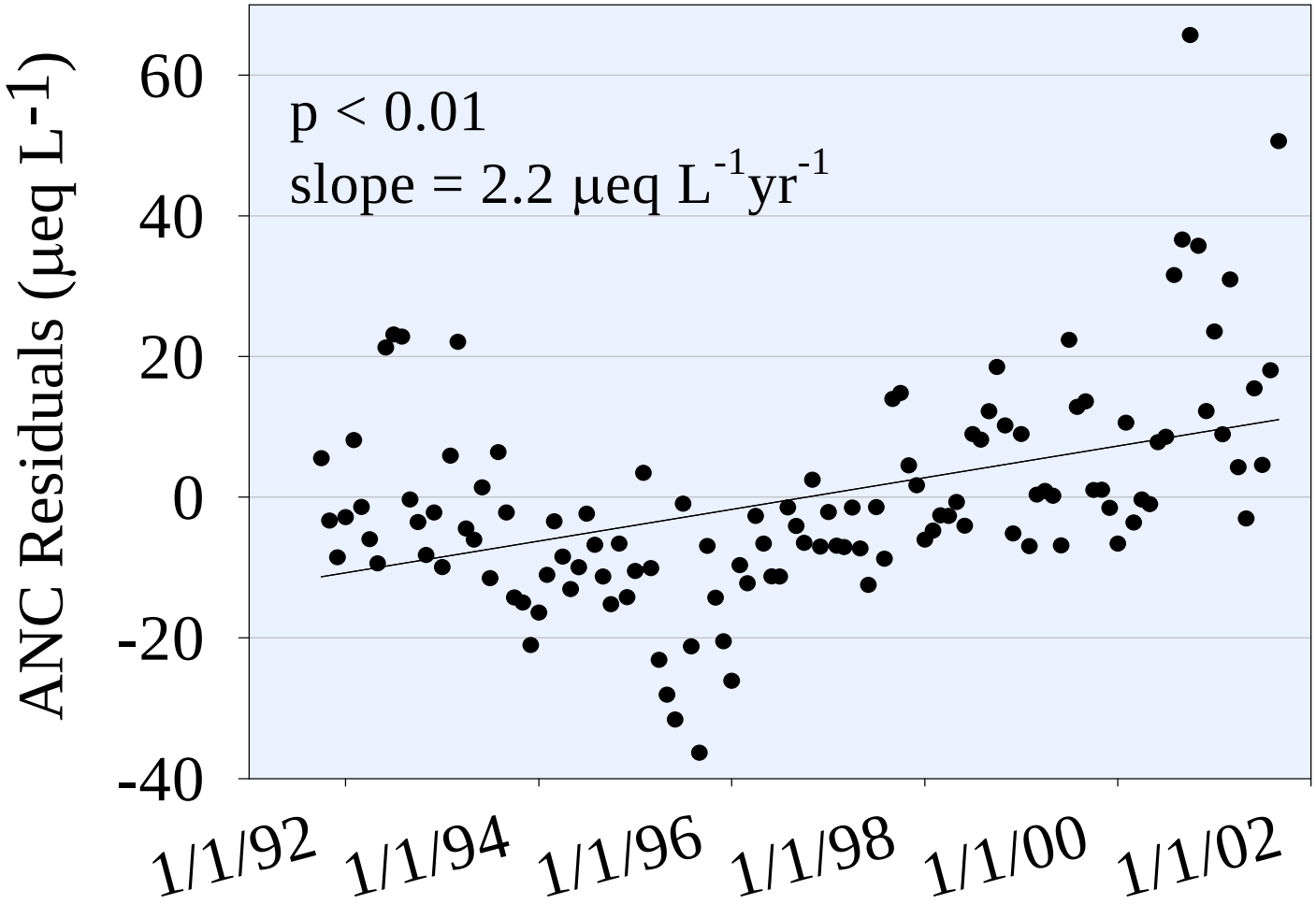
3. ANC_G increased in 4 of 12 streams.
   3/4 increased $\leq$ 0.6 $\mu eq\ L^{-1} yr^{-1}$.

Comparison between 1980-85 and 2003-05 with Streams Grouped

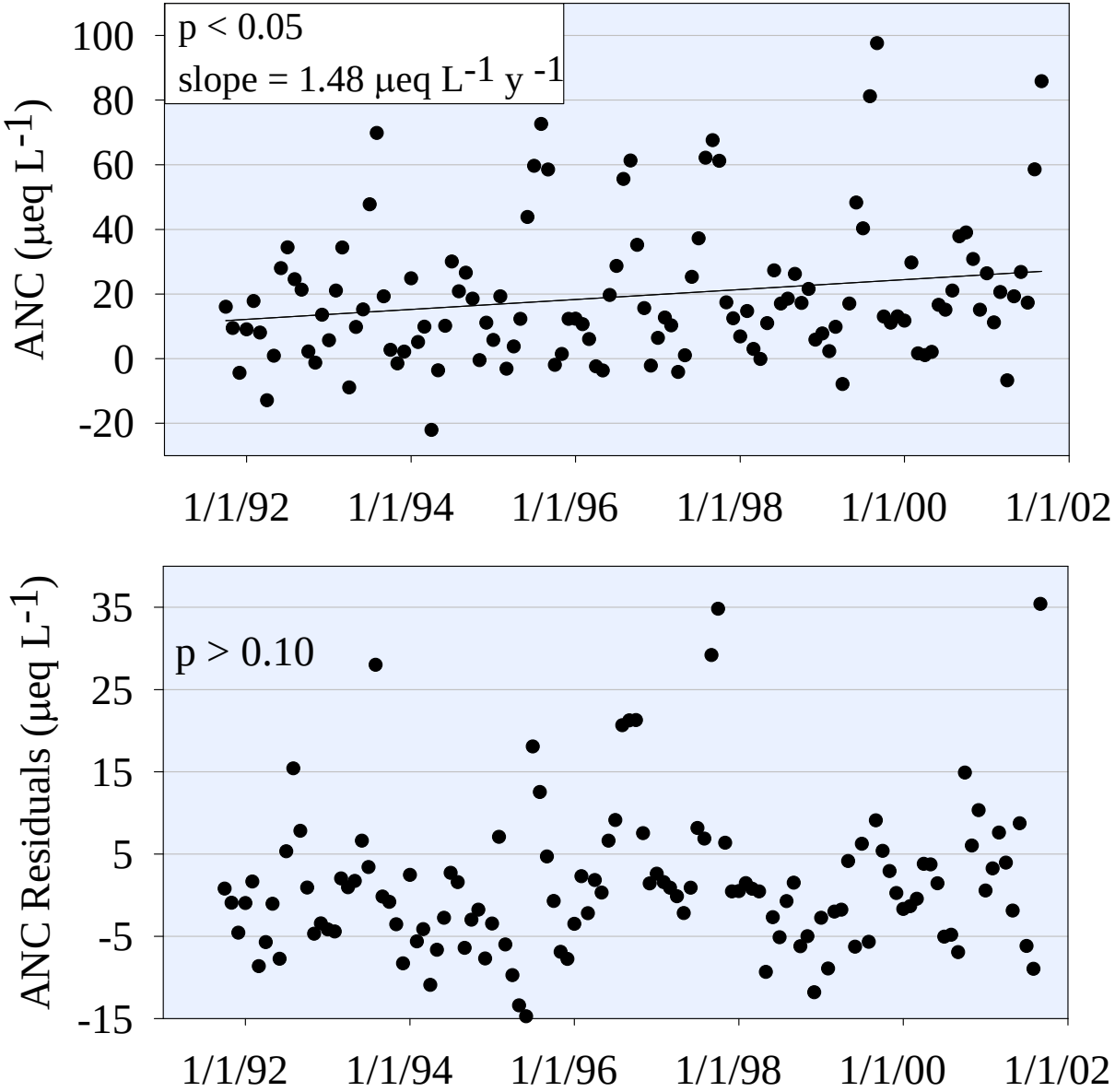
- Total increase in ANC = 13.1 $\mu eq\ L^{-1}$
- Annual Rate of ANC increase = 0.57 $\mu eq\ L^{-1} yr^{-1}$

- Total increase in pH = 0.287
- Annual Rate of pH increase = 0.012 pH units yr^{-1}

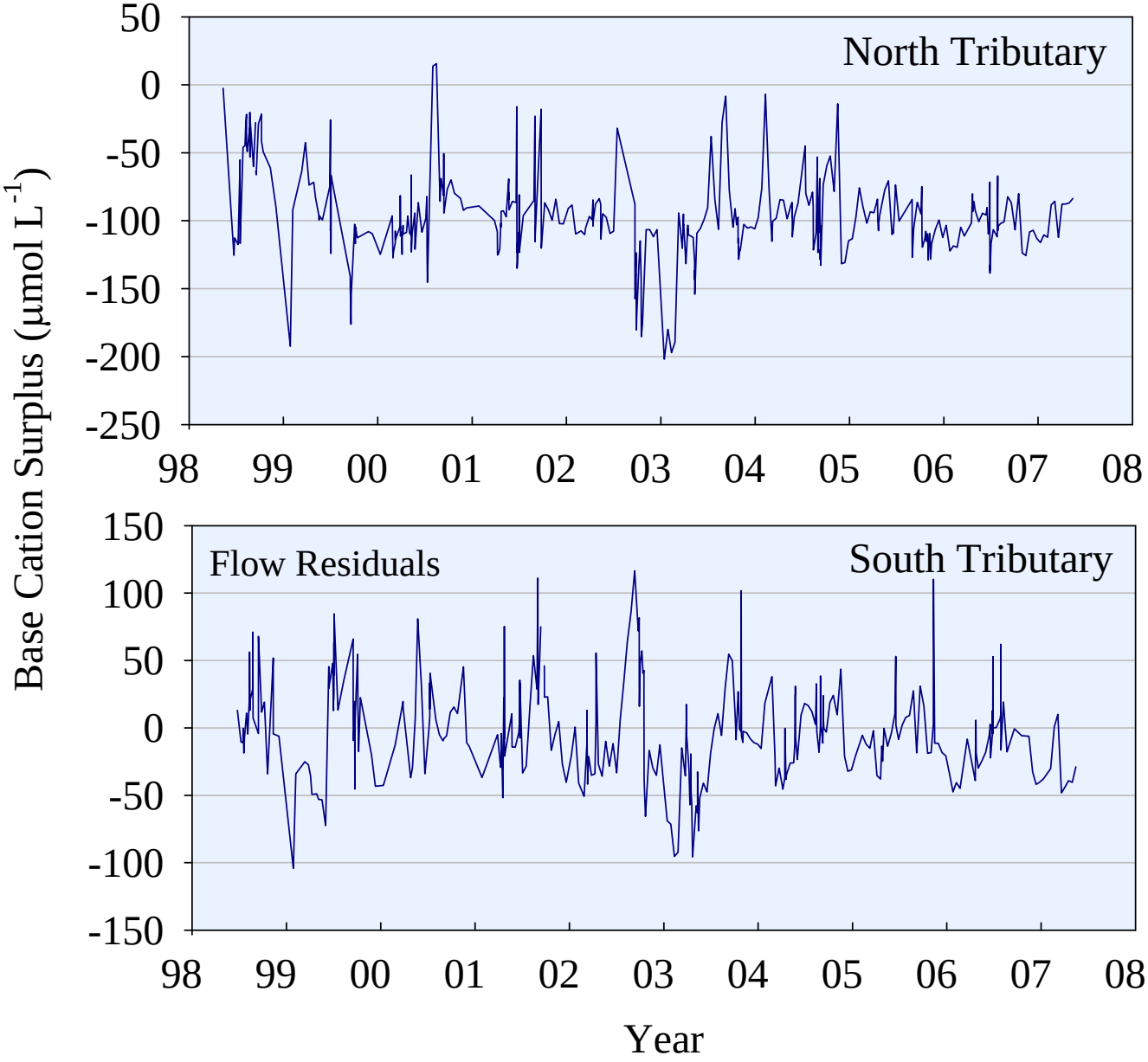
Bald Mountain Brook 1991-2001



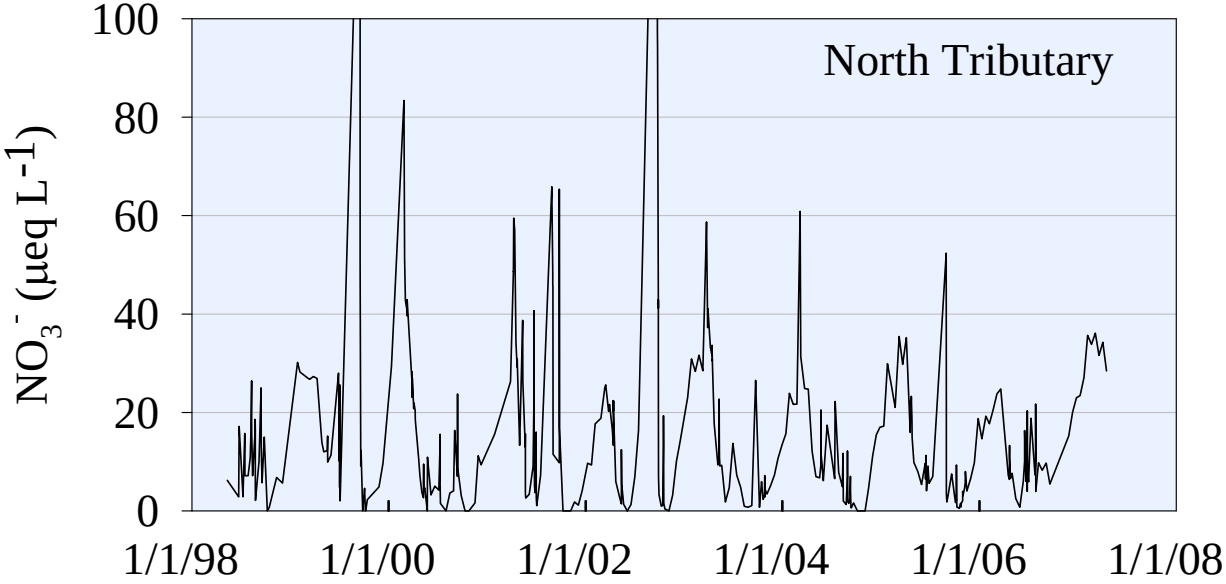
Buck Creek 1991-2001

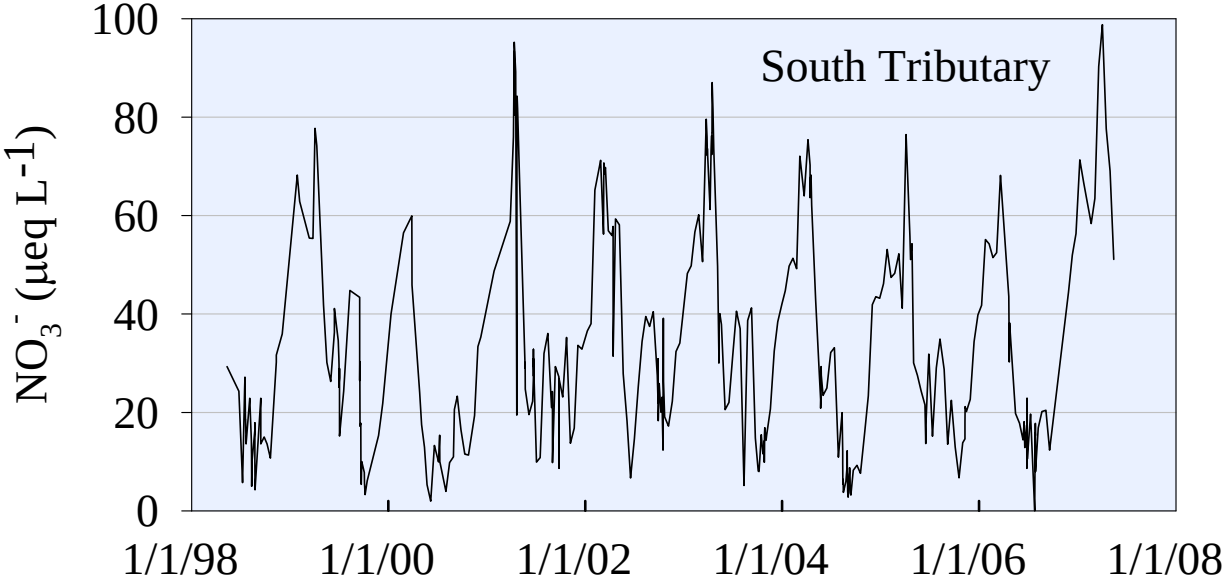


Buck Creek 1998-2007

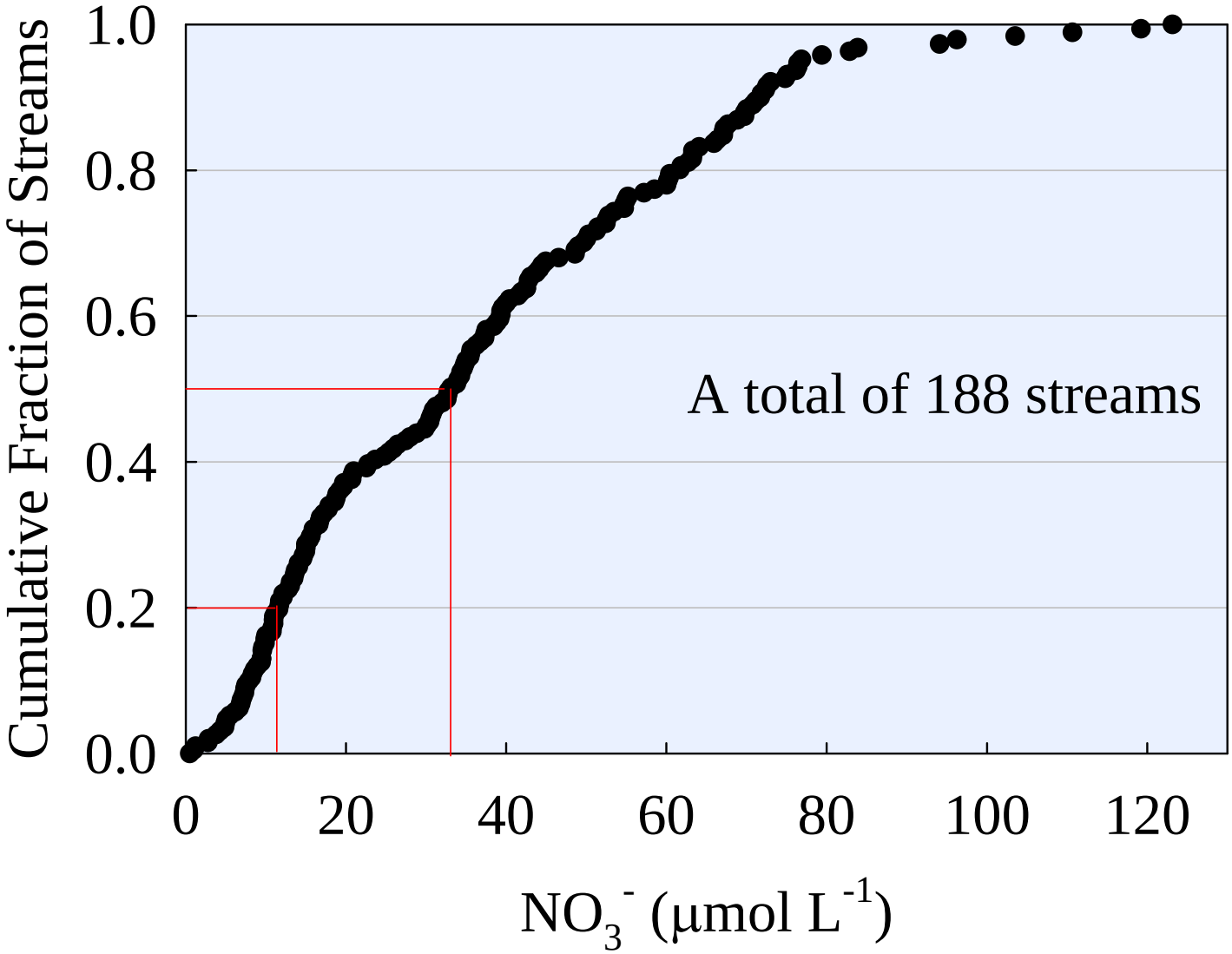


Buck Creek 1998-2007





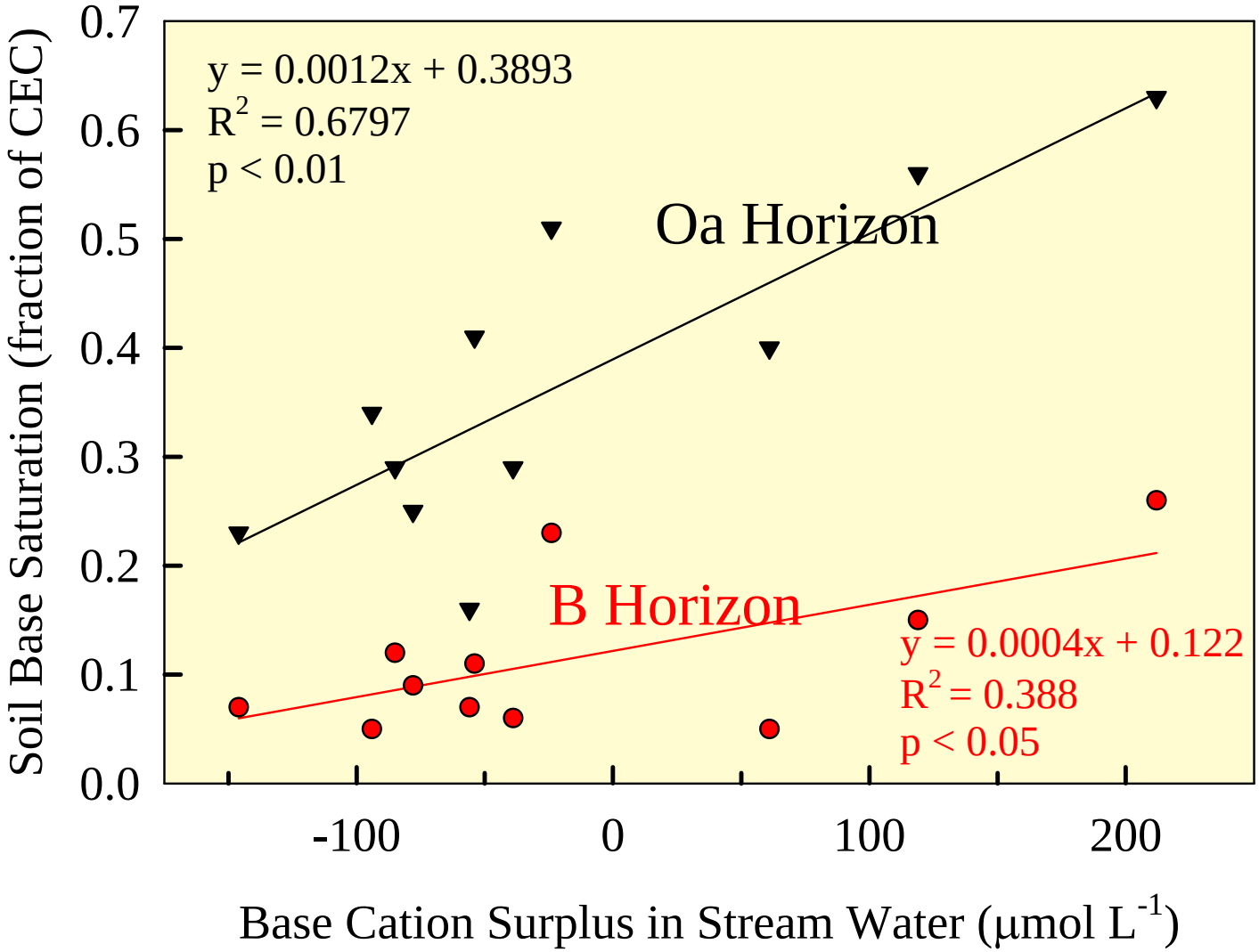
March 2004 Stream Survey

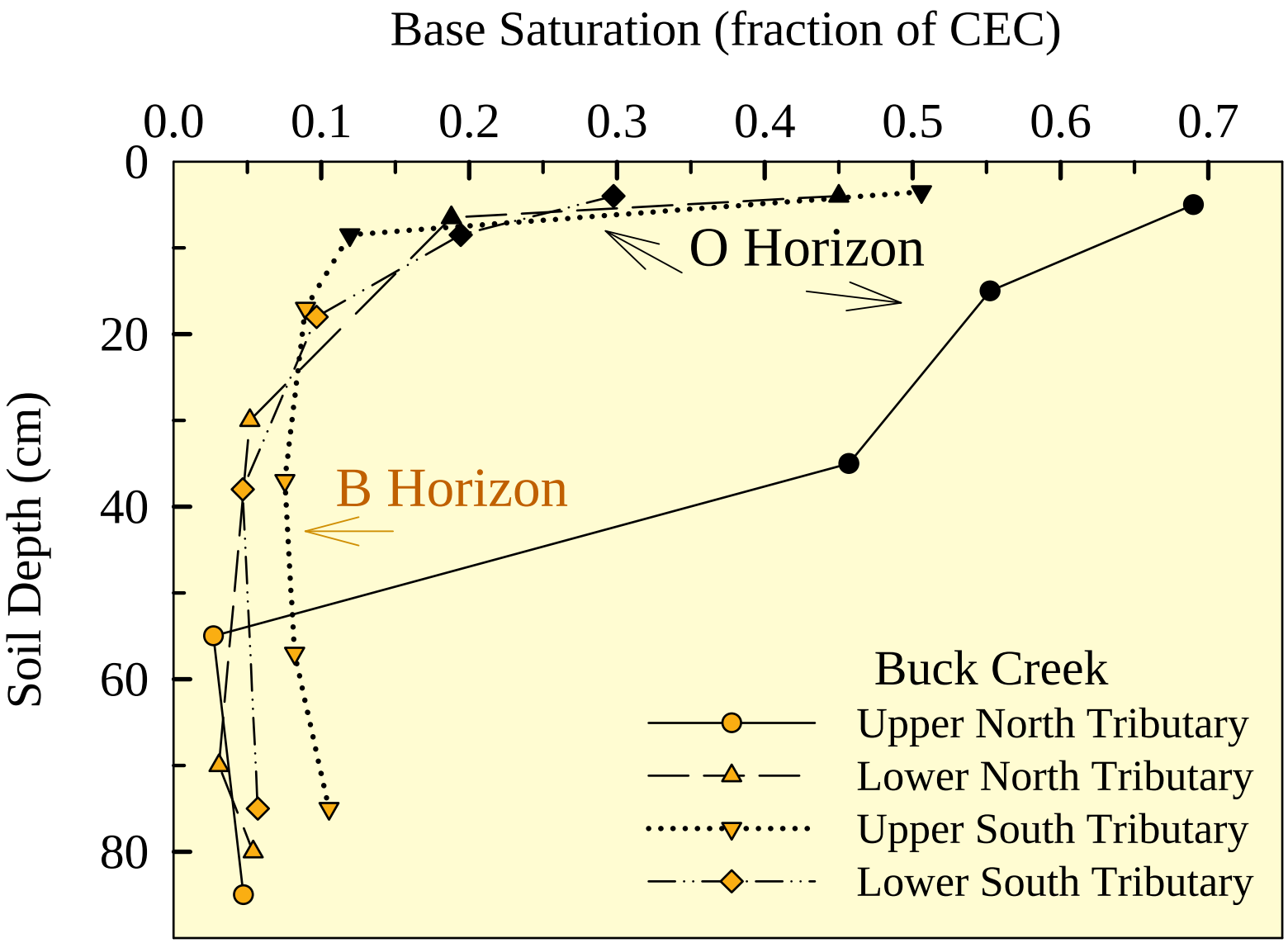


Chemical Data Available to Assess Soil Trends

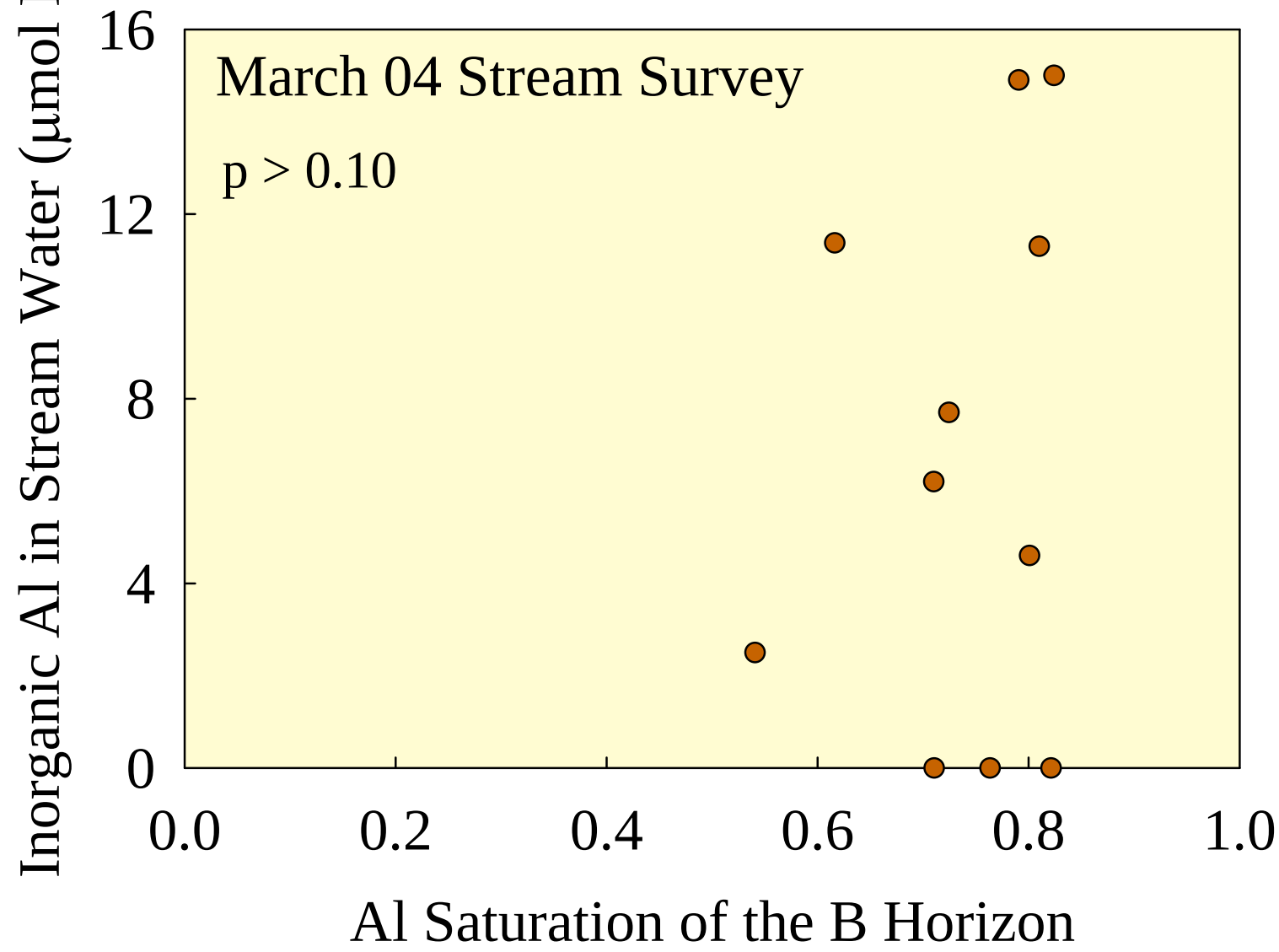
1. Johnson et al. (1984): lower pH and extractable Ca in Oa horizons in 1984 than 1930.
2. Sullivan et al. (2006) found lower base saturation in B horizons in 2003 than in the mid 1980's.

Soil Stream -Water Relations

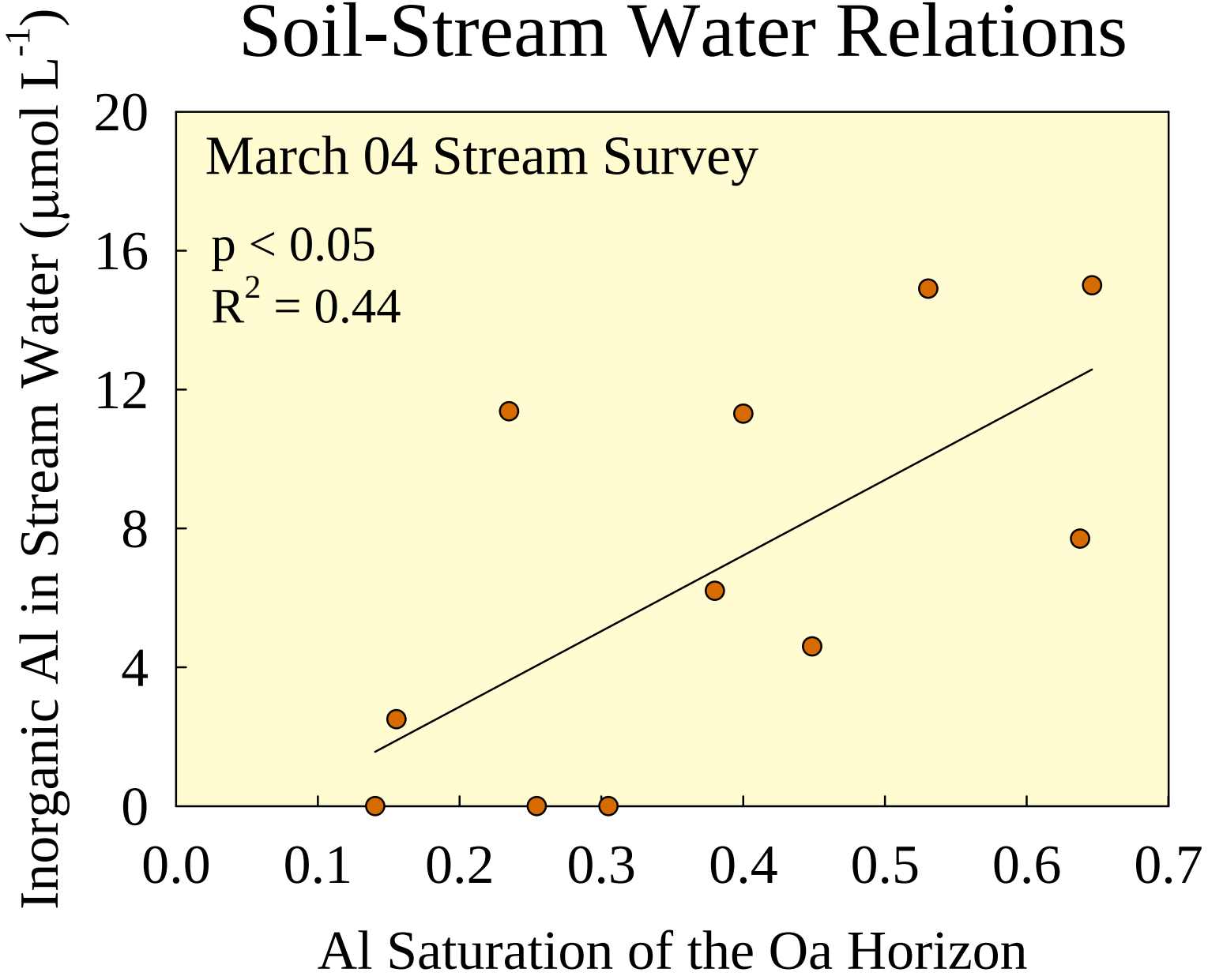



Base Saturation (fraction of CEC)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
20
40
60
80
Soil Depth (cm)
O Horizon
B Horizon
Buck Creek
Upper North Tributary
Lower North Tributary
Upper South Tributary
Lower South Tributary

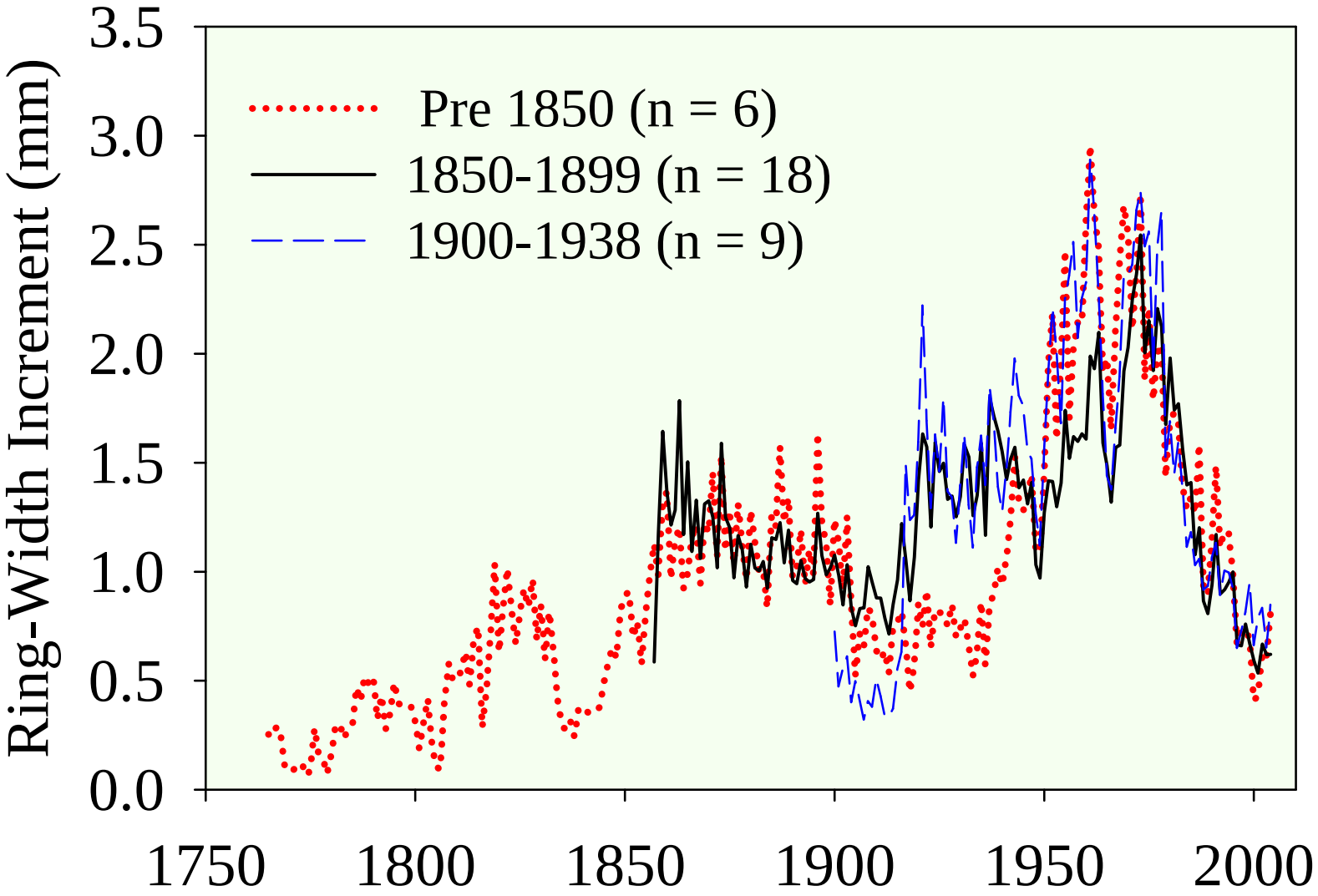
Soil-Stream Water Relations



Soil-Stream Water Relations



Adirondack Sugar Maple Growth Trends



Summary

1. Weak recovery in stream chemistry.
2. Accumulating evidence of base depletion in soils.
3. Oa horizon is a more important control of stream chemistry than the B horizon.
4. Developing evidence links decreases in soil bases and tree growth.