Hiking through Ecotrends

Collecting data without getting your feet wet

Mary McKenna
Howard University
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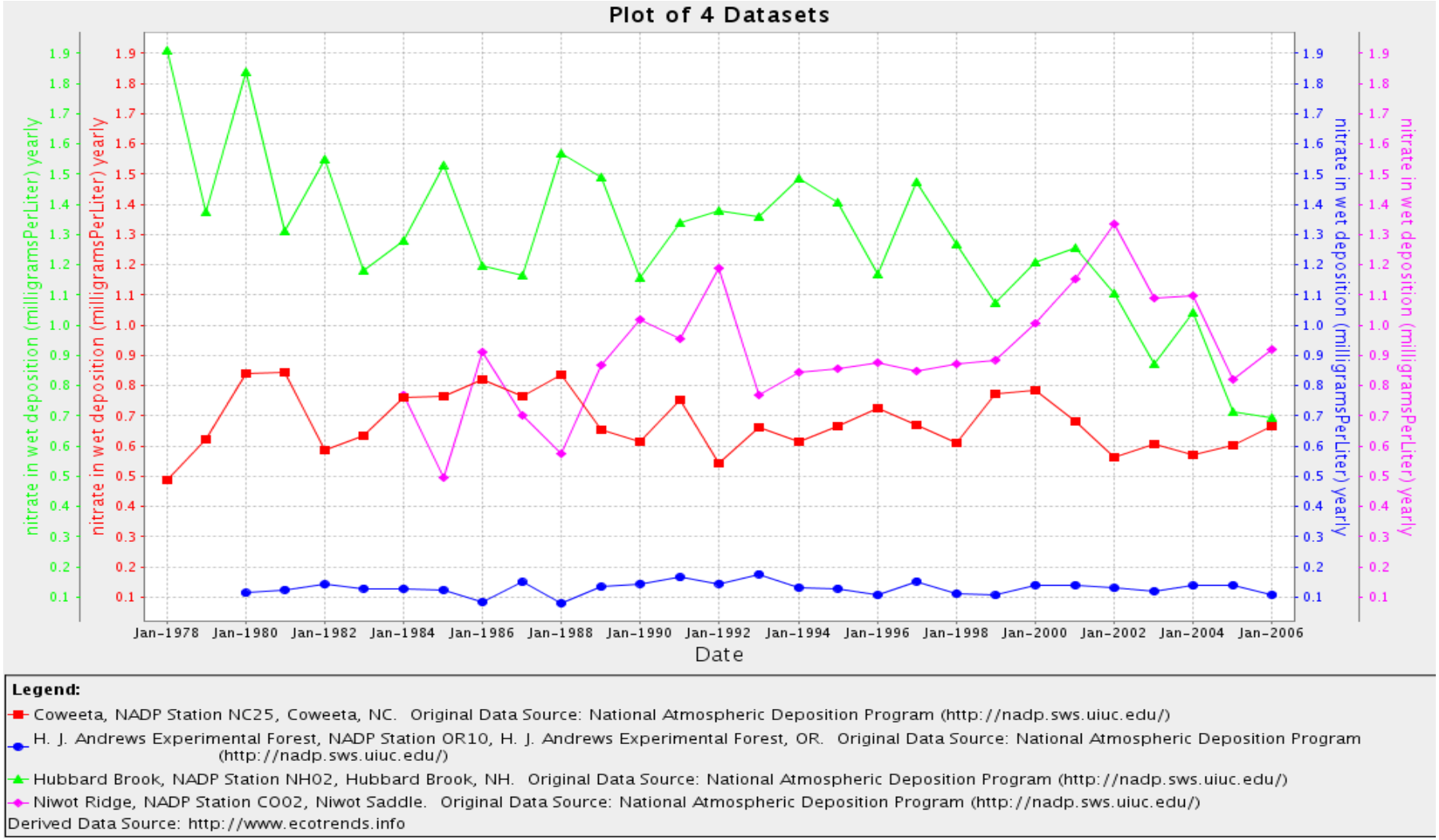
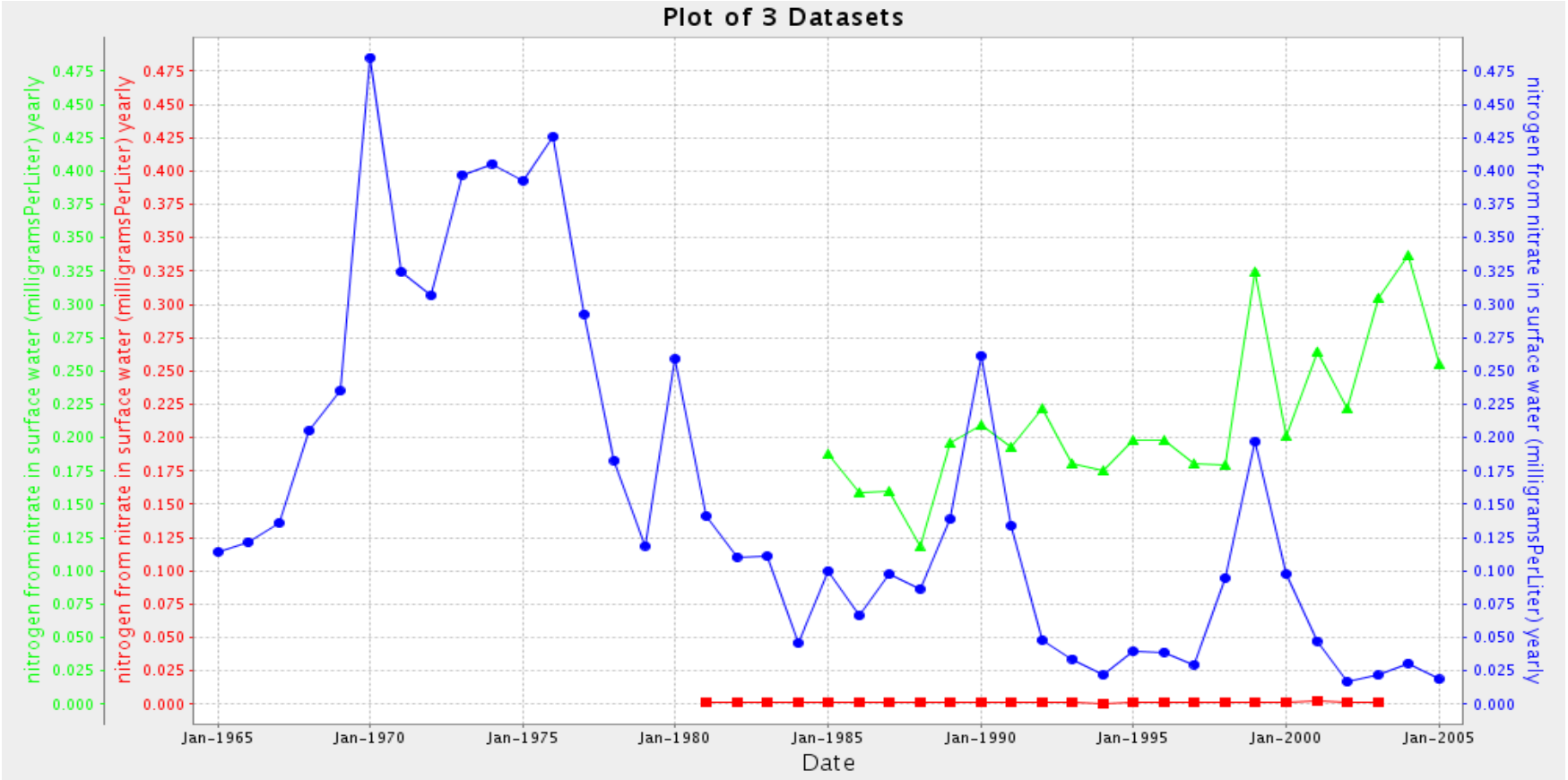
Hypotheses

- Increase in N input (rain) and output (surface water) over time
- Decrease in S input (rain) and output (surface water) over time
- Positive relationship between N,S input and output
- Negative relationship between N, S input and rainfall pH
- Variation in response in East and West USA

Nitrate Deposition at 4 Sites



Nitrate in Surface Water- 3 sites



Legend:

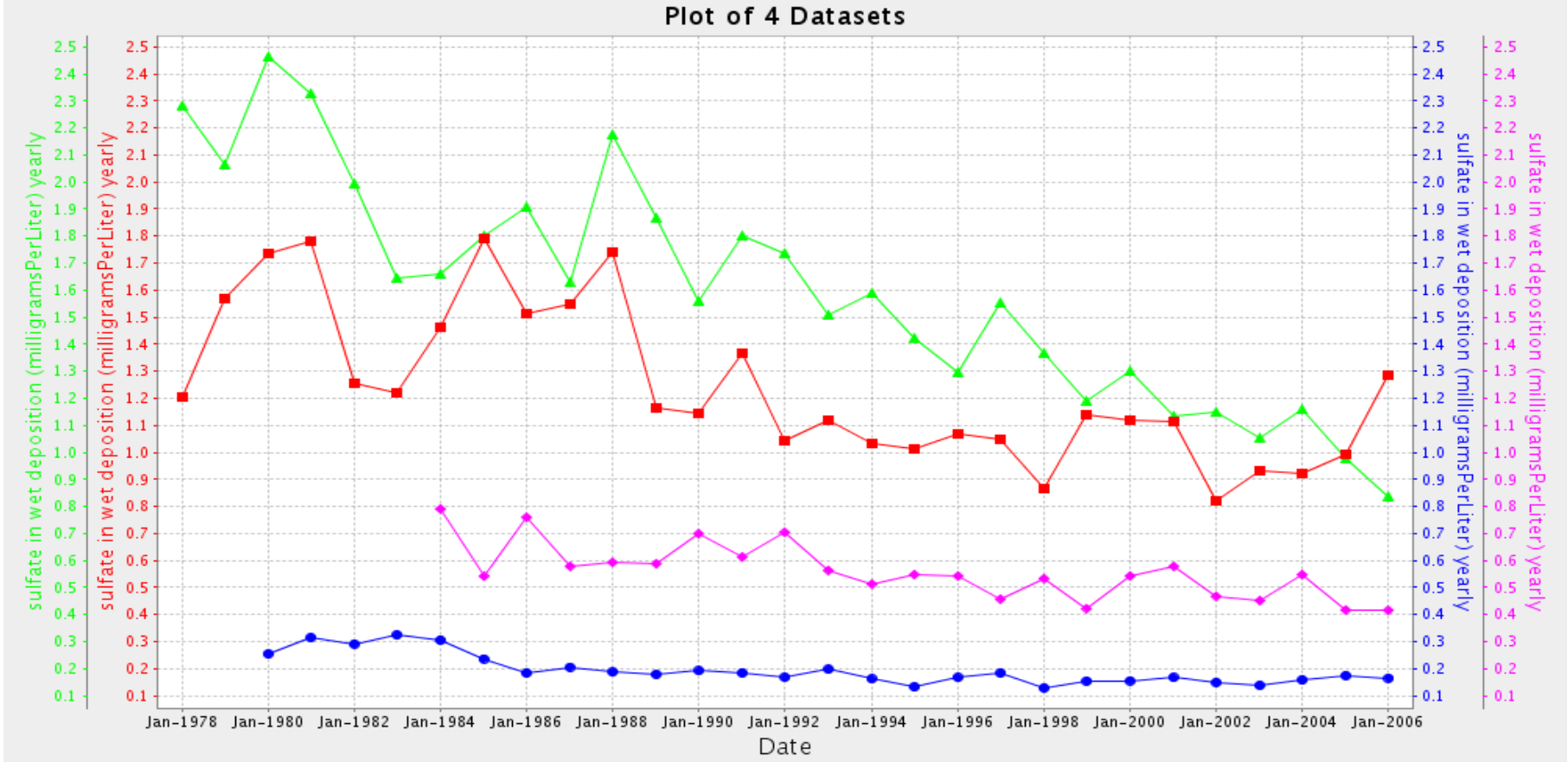
H. J. Andrews Experimental Forest, Hydrologic Gauging Station Watershed 2. Original Data Source: Craig Creel, Cameron Jones, Julia Jones, Mark Harmon, Frederick Swanson, Greg Downing, Kristin Vanderbilt, Stan Gregory, Sherri Johnson, Kate Lajtha, Donald Henshaw, H. J. Andrews Experimental Forest (http://www.fsl.orst.edu/lterhome.html/)

Hubbard Brook, Watershed 6 of Hubbard Brook. Original Data Source: Gene Likens, Hubbard Brook (http://www.hubbardbrook.org/)

Niwot Ridge, Green Lake 4. Original Data Source: Nel Caine, Niwot Ridge (http://culter.colorado.edu/NWT/)

Derived Data Source: http://www.ecotrends.info

Sulfate Deposition at 4 Sites

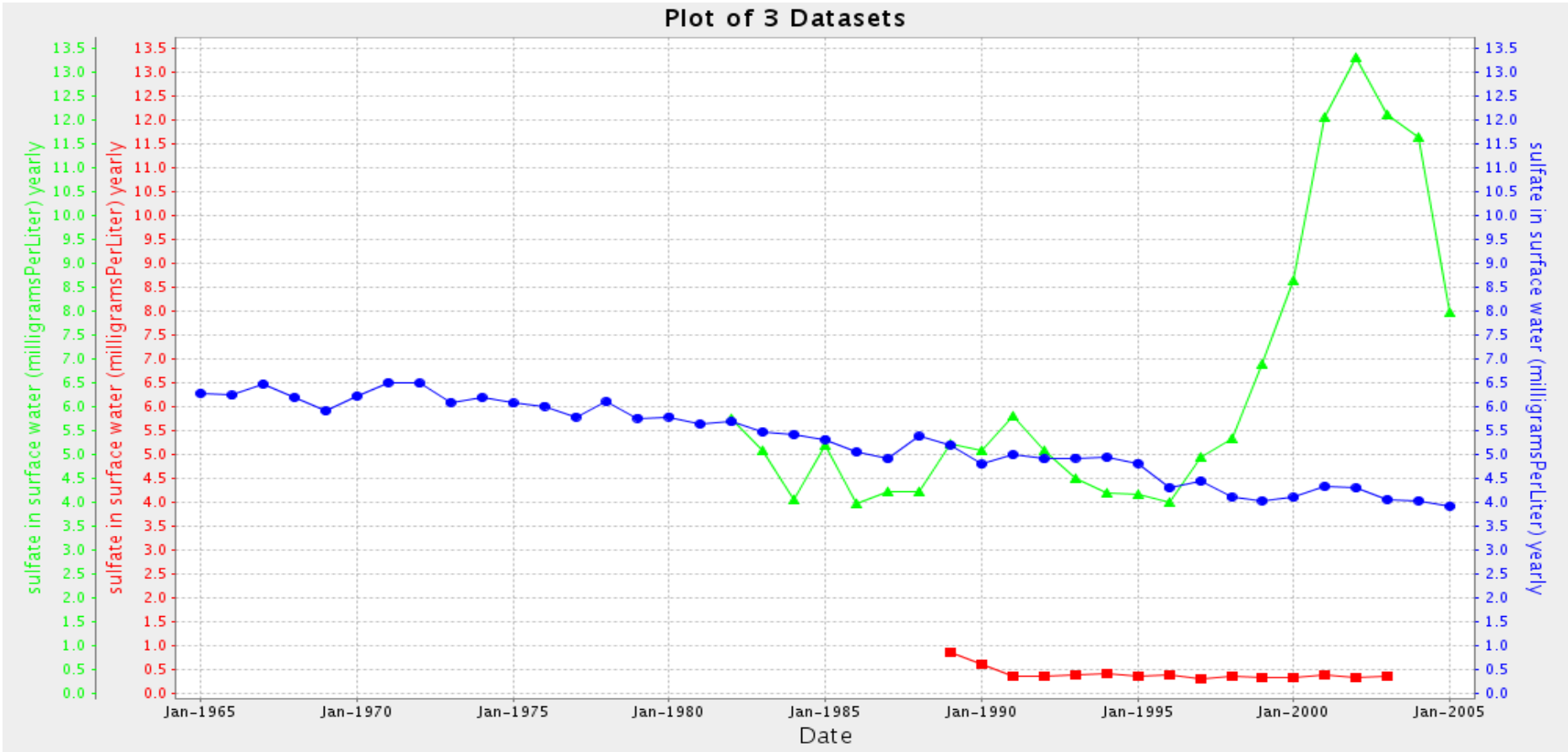


Legend:

- Coweeta, NADP Station NC25, Coweeta, NC. Original Data Source: National Atmospheric Deposition Program (http://nadp.sws.uiuc.edu/)
- H. J. Andrews Experimental Forest, NADP Station OR10, H. J. Andrews Experimental Forest, OR. Original Data Source: National Atmospheric Deposition Program (http://nadp.sws.uiuc.edu/)
- Hubbard Brook, NADP Station NH02, Hubbard Brook, NH. Original Data Source: National Atmospheric Deposition Program (http://nadp.sws.uiuc.edu/)
- Niwot Ridge, NADP Station CO02, Niwot Saddle. Original Data Source: National Atmospheric Deposition Program (http://nadp.sws.uiuc.edu/)

Derived Data Source: http://www.ecotrends.info

Sulfate in Water- 3 sites



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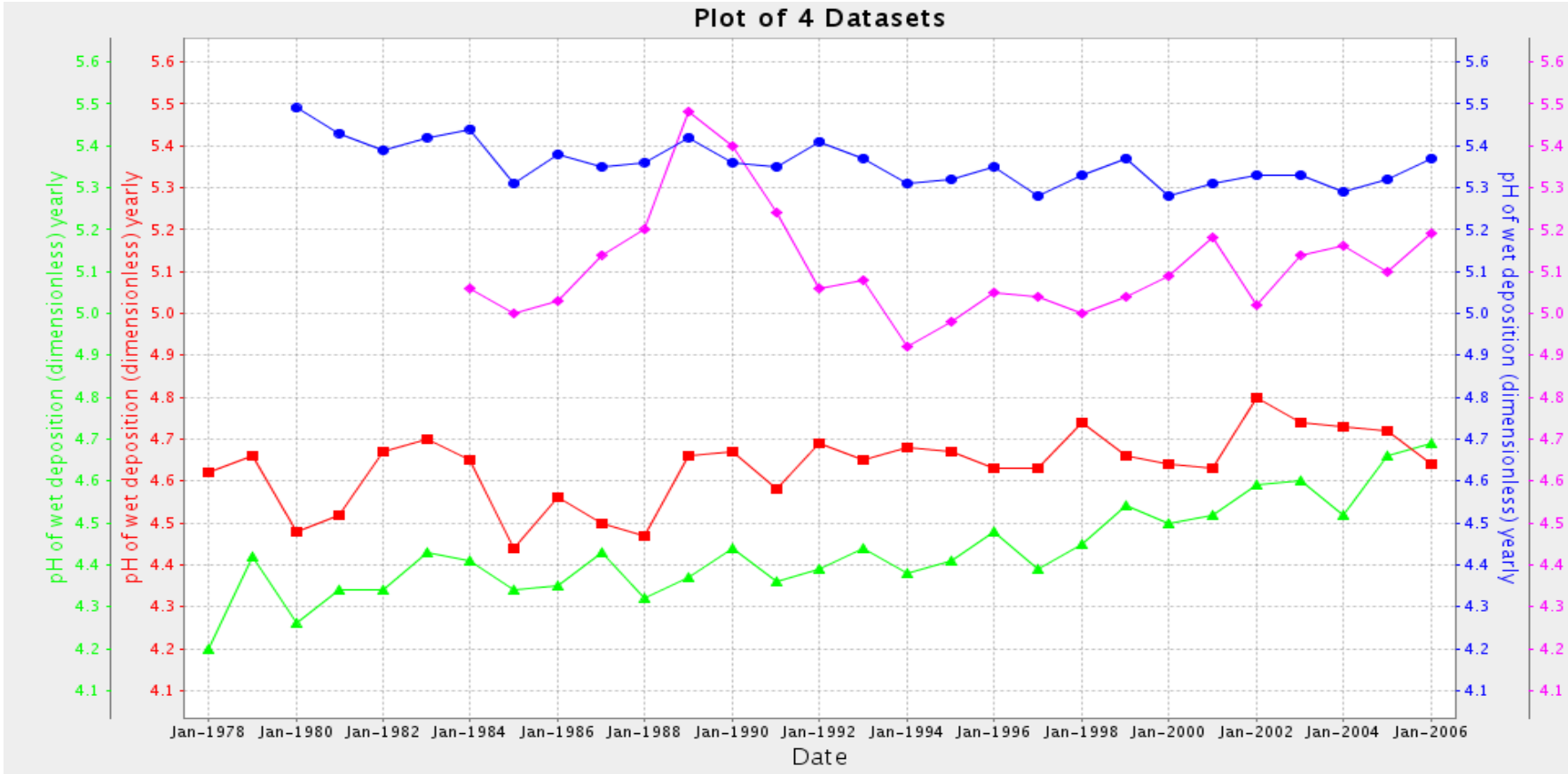
Rain pH at 4 sites



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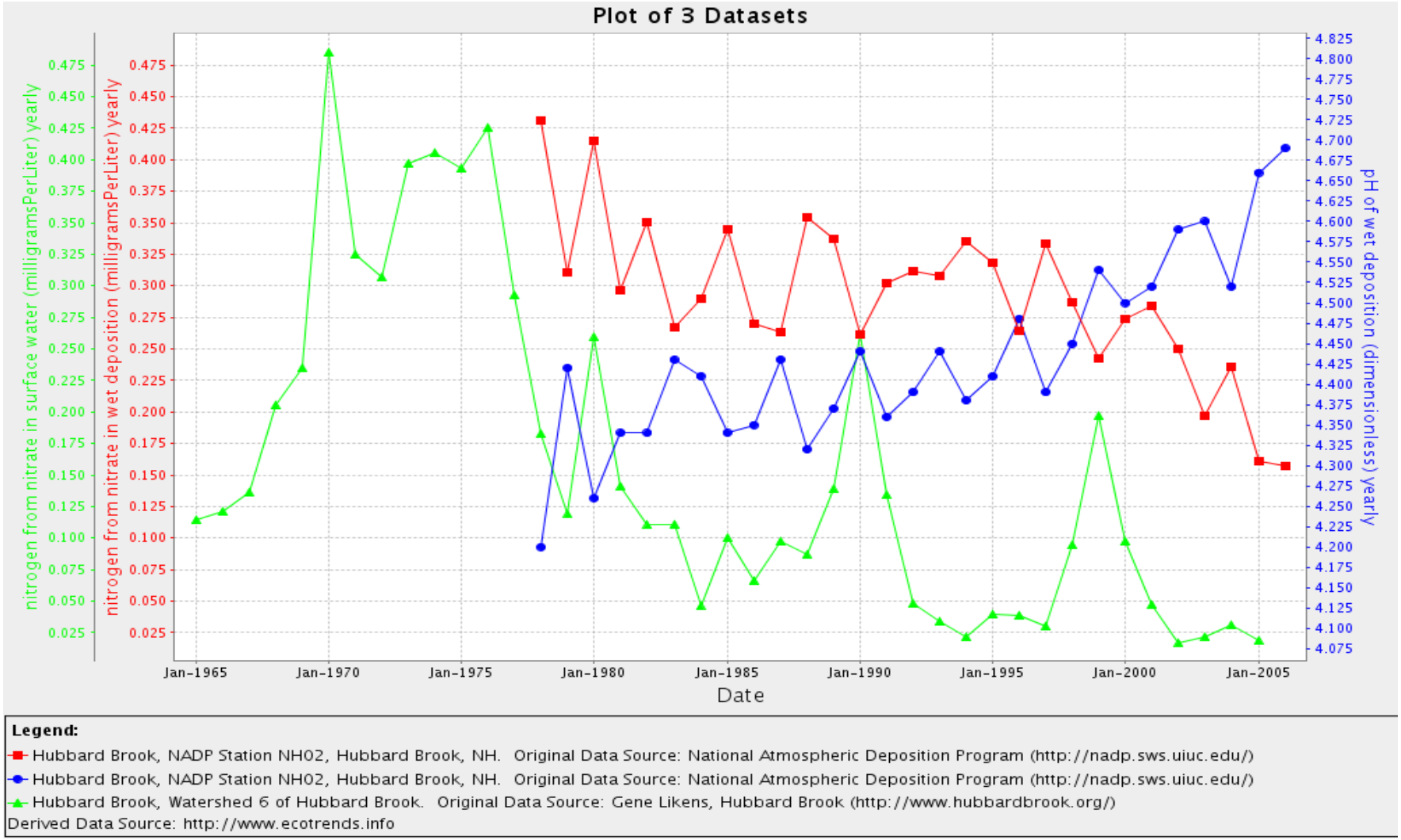
Patterns Observed Across Sites

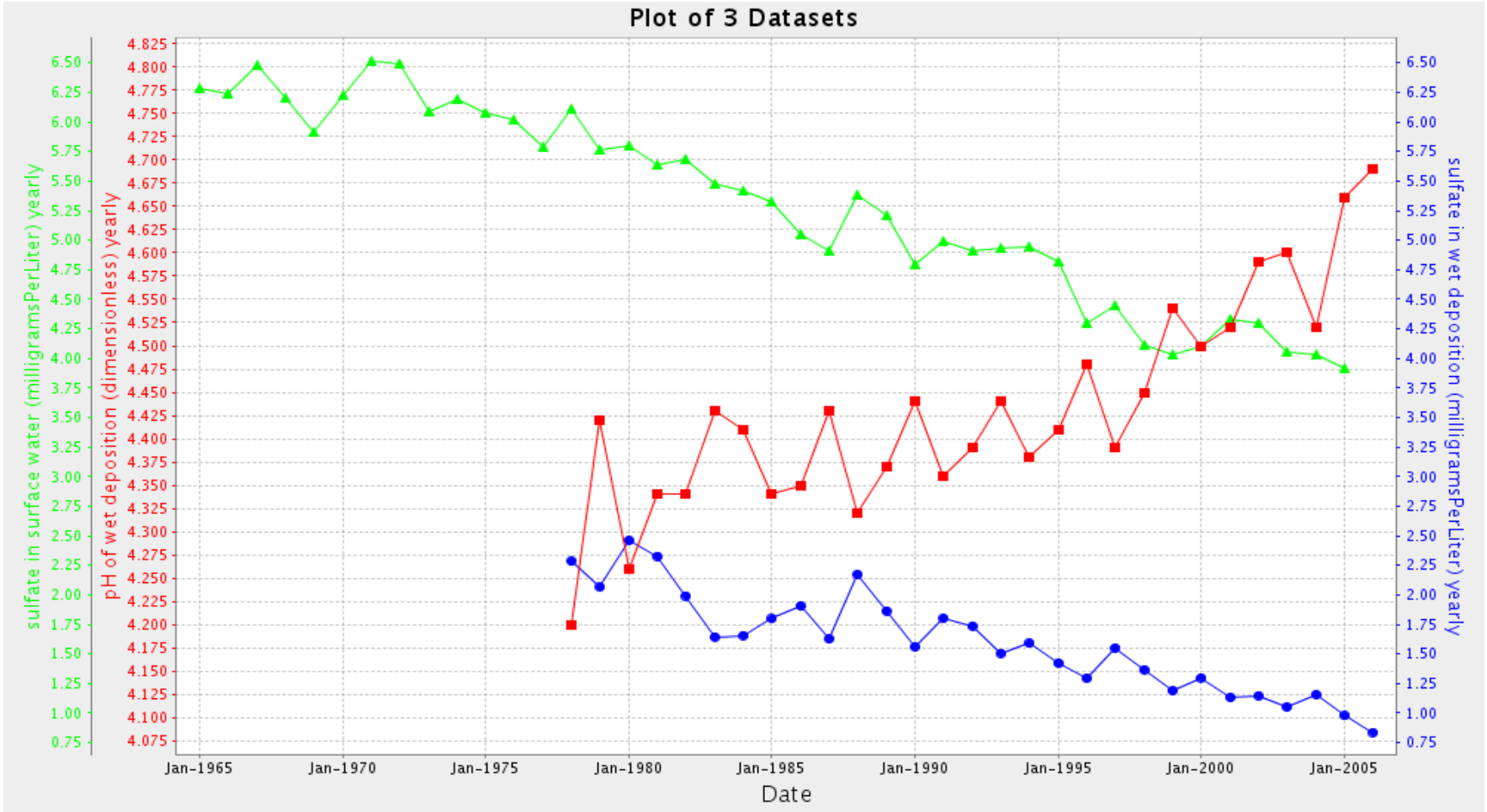
- Hubbard Brook (east): High nitrate and sulfate, decreasing input/output, increasing pH → **hypotheses generally supported?**

- Niwot Ridge (west): high nitrate, increasing N input/output; input S low and decreasing; output S varies -increase/ decrease (1997-2005), pH high and steady → **hypotheses not well supported?**

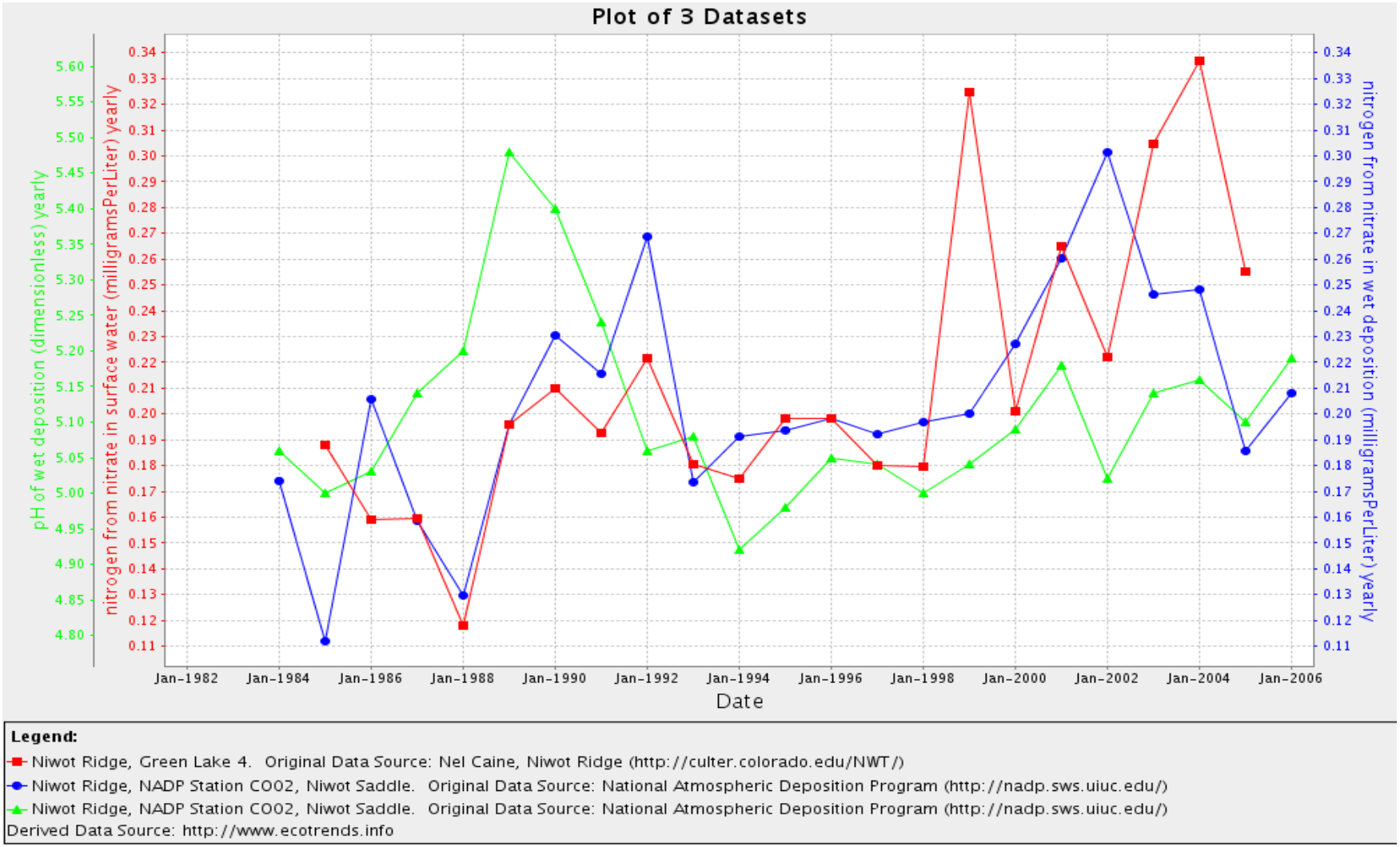
Hubbard Brook: Rain N, pH; N in water



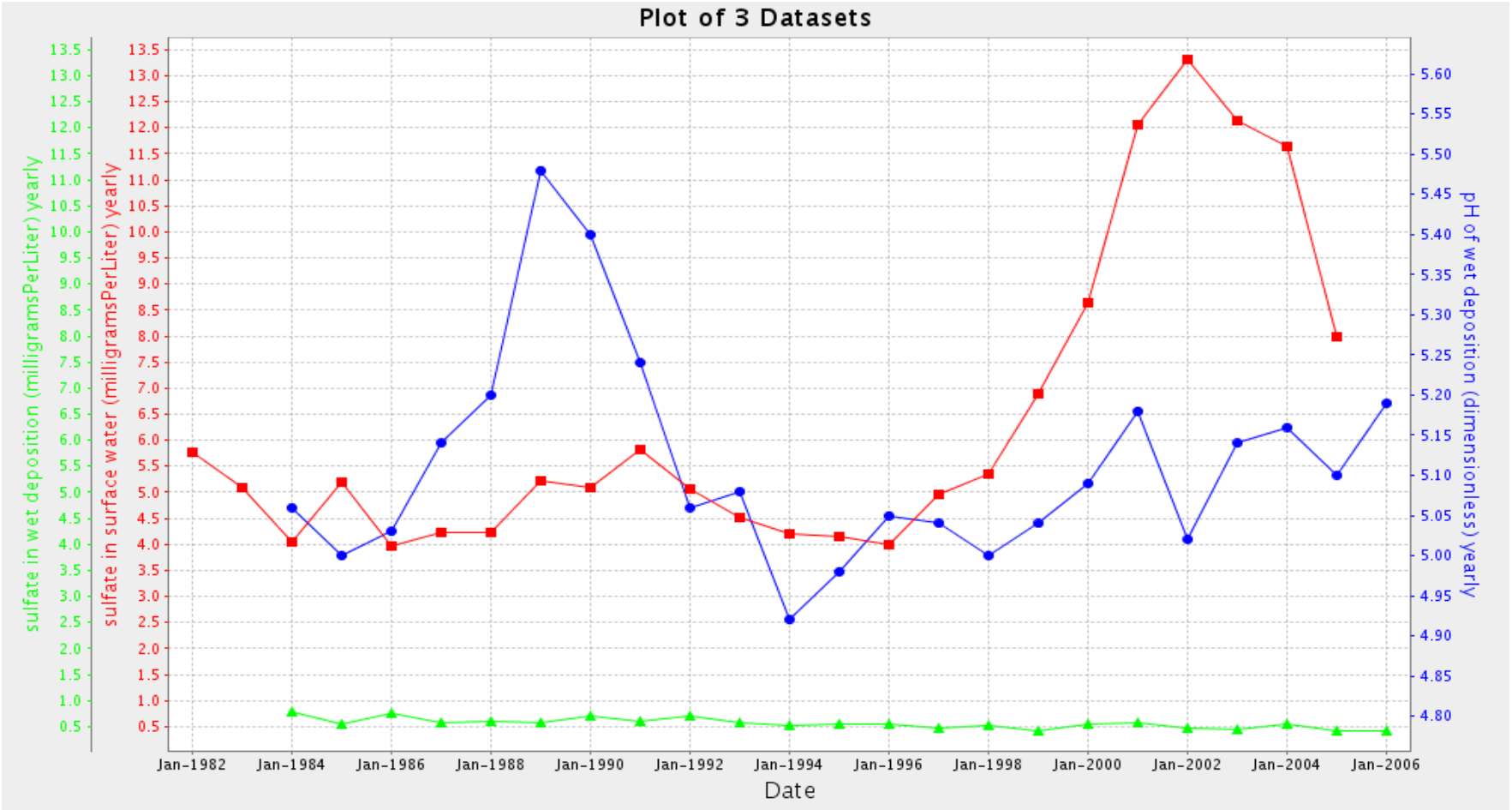
Hubbard Brook: Rain sulfate, pH; sulfate in water



Niwot Ridge: Rain N, pH; N in water



Niwot Ridge: Rain sulfate, pH; sulfate in water



Patterns Observed within Sites

- Hubbard Brook:
  - N and S input negatively related to pH values?
  - N input not related to N in water?
  - S input positively related to S in water?

- Niwot Ridge:
  - N and S input not related to pH values?
  - N input positively related to N in water?
  - S input not related to S in water?

Further Directions for Students

- Statistical analysis of values, trends
- Factors that explain differences in patterns observed in eastern, western watersheds
- Factors that influence retention and release of N and S from watersheds
- Relative contribution of anthropogenic *vs* natural sources of N in outputs from watersheds

Process-Reflection- Ecotrends

- Identify question – can use list of Ecotrends variables– frame a hypothesis about relationships
- Site selection – relatively easy using site websites (but helps to have advance info here) – some site info missing
- Variable selection- simple comparisons best
- Get site overview first- compare single variables across sites – helps to determine most interesting site groupings for analysis

Potential issues for students

- Line colors for sites, variables change between plots based on order in list
- Need to be consistent with units requested
- Multiple measures available for N input
  - Need to identify specific measure(s)
- Seasonal and episodic acidification is not shown in yearly averages – finer scale comparison tried (monthly) –datasets not returned