

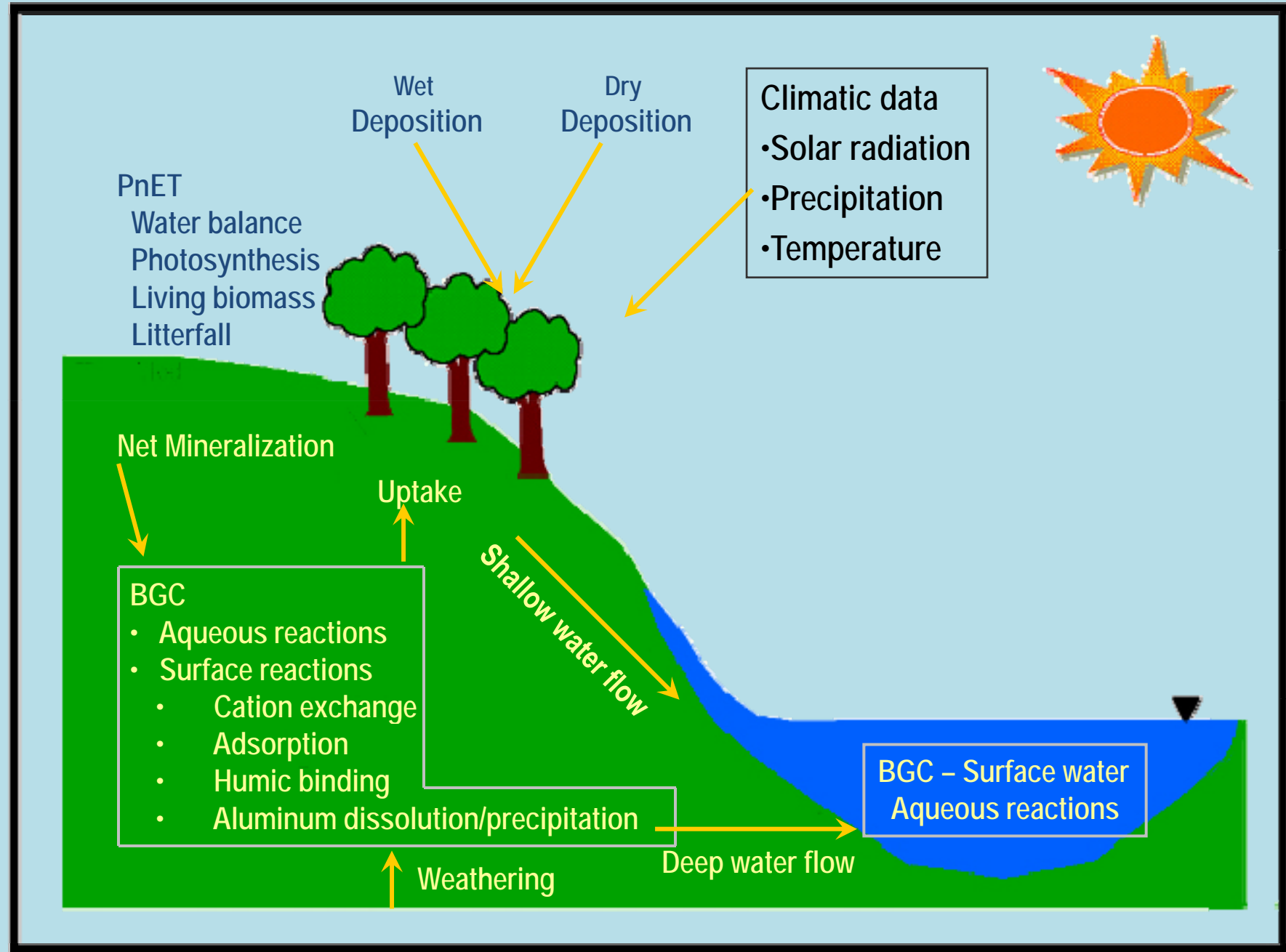
# Establishing a Soil Chemical Baseline for the Catskills

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Dept. of Civil & Environmental Engineering  
Syracuse University

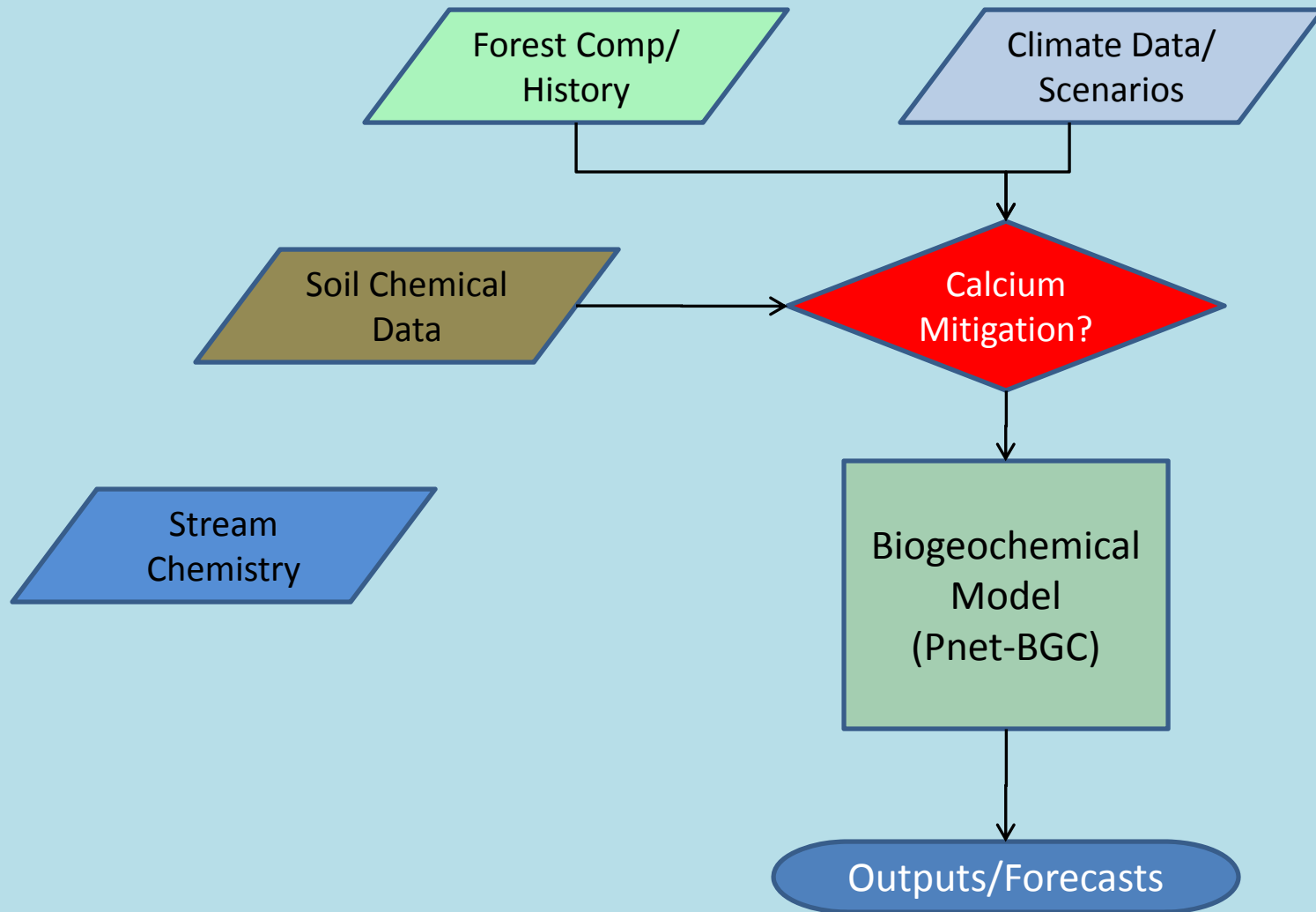
# Response of Acidified Soils and Associated Surface Waters to Reduced Atmospheric Acid Inputs and Calcium Mitigation Strategies

- New Project – April 2010
  - How is soil chemical change linked to stream and lake responses to acidic deposition?
  - Are existing soil chemical data sufficient to adequately track future soil change?
  - Have applications of Ca to soils been effective in increasing the long-term base status of forest soils and drainage waters?
  - Which Ca mitigation strategies hold the most promise for accelerating the chemical recovery of soils and surface waters in the Adirondacks?

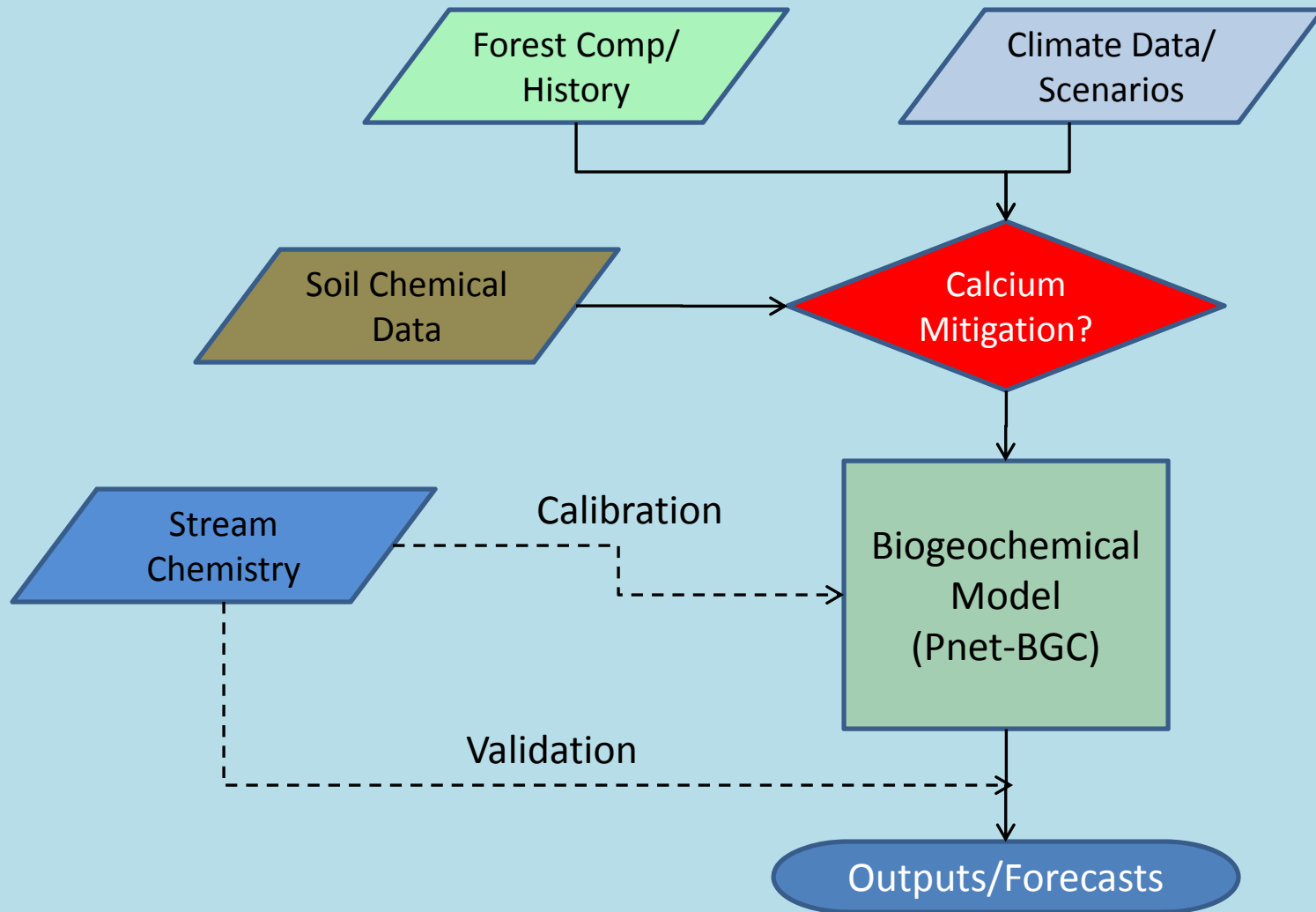




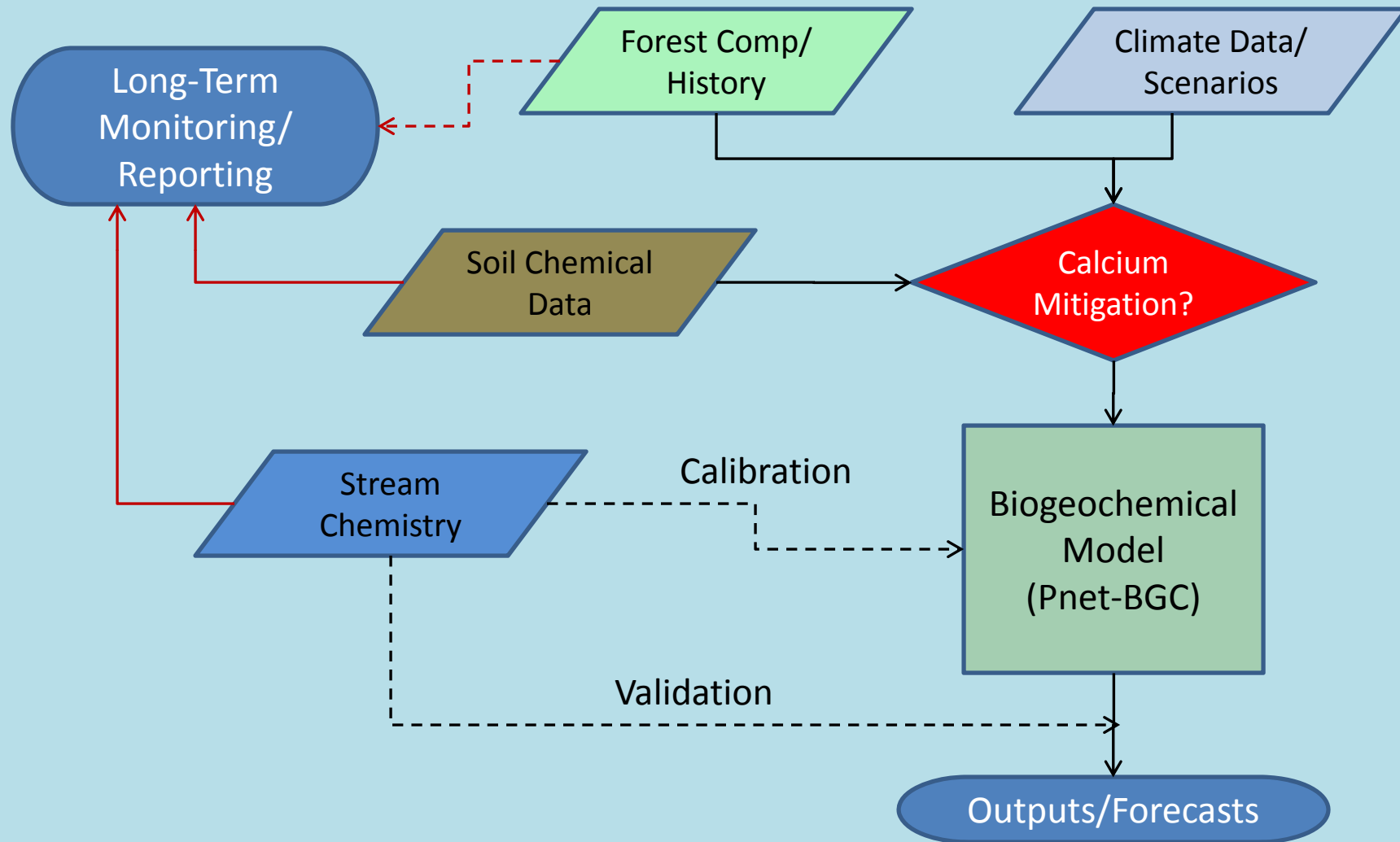
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- Proposed Field and Laboratory Work

- Chemical analysis of mineral soil samples collected at 130 sites in NE USA in 2001-02, comparison with 1984 data.
- Monthly sampling and analysis of 12 (or more) Catskills stream sites selected from sites in Lovett et al. (2000) study.
- Bi-monthly sampling and analysis of inlet streams to six Adirondack lakes.
- Soil sampling and analysis from experimentally manipulated sites in the Adirondacks.
- Soil sampling and analysis from 25 Catskills watersheds to establish a soil monitoring baseline for future studies

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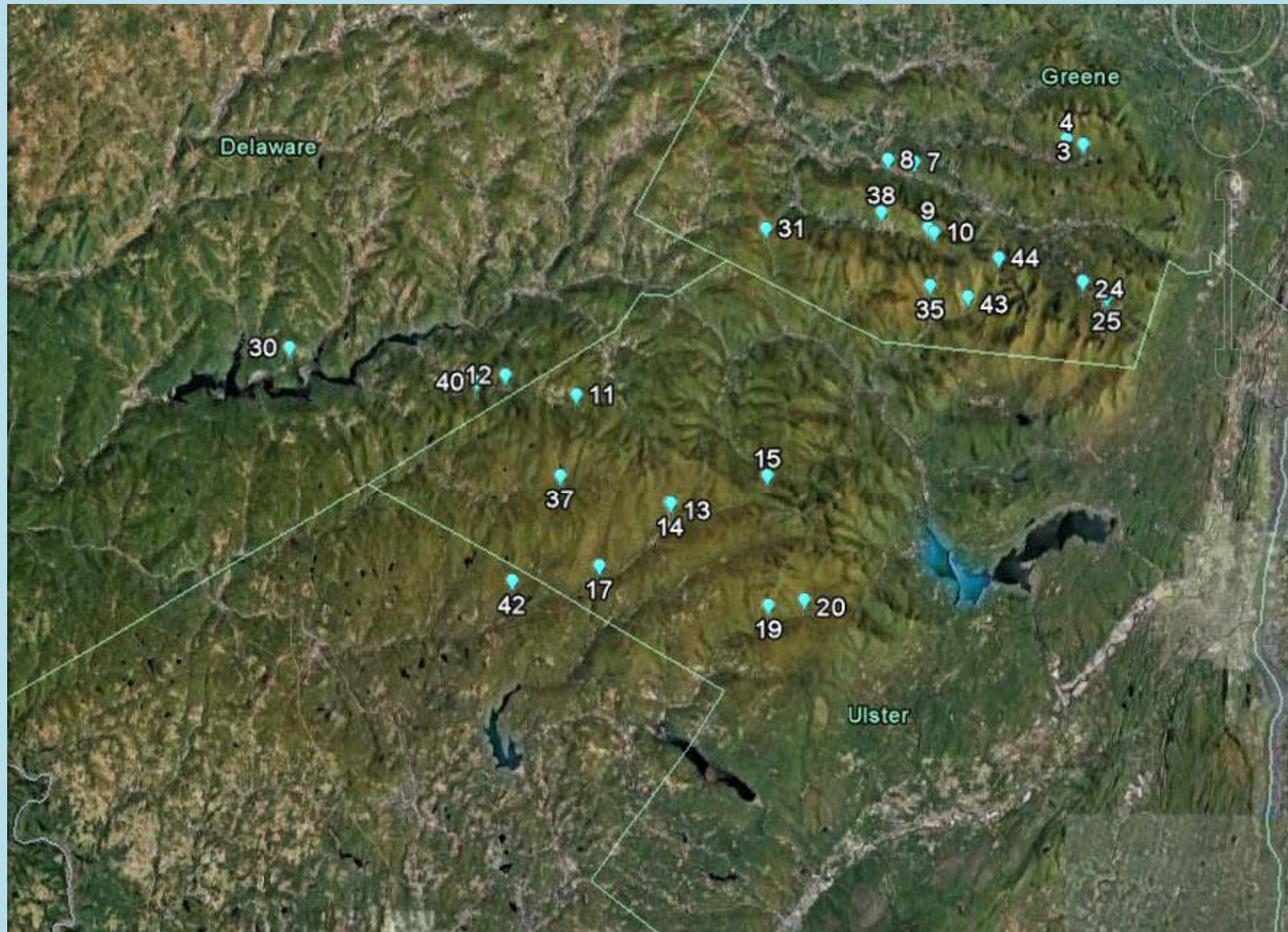
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# Catskills Study Watersheds



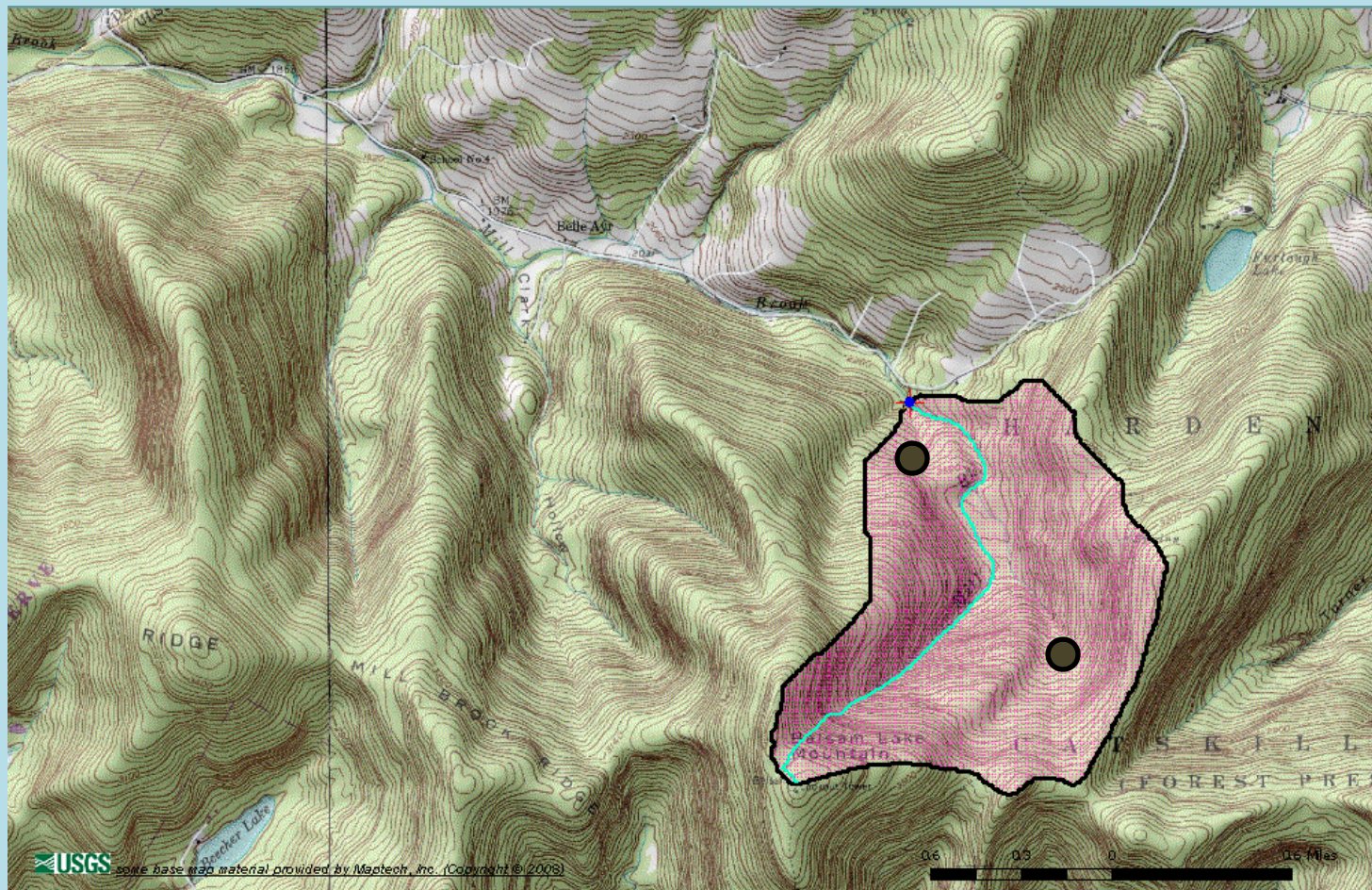
# Goals of Soil Sampling

1. Establish a baseline for future monitoring.
2. Provide data for biogeochemical modeling.
  - $\approx 50$  pits [25 watersheds x 2 pits]
    - Sample sites that actually have soil (!)
    - Sample range of forest types
    - State land – low probability of land-use change



# Site Locations

- In each watershed:
  - One site near stream sampling location.
  - One site at elevation approximately half-way between stream sampling site and watershed crest.





# Methods

- Quantitative soil pits
  - Direct measurement of soil mass ( $\text{kg m}^{-2}$ )
  - Calculate soil chemical pools
  - $O_i+O_e$ ,  $O_a$
  - Mineral soil by depth increment: 0-5 cm, 5-10, 10-20, 20-C

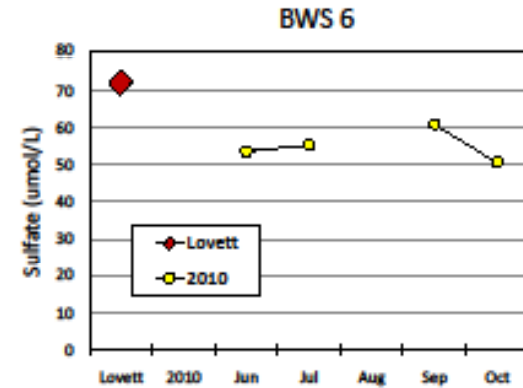
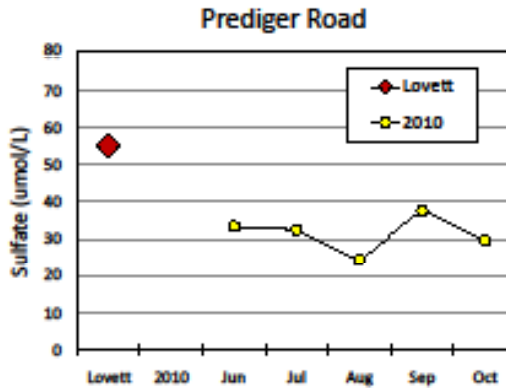
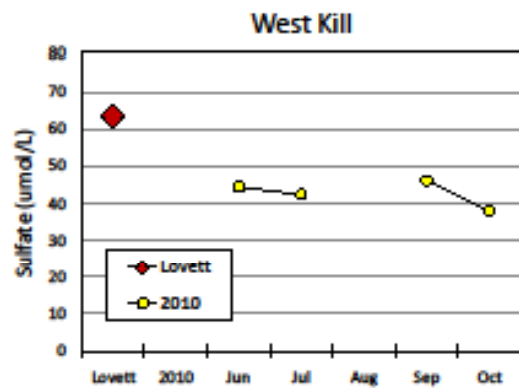
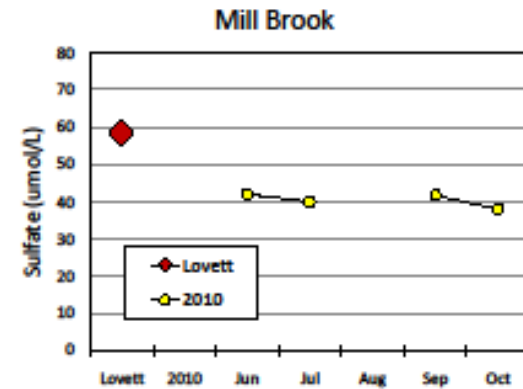
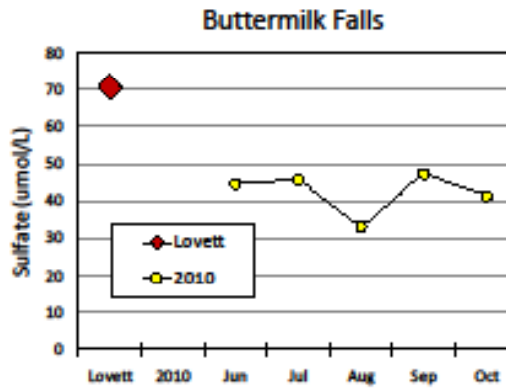
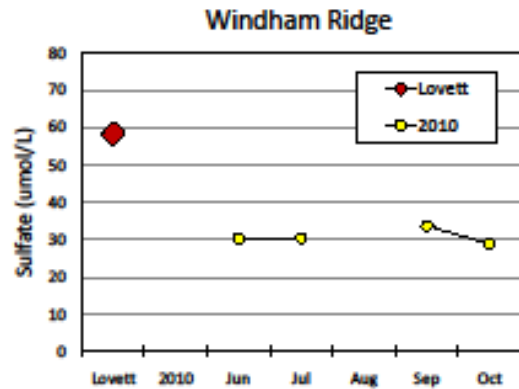


# Analysis and Storage

- Analytes:
  - Total C, N (Combustion/GC)
  - Soil pH
  - Exchangeable Al, Ca, Mg, K, Na ( $\text{NH}_4\text{Cl}$  extraction)
  - Exchangeable Acidity (KCl extraction)
  - Cation Exchange Capacity
- Archiving Options?



# Stream Sulfate Concentrations



# Stream Calcium Concentrations

