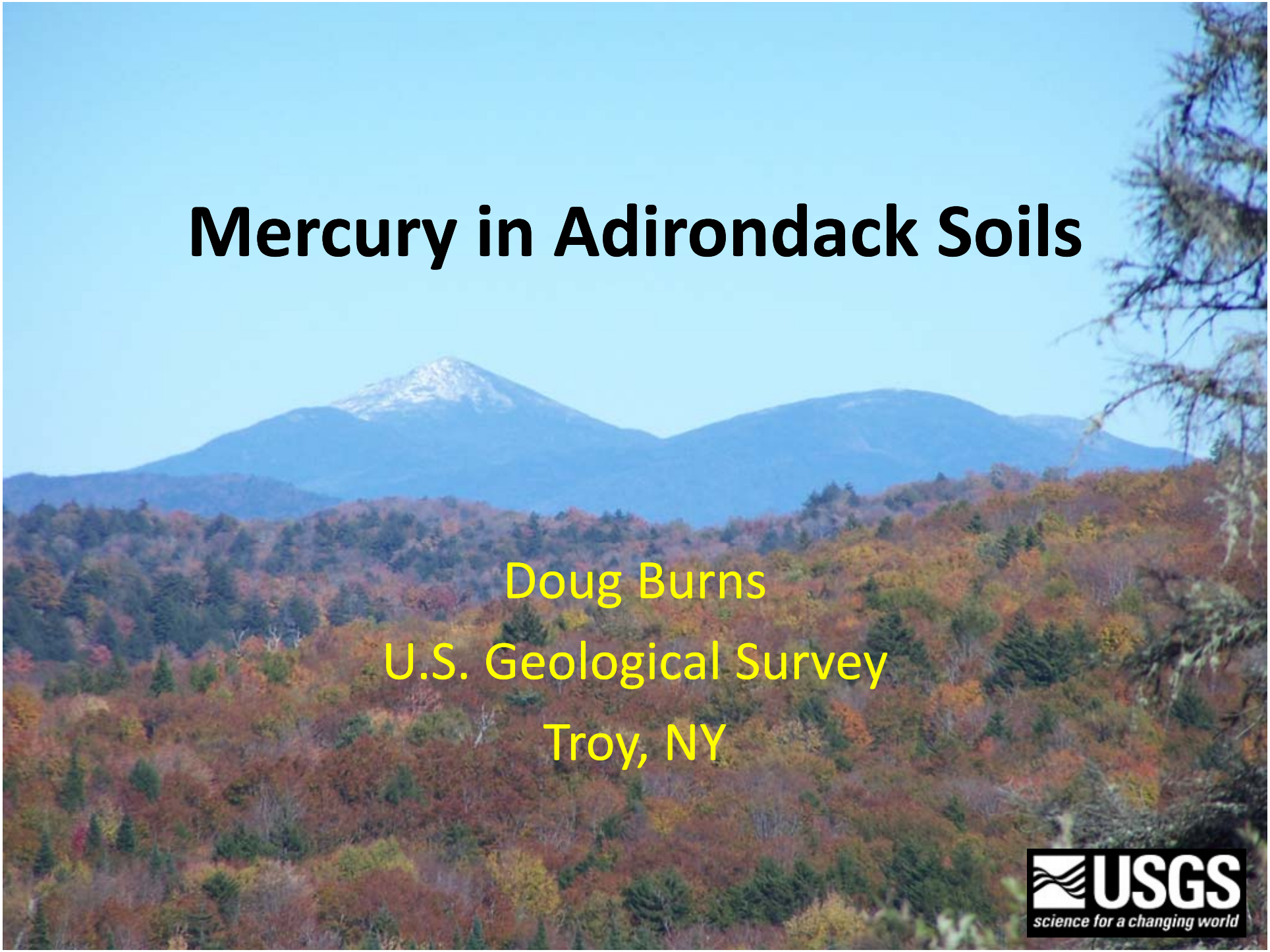

Mercury in Adirondack Soils

Doug Burns
U.S. Geological Survey
Troy, NY

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Mercury in Soils

- Largest pool of Hg in most forested ecosystems
- Most studies show that inputs of Hg from atmospheric deposition exceed outputs in surface waters plus net emissions
- Hg strongly associated with soil organic matter – binds to thiol groups
- Hg in soils is new, old, and recycled

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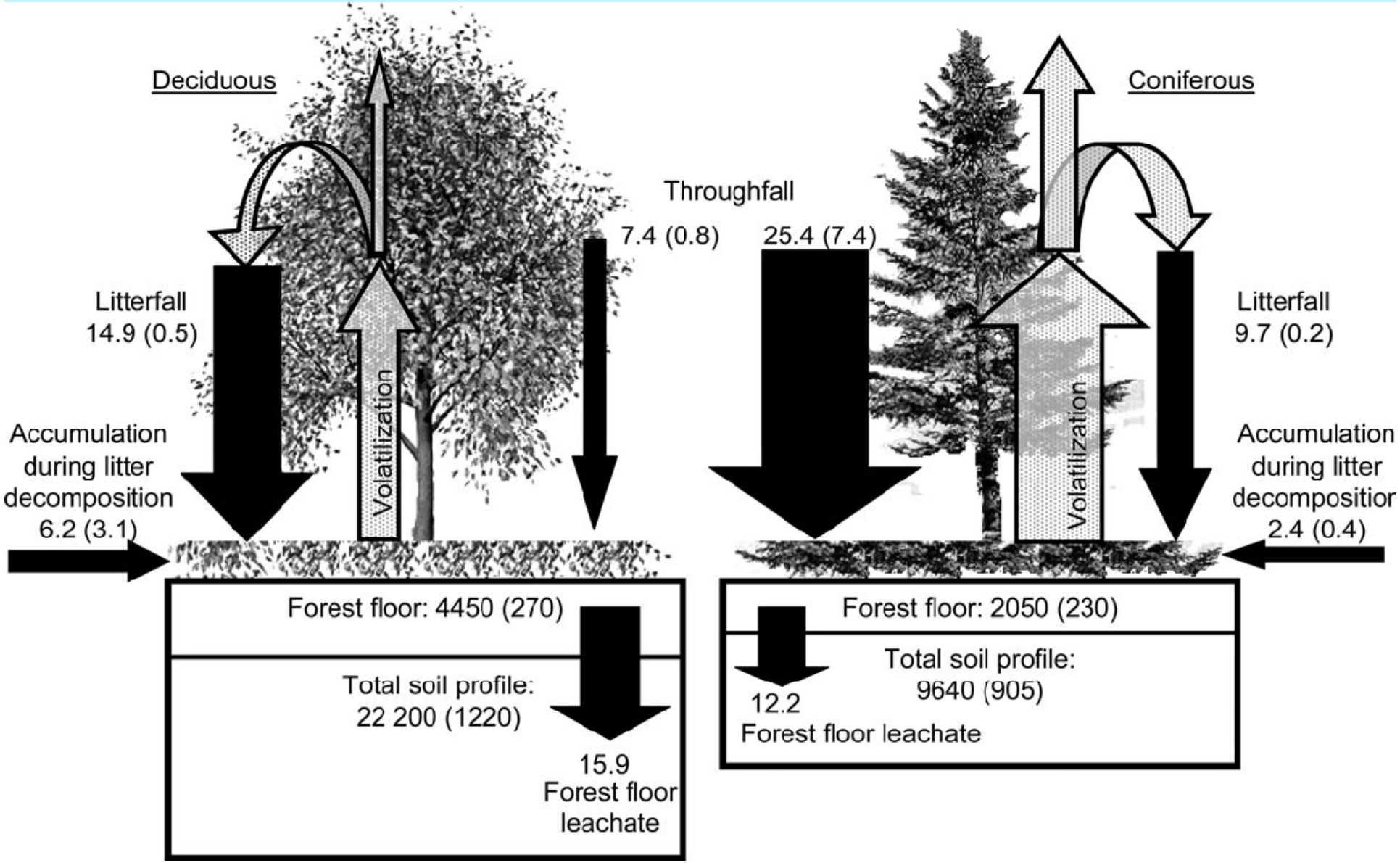
Hg Cycle in ADKs from Demers et al., 2007



Important Questions in Hg Research that Require Soils Data

- Is Hg still showing net accumulation in ecosystems/watersheds?
- Relative roles of aquatic vs. non-aquatic methyl Hg sources
- What are the trends in Hg inputs, outputs, and stores?
- Time frame for recovery from decreasing Hg deposition

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Soil Sampling in ADKs

- Collected samples in different land cover, multiple depths
- Analyzed for total Hg and methyl Hg
- Also analyzed two sets of samples from Heimburger plots near Newcomb – 1984 and 2006
- Part of effort to model Hg cycle in two watersheds: (1) Fishing Bk, NY, (2) McTier Ck, SC

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Upper Hudson Basin Upstream of Newcomb, NY

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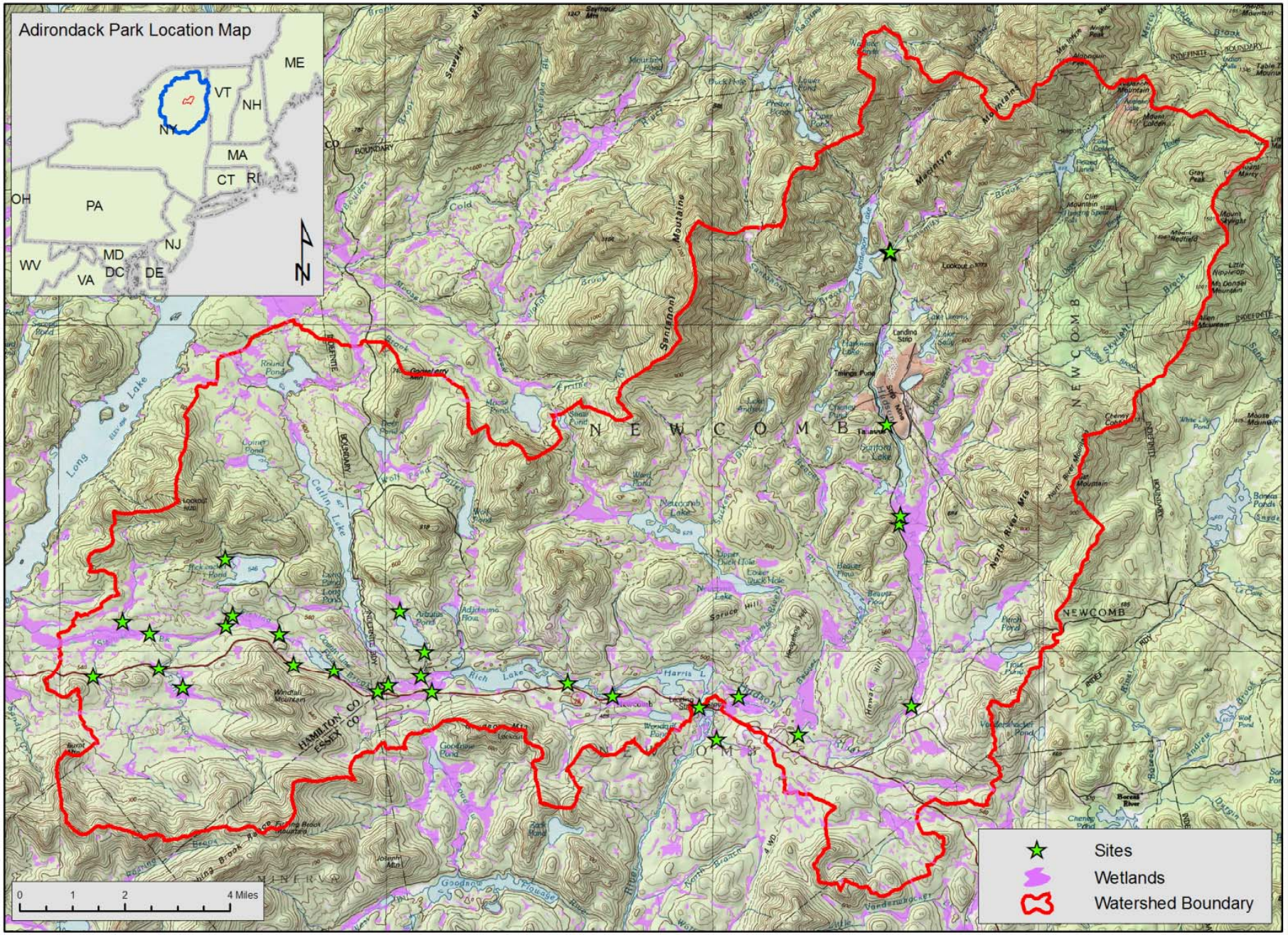
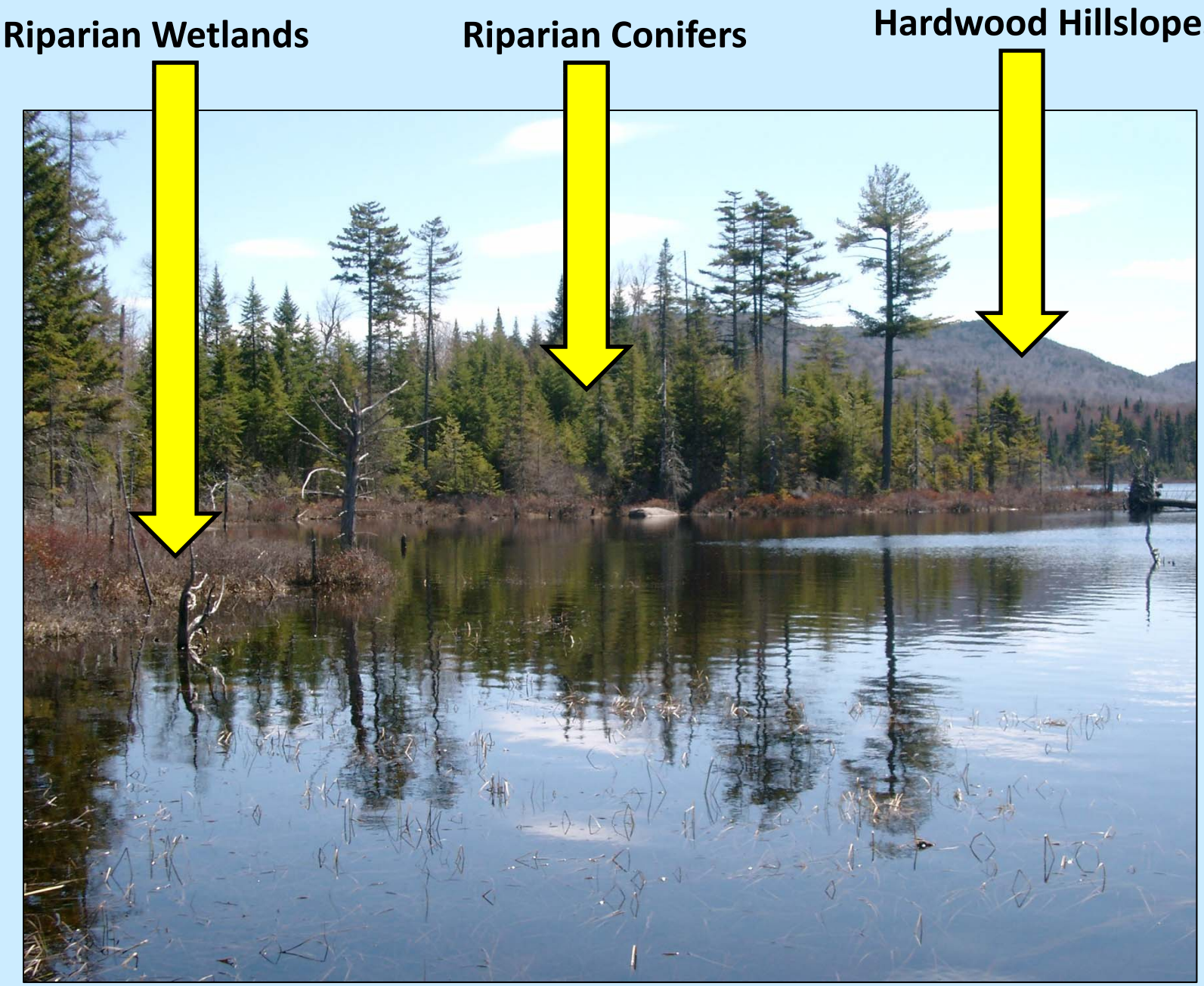
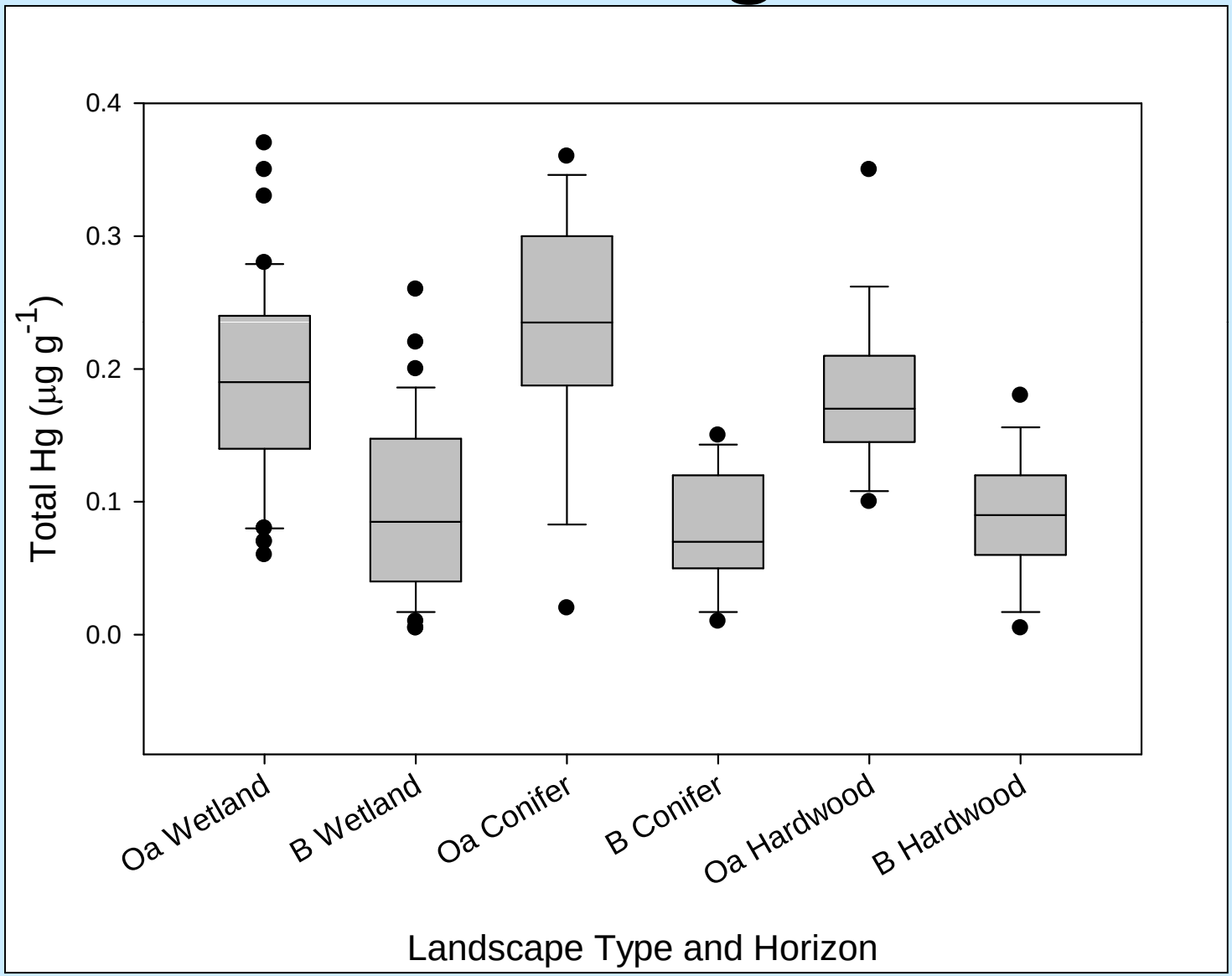
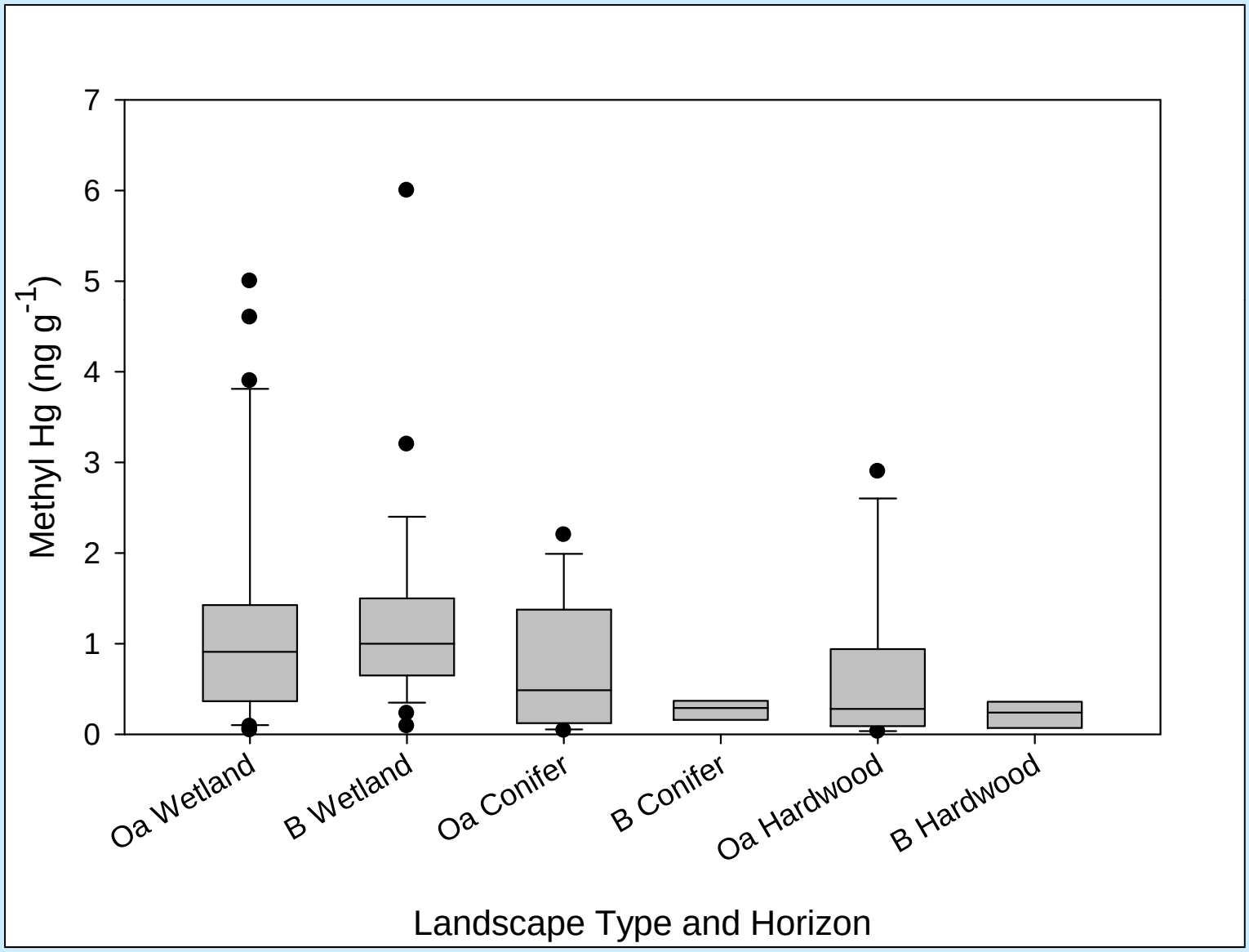



Riparian Wetlands
Riparian Conifers
Hardwood Hillslopes

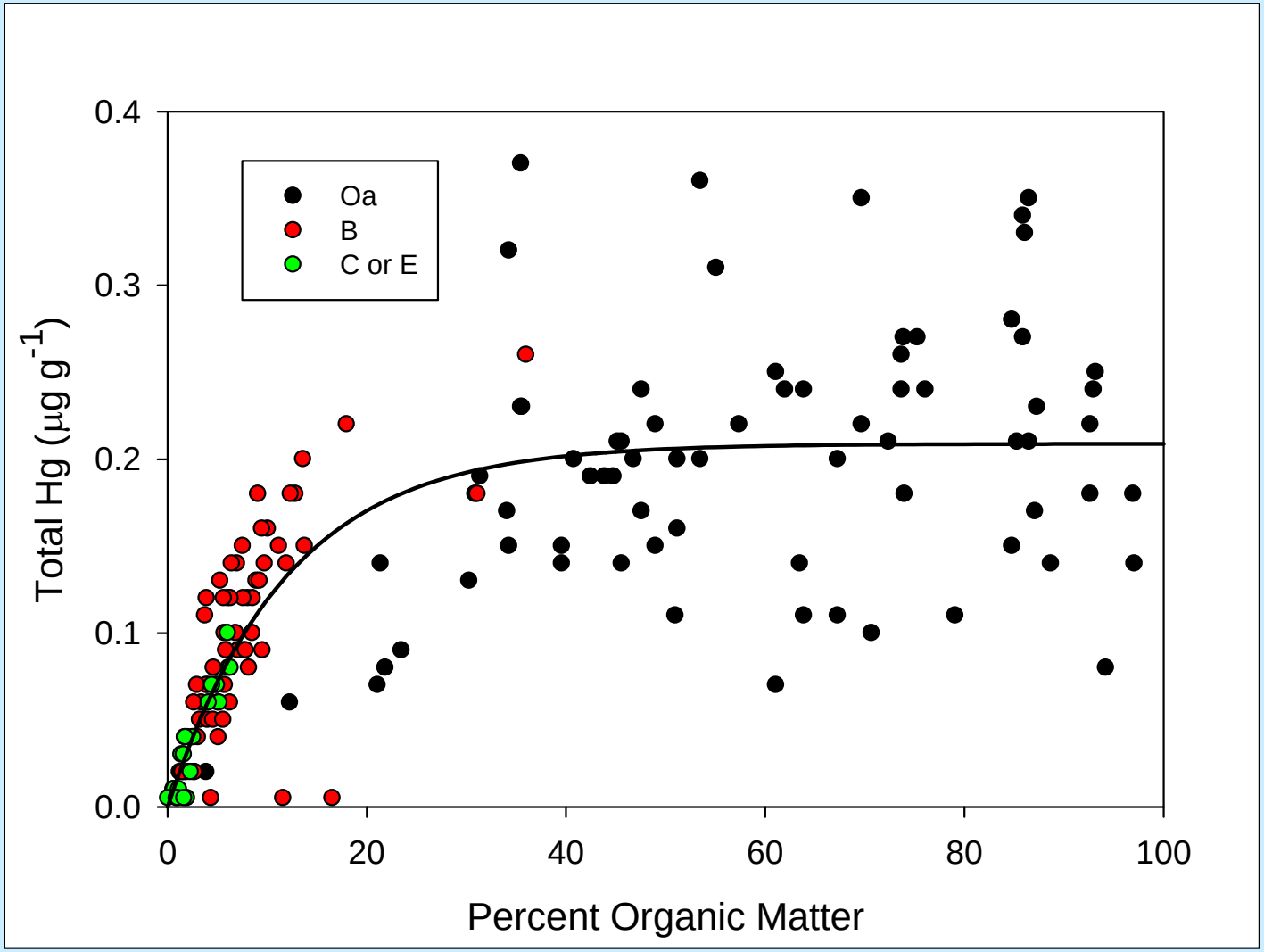
Total Hg


0.4
0.3
0.2
0.1
0.0
Total Hg (µg g-1)
Oa Wetland
B Wetland
Oa Conifer
B Conifer
Oa Hardwood
B Hardwood
Landscape Type and Horizon

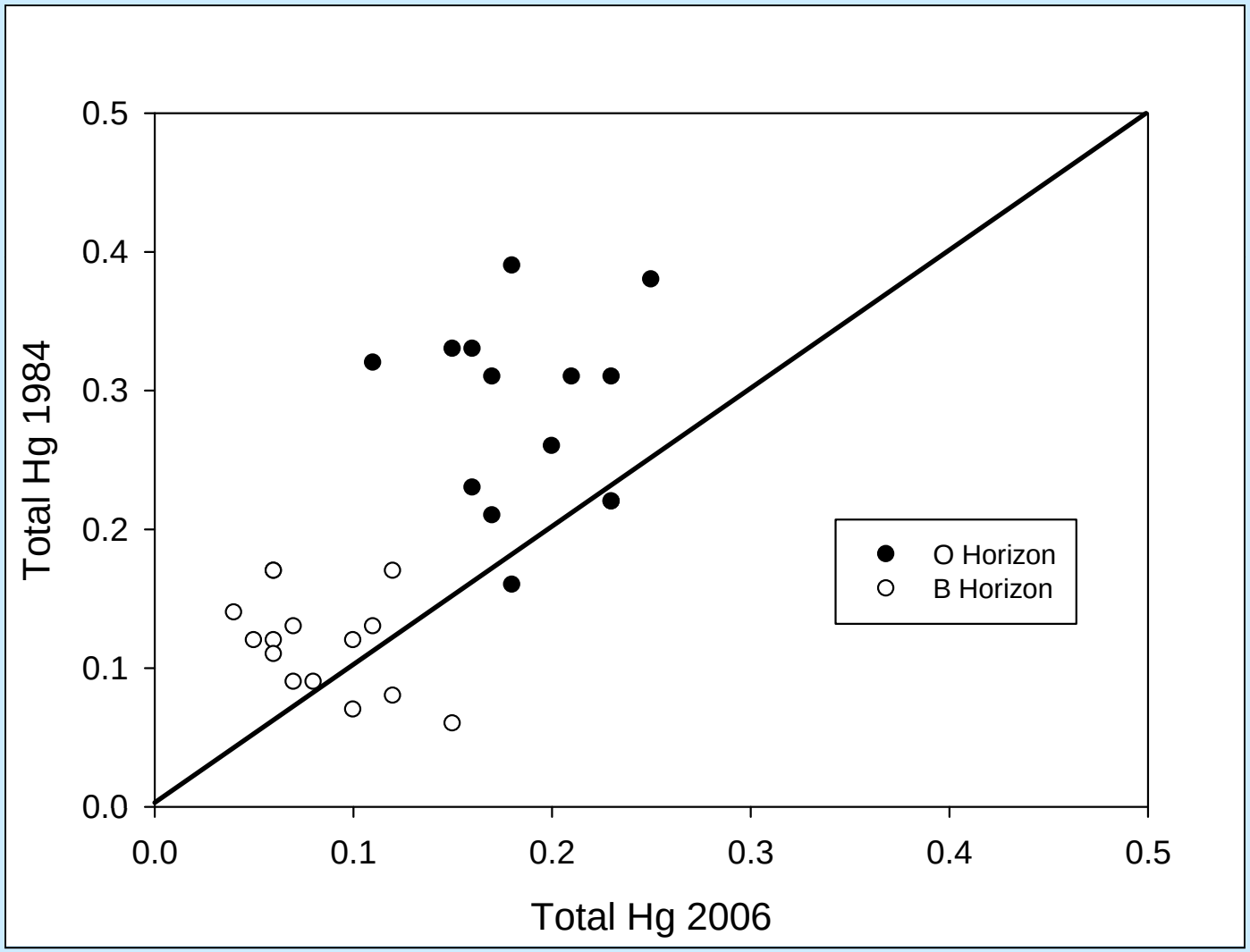
Methyl Hg


Methyl Hg (ng g-1)
7
6
5
4
3
2
1
0
Oa Wetland
B Wetland
Oa Conifer
B Conifer
Oa Hardwood
B Hardwood
Landscape Type and Horizon

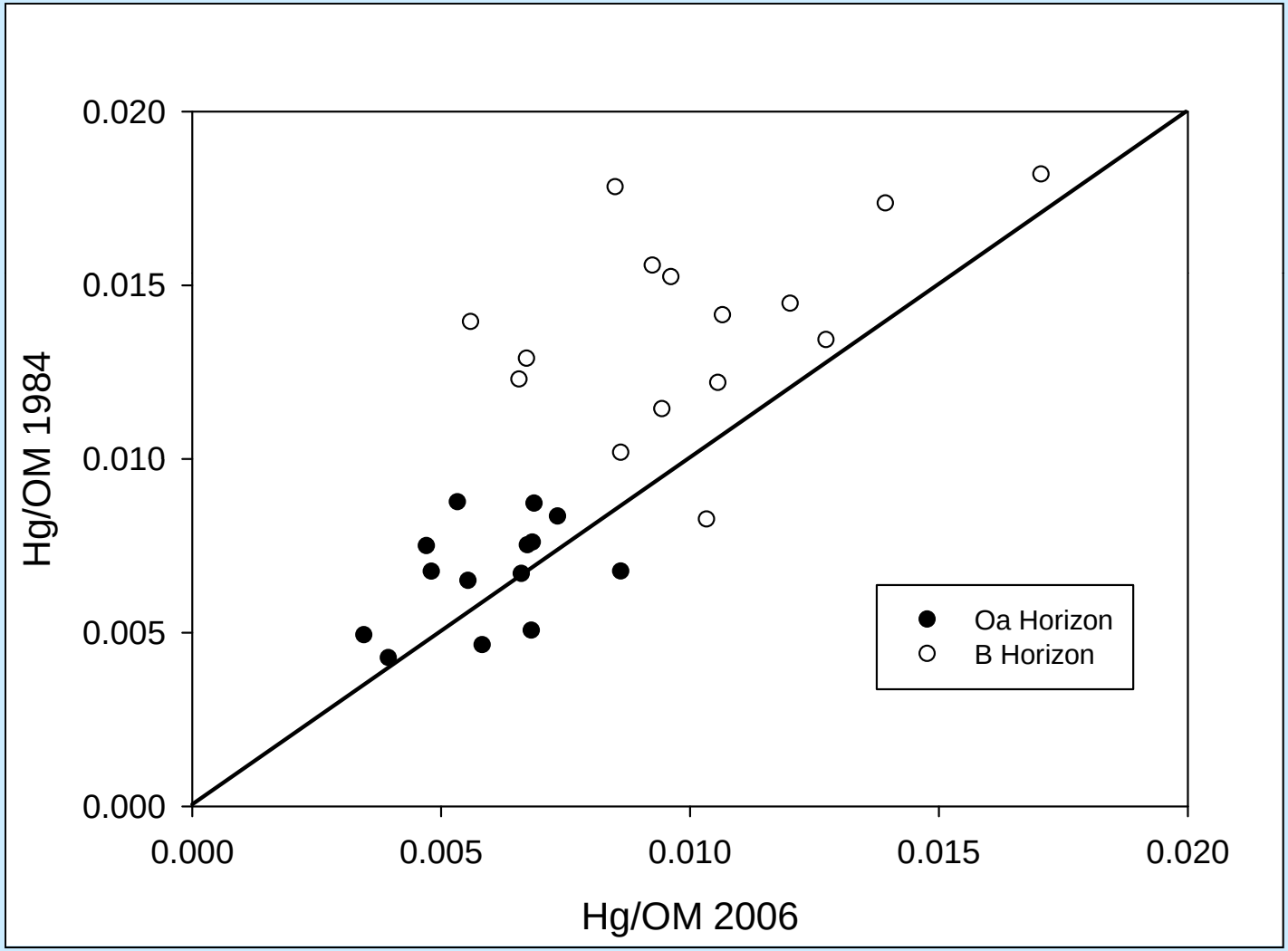
Organic Matter vs. Total Hg



Heimburger Newcomb Plots



Data Normalized for Organic Matter



Summary

- Total Hg concentrations in soils in the range of other studies – large pool
- Methyl Hg concentrations higher in wetland soils, but some high values found Oa horizons in riparian conifers and hardwood hillslopes
- Total Hg concentrations are lower in 2006 than 1984 samples from Heimburger Newcomb plots – volatile losses during storage?

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