TREE SPECIES GROWING AT THEIR ELEVATIONAL LIMITS: BIO-INDICATORS OF CLIMATIC OR ATMOSPHERIC CHANGE

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Abstract:

This new study is based on the premise that individuals growing at their elevational limits respond more noticeably to slight changes in the growing environment than individuals of the same species that are growing in the midst of their distributional ranges.

Elevational limits of sugar maple, yellow birch, paper birch, mountain birch and white ash on several Vermont mountains are being compared to evaluate the extent to which species limits are driven by elevation-related climate rather than by other variables. Density, relative density, basal area, and relative basal of the study species are being calculated, both in the overstory and understory along elevational gradients. Changes in radial growth as elevational limits are approached also are being determined. Using five-year growth increments from tree cores collected at different elevations, we are trying to determine if trees growing at different elevations track annual weather patterns equally.

We still are collecting data, but preliminary observations suggest that regeneration of all species except mountain birch is very low near the elevational limits. We hope to explore this further by installing seed traps to assess and compare annual production of viable seeds along elevational-climatic gradients.