Working Title: Exploring the relationship between remotely sensed metrics of forest canopy condition and radial tree growth on the ground.

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Abstract:

A 26 year canopy condition trend model based on Landsat 5 Thematic Mapper (TM) satellite data showed minimal changes in overall forest condition in the Northeastern United States 1984-2009. The accuracy and potential drivers of trends observed in this model have not been investigated in the field. To better understand the strengths and limitations of using Landsat to study forest health at broad scales, this study sought to answer the following questions : 1) What are the site and stand characteristics associated with localized declining and improving areas as identified by the Landsat trend model? and 2) How well does the Landsat forest canopy condition trend metric correlate with trends in radial tree growth over the same time period? Topographic, vegetation, and soil data collected across thirty field sites in Vermont and New Hampshire will be analyzed to identify characteristics associated with canopy decline and improvement. Tree-cores from a subset of eighteen of these sites, along with other pre-existing tree-ring chronologies, will be used to evaluate the model's agreement with trends in tree growth.

The final results of this study should provide critical information for interpretation of remote sensing products and inform research on the feasibility and limitations of using remotely sensed imagery to monitor forests in the Northeast at the landscape scale. Given the low-cost, high temporal resolution, and historical record of available Landsat imagery, it is a potentially very valuable monitoring tool. Understanding the field characteristics of resilient stands will also inform management activities to maintain a productive forest into the future.