

# Carbon Consequences of Changes in Wood Supply and Product Demand from Pine Plantations: Preliminary Results from Market and Life Cycle Analysis

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There are several important factors that will determine ultimate carbon outcomes associated with future pine plantation management. Increased growth and resilience of the pine resource is the focus of PINEMAP biological research and the forcing agent for many downstream effects. The focus here is on how regional market interactions and accounting for product life-cycles affects the carbon story associated with pine plantations. We offer two examples. In the first, Abt explores the price, landuse, and forest carbon consequences of increases in supply from plantations and the sensitivity to future demand. Given the disproportionate market impacts from plantations relative to their role in the landscape, price effects from plantation supply changes can influence timberland trends and dampen net carbon gains. This type of market “leakage” is a key factor in carbon accounting and we provide preliminary estimates of the welfare and market adjusted carbon consequences (Figure 1). In the second example the focus is on one source of potential future demand, the use of pulpwood for manufacturing wood pellets. Dwivedi et al. adopted an integrated life-cycle approach to analyze overall carbon savings related to the utilization of pulpwood and logging residues for electricity generation relative to their current usage. Dwivedi et al. found that the use of pulpwood for bioenergy development reduces carbon sequestered in wood products and wood present in landfills relative to a baseline where pulpwood is used for paper making and logging residues are used for manufacturing wood pellets. However, this reduction was fully compensated by the additional carbon credits generated due to displacement of fossil fuels electricity (Figure 2). Future efforts will integrate life cycle analysis into regional scale simulations.

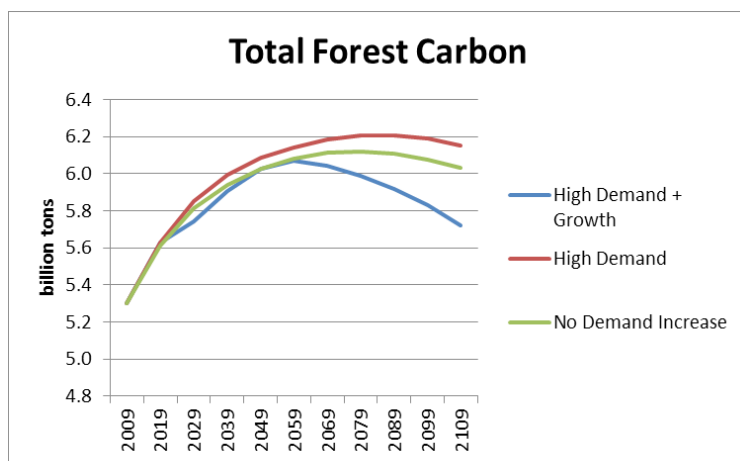


Figure 1. Total carbon sequestered in forestlands under selected scenarios.

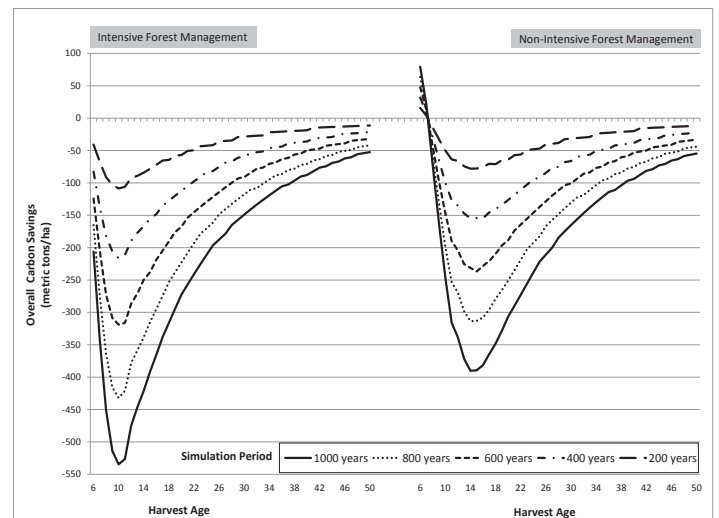


Figure 2. Results of simulations of two scenarios for two management intensities and a range of simulation lengths. For baseline case ENE-LR, harvested trees are used to produce lumber, OSB, and paper, and logging residues are used for manufacturing wood pellets for energy production. In case ENE-LR&PW, both pulpwood and logging residues are used for wood pellets. The graph shows the difference in total carbon savings saved or sequestered between the two scenarios (ENE-LR minus ENE-LR&PW), with more negative values indicating greater carbon sequestered in the ENE-LR&PW scenario.

This handout accompanies a presentation given at the 2013 PINEMAP Annual Meeting. For more information, visit the project web site: <http://www.pinemap.org>.