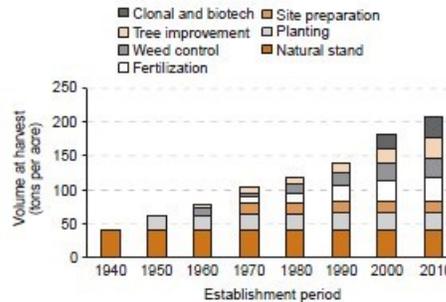


Weyerhaeuser Company Timberlands Technology Bioenergy Sustainability Research

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Forestry: Plantation forestry in the southeastern U.S. is a study in landscape design. Optimizing productivity, intensity, location, and site layout has led to a system that now produces over 4 times more volume per acre at harvest than in 1940 (Fig. 1), while maintaining much of the ecological value present in unmanaged forests.

Figure B.3—Estimated contributions of intensive management practices to productivity in pine plantations in the Southern United States from 1940 through 2010.



Fox et al., 2004

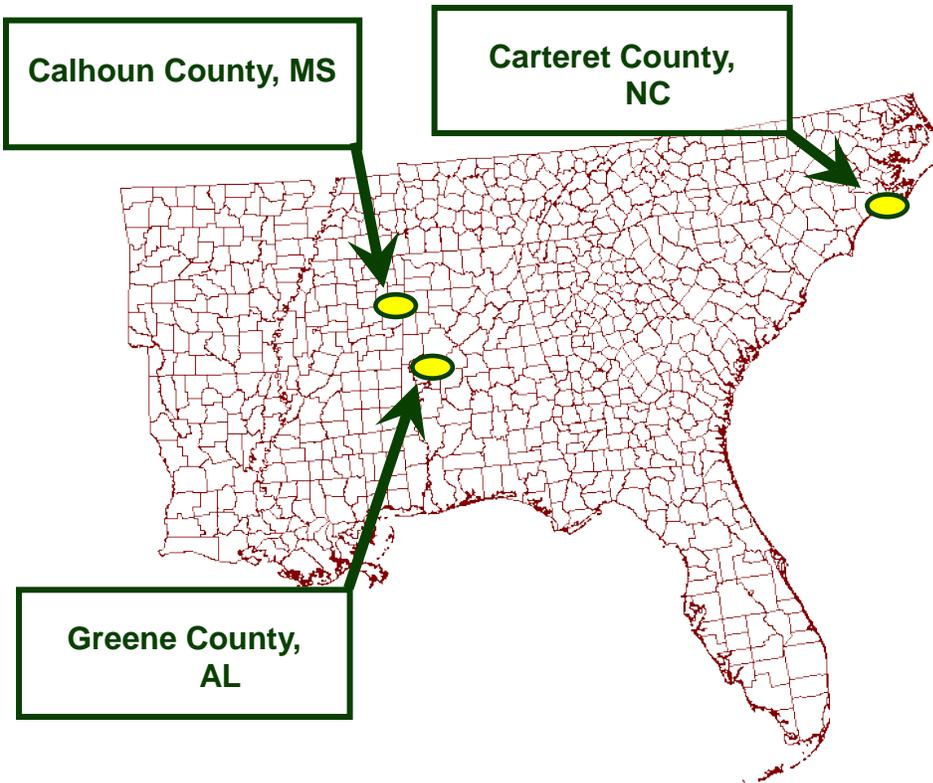
The increasing intensity of operations and return in productivity shown above means much less land is required to produce a given harvest volume, both at a landscape level and within operational tracts. Our environmental management approach identifies and focuses conservation measures on those portions of the landscape with highest ecological value and sensitivity to management. At a regional scale, our management produces a distribution of habitat types across the landscape.



Bioenergy: Weyerhaeuser entered into a joint venture with Chevron to look at the possibility of forest-based biomass for liquid transportation fuel. The joint venture, Catchlight Energy, was in place from 2008 – 2015, and initiated sustainability research into biodiversity, carbon life cycle analysis, hydrology, and soil productivity. Simultaneously, work was going into operational practices that would scale to provide needed biomass and conversion technology.

The sustainability research was designed to understand options compatible with a high value timber regime: harvest residual removal, natural understory harvest, planted understory harvest – non-timber crop trees, and interplanted dedicated energy crops. The bulk of the work presented here

and sponsored by the DOE was on interplanting switchgrass in a pine plantation, shown above and below.



The watershed sites are shown in here, but there were also 0.8 ha field plots installed in Lenoir County, NC.

Each watershed study site includes at least four small, operational-scale sub-watersheds that are instrumented to provide data on precipitation stream discharge, weather, groundwater table and water quality.

The treatments are:

- Mid-rotation pine plantation
- Pine silviculture, high value timber regime
- Pine silviculture, high value timber regime, interplanted with switchgrass
- Pine and switchgrass interplanted at the same time (Age Zero)
- Switchgrass

Status:

The switchgrass plots were harvested and baled this fall and winter for the final time. Comprehensive publications continue to come out, and a symposium will be held in Raleigh, September 28 – 29. General results find:

- Peak switchgrass evapotranspiration (ET) is higher, but overall site ET is reduced
- ET and short term soil moisture measurements and models show reduced site water use
- Intensive treatments show increased suspended sediment during the treatment period
- Stream nutrient levels have shown small changes with all treatments
- Sites suitable for bioenergy crops will be less than modeled. High erosion rates, although not always delivered to streams, were observed when using agricultural-type site prep.
- Forestry BMPs are protective, but site-specific prescriptions may be needed for more intense practices