



## Southern Timberland Index

### What is the Southern Timberland Index?

*Timber Mart-South's* Southern Timber Index (STI) allows timberland owners in the South to estimate how their timberland is performing compared to an average southern timberland property. The STI is currently a *value* index, with work underway to add an income component. Figure 1 shows how the value of the average southern timber property has changed since 1980.

### Components

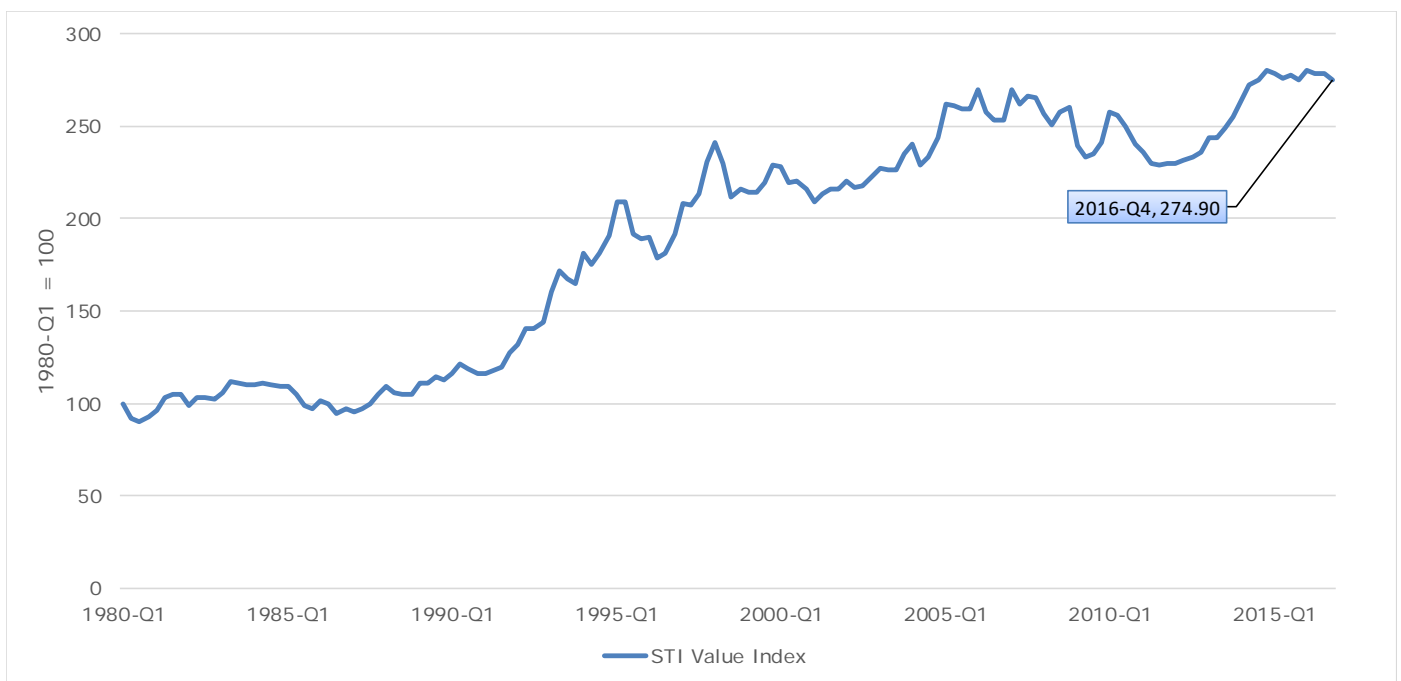
The value piece of the STI is based on the cost approach methodology frequently used by timberland appraisers. We calculate a value for the bare land, the merchantable timber and the premerchantable timber.

The STI uses annual farmland values from the US Department of Agriculture's *National Agricultural Statistical Service* (NASS) and quarterly stumpage prices from *Timber Mart-South*.

### Farmland Values

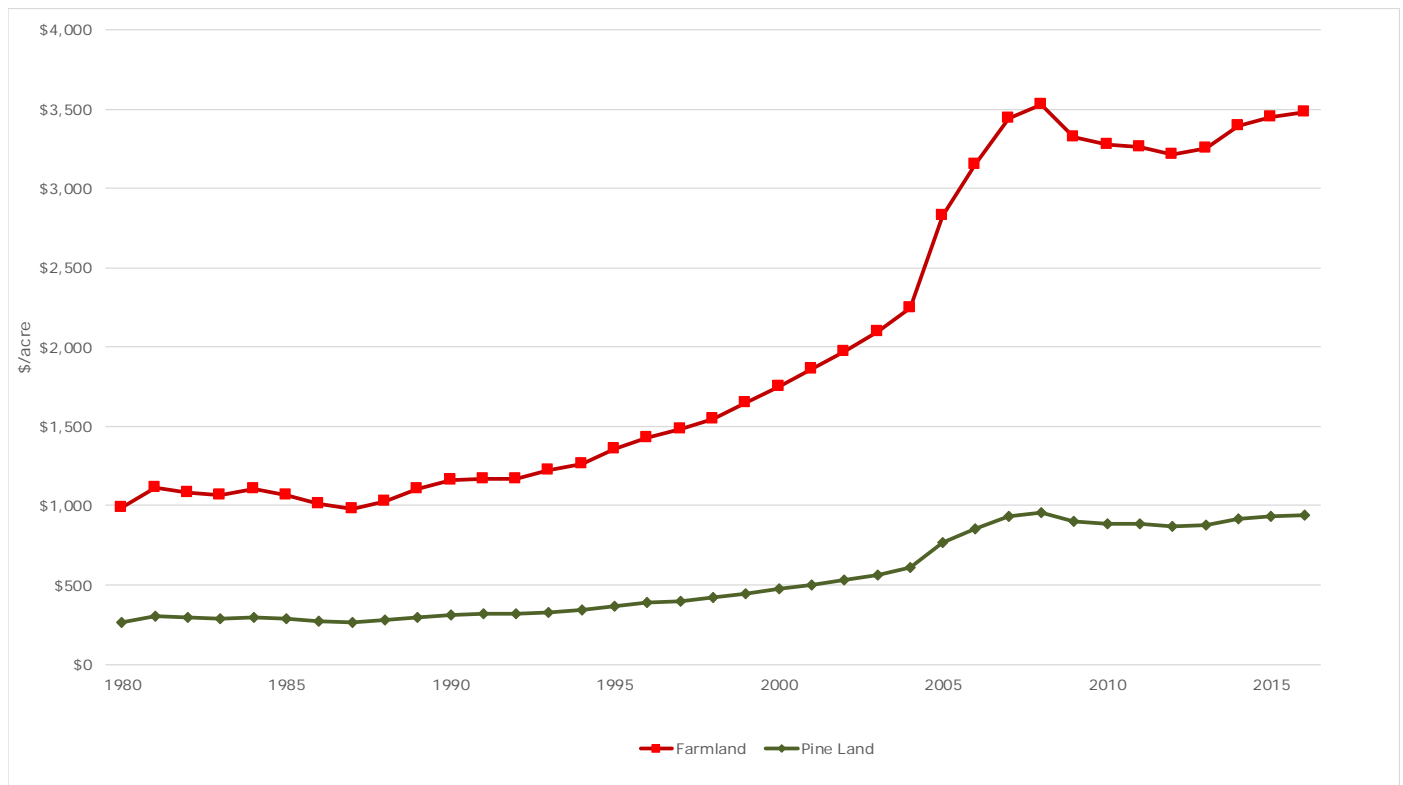
Figure 2 shows south-wide farmland values published annually by the NASS and values for bare timberland derived from them. The farmland values include the value of all buildings on farms—so *they* do not represent bare land values. But research (Washburn and Binkley, 1990) has shown that the value of bare timberland suitable for growing pine is 27 percent of these farmland values.

**Figure 1. Southern Timberland Index (Value)**



Source: *Timber Mart-South*

**Figure 2. South-wide Farmland and Bare Timberland Values**



Source: NASS

The underlying research was done almost 20 years ago and things change in the real world, but recent analysis shows that the relationship between farmland and bare timberland values still holds.

Figure 3 compares the south-wide timberland values from Figure 2 with Alabama timberland values. The Alabama timberland values were calculated by applying the 27 percent factor to Alabama farmland values reported by the NASS. Also shown in Figure 3 are current use values for timberland published by the Alabama Department of Revenue. Our calculated timberland values for Alabama fall between the “good” and “average” current use values. This leads us to conclude that the Washburn and Binkley 27 percent factor still applies today.

**Merchantable Timber Prices**

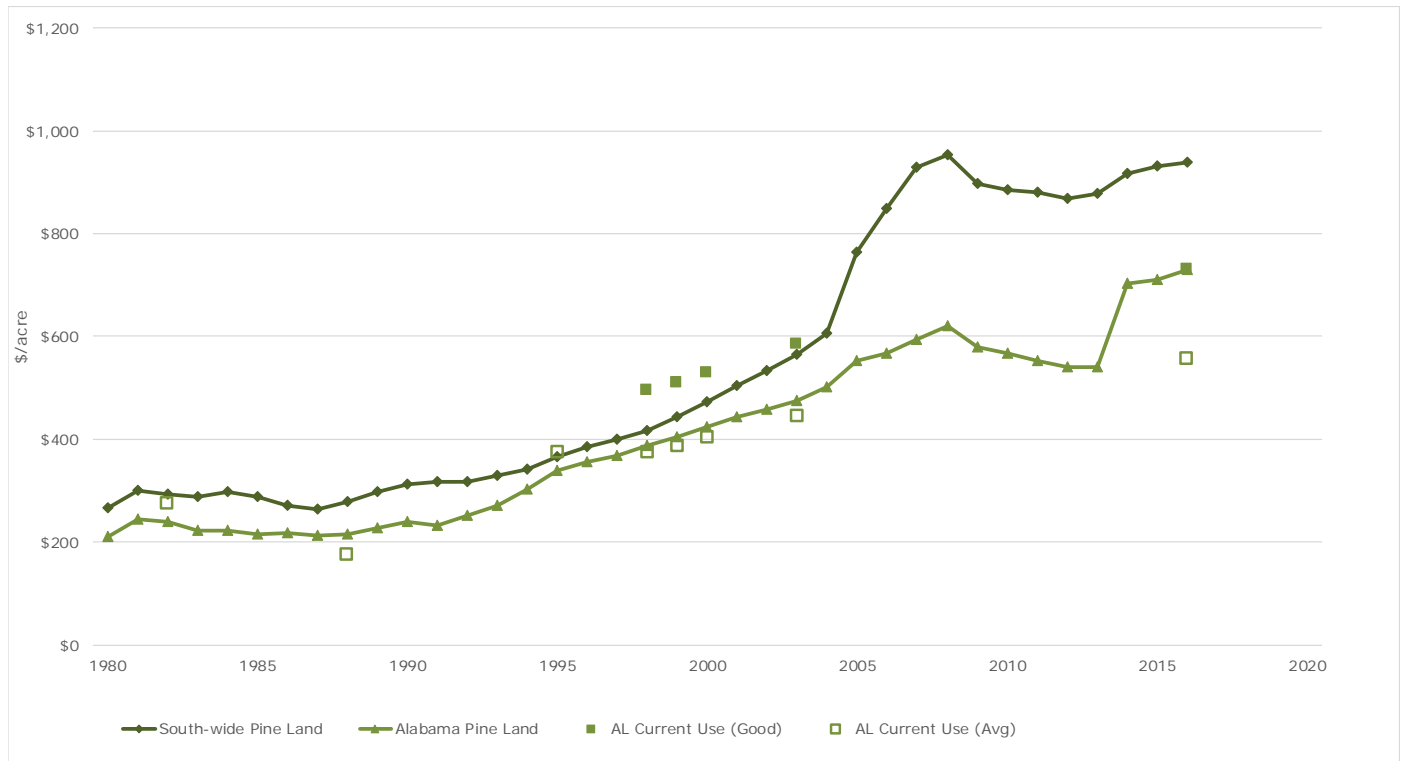
Figure 4 shows quarterly stumpage prices since 1980 from *Timber Mart-South*. These values are applied to the standing merchantable timber on the

STI property. Note how prices for hardwood sawtimber and pulpwood have been steadily increasing since about 1985. Hardwood sawtimber prices are now significantly higher than pine sawtimber and hardwood pulpwood prices have generally matched pine pulpwood prices since 2005.

**Premerchantable Timber Values**

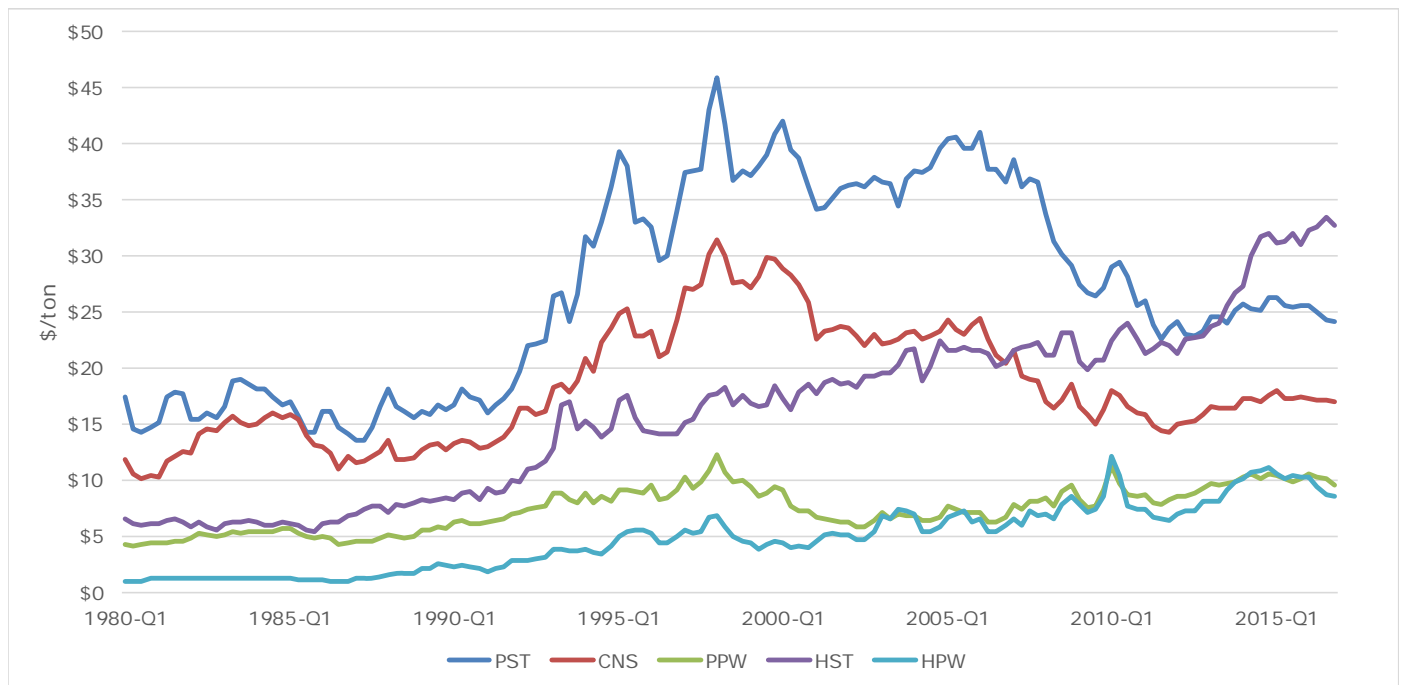
All trees 15 years old and younger are considered premerchantable. Values for this timber are calculated using a methodology often used in timberland appraisals. Just-planted stands are valued based on the cost of establishing those stands (site prep and planting). Using this as the present value and the value of the timber on a 16-year-old stand as the future value, an internal rate of return is calculated and used to calculate a value for each age class between just-planted and 16 years old.

**Figure 3. South-wide and Alabama Bare Timberland Values**



Source: Forest Research Group, Alabama Department of Revenue

**Figure 4. South-wide Average Stumpage Prices**



Source: Timber Mart-South

### **Property Attributes**

The index property is almost half pine plantation and almost half hardwood forest, with a small area of non-forested land for roads. The pine forest is fully regulated, with a constant area (and volume) harvested each year.<sup>1</sup> Half of the pine acres are in premerchantable age classes. The hardwood inventory is constant from year-to-year because the amount of hardwood harvested is equal to the hardwood growth each year.<sup>2</sup>

### **STI vs. NCREIF: Why Another Index?**

There are some structural differences between the STI and the NCREIF Timberland Index that will result in the two indexes showing different values and returns over time. Each index has its strengths and weaknesses.

### **Average Timberland vs. Institutional Timberland**

The average southern timberland, as used in the STI, is half pine and half hardwood. The typical institutional timberland investment in the South is 70-80 percent pine. Institutional properties are larger than the average property.

### **Timber and Land Values vs. Appraisals and Transactions**

The STI uses published data and applies it to the STI property using a cost approach-like methodology. The NCREIF index is calculated from appraisals and transactions (when available).

### **Changes in Index Components**

The property components of the STI are fixed—any change in value is due entirely to changes in value of those components (timber or land). The NCREIF index is subject to the *Index Number Problem*, which occurs when both the value and the units of an index change. **Very** briefly, did the value of the index change because property values increased, or did it change because a high-value property was added to the index due to its acquisition?

<sup>1</sup> Fully-regulated forests are frequently used in forest economics analysis, but are very rare in the real world.

<sup>2</sup> Also a useful assumption for forest economics analysis, and this level of precision is, also, just as rare in the real world.

### **Next Steps**

The next step in the development of the STI is to add an income component to the index. One challenge is that cost data are not as readily available as value data. While *Timber Mart-South* stumpage prices—which will be used to calculate harvest revenues—are published quarterly, cost data—site prep and planting costs, annual management costs, etc.—are not published quite so regularly.

We will also see if using statewide values for land and timber will provide valid results for a more locally-focused analysis. For example: can we apply the 27 percent factor to state farmland values to estimate a bare land value for Texas or Florida? Or will particular characteristics of farmland in those states distort our bare timberland value estimate? (Will we need to beg our appraiser friends for their bare land data for each state to calculate individual factors for each state?)

### **STI Team**

The team behind the STI includes editors at *Timber Mart-South* and faculty and graduate students at the Warnell School of Forestry at the University of Georgia. Since the publication of the inaugural note on the index in *Timber Mart-South's In Depth & In Focus* in Q3 2016, co-authors have included Harrison Hood, Tom Harris, Jacek Siry, Ben Sui, Sara Baldwin, and Jon Caulfield.

### **References**

Washburn, Courtland L. and Clark S. Binkley, 1990, Historical Returns for Forestry Investments, 1955-1989, report to RISI, pp. 85-100

Forest Research Notes, Vol. 13, No. 4  
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