Activity 4: The Changing Forests
Introduction to Southeastern Forests: Teacher Notes

Slide	Notes
1	In this presentation, we will provide facts and figures about forests in the Southeast. Topics covered include forest types, ownership patterns, benefits and products, and forest management. The major pines found in southeastern forests will also be highlighted.
2	The southeastern forests have been called a "vast local, national, and global treasure," as these forests give significant benefits to the local community and beyond. The forests are valued for their beauty, diversity, and economic importance. When we talk about this region, we use a geographical division defined by the U.S. Forest Service. The Forest Service southern region includes 13 states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.
3	Within the Southeast, the amount of forest cover varies from state to state. Alabama is the most heavily forested, and Oklahoma has the least amount of forests. Other types of land cover include developed/urban areas, grasslands, croplands/pasture, and wetlands. Texas and Oklahoma, for example, contain large amounts of grasslands and croplands. The data used to create this bar graph was published in 2011–2013.
4	The combination of the southeastern forests' terrain heterogeneity and high productivity creates a high level of biodiversity that adds to the value of these areas. The following quote from a report on forest bioenergy in the Southeast discusses these characteristics: Spanning across the low-lying and sandy soils of the Coastal Plain, the gentle slopes and clay soils of the Piedmont, and the steep sloping terrains of the southern Appalachian Mountains, the forests of the southeastern (SE) U.S. are widely recognized for their high biodiversity. Differentiated across the region by various terrains, precipitation patterns, annual temperature ranges, and dominant tree species, SE forests broadly share a wet and humid climate with mild winters that produce minimal to no persistent snow cover in even the coldest locations. These favorable climate conditions support high primary forest productivity as compared to most other U.S. forest regions and similar temperate latitudes across the world. This high productivity and terrain heterogeneity together support the wide diversity of ecological associations and wildlife habitats found throughout the SE region (Evans et al., 2013, p. 13).

5	This map shows the major forest types found in the Southeast. These seven major forest types account for 83 percent of the southeastern forest area. Notice that while oaks and pines dominate the area, there is not a single forest type that accounts for more than a third of the area. This diversity in forest communities and dominant tree species is a hallmark of forests in the Southeast. For descriptions of the forest types, see the student page in Activity 3: Atlas of Change.
6	There are eleven major pine trees found in southeastern forests. Ten of these are yellow pines, known for their sturdy wood, and one is a white pine with softer wood. The common names are listed first, followed by the scientific name in parentheses and italics. The scientific name consists of the genus name (*Pinus*) and the species name for that particular pine.
7-10	These four slides give more information about the four pines that are the primary sources of timber products in the Southeast.
11	Private noncorporate entities such as individuals, families, and nongovernmental organizations own the majority of southeastern forests. Private industries own slightly more than a quarter of the forests and this type of landowner includes timber companies, investors, and developers. Public forests account for the smallest portion and are owned by the federal government, state government, or local government (county or municipal). Public forests include national forests, national parks, U.S. Department of Defense lands, state forests, and county parks. The data used to create the pie graph was published in 2011–2013.
12	In the Southeast, most forests are privately owned; in the West, forests are more likely to be publically owned (usually by the federal government). It is important to note differing patterns of ownership because different types of owners often have different management goals.
13	Southeastern forests "provide a variety of benefits or 'ecosystem services.' For instance, southern forests yield 18 percent of the world's pulpwood for paper while comprising just two percent of the world's forest area. They protect water quality, prevent erosion, and help regulate climate by storing carbon dioxide—the leading greenhouse gas. In addition, they provide opportunities for millions of people to hike, hunt, and experience natural beauty." (Hanson et al., 2010, p. vi)
14	Since 1986, southeastern forests have produced more timber than any other country in the world (Wear & Greis, 2012). While this region certainly provides products that people typically associate with trees, such as paper, lumber, and plywood, southeastern forests also supply a range of other goods, as shown in the graphic.

15	As seen in the last two slides, pine forests can be managed to provide multiple benefits, including timber products, nontimber forest products (such as mushrooms or pine needles), wildlife habitat, water quality protection, soil stabilization, recreation, aesthetics, and land stewardship. Many pine forests in the Southeast are managed to produce economic profit from pines. Landowners decide what goals they want for their land. They often work with foresters and other natural resource managers to develop plans to achieve those goals. Management plans may be simple descriptions of the land and goals, or they may be more complex and detailed documents. Part of the process can be to review the history of the property and conduct an assessment of the natural resources currently on the property. An assessment provides information on types of trees, other vegetation, soils, water features, and wildlife. Landowners should also identify potential threats to the forest. The next slide discusses some common forest disturbances. In many areas of the Southeast, it is increasingly important for forest managers to also consider climate change, as variations in climate will likely affect pine forest productivity and forest health. Given the goals, resources, and forest conditions at the time, management plans often include recommendations about practices and actions that are most appropriate for a particular forest. Forest managers think about the forest as a system and are aware that the different aspects of the forest are all interconnected. Management practices include replanting, selecting different species, harvesting and thinning trees, applying fertilizer, enhancing wildlife habitat or species diversity, protecting water quality, and managing vegetation to reduce wildfire risk.
16	Forest disturbances can be natural or caused by humans. Climate models suggest that climate change will impact these disturbances. Some areas will see heavier rains, others will experience increased drought. The effects of one stressor can increase the vulnerability of a forest to other stressors. For example, a tree that is damaged in a storm or stressed from a drought is more susceptible to insects and diseases.
17	Thinning is the removal of trees to create space to improve overall forest health. Creating more growing space between trees promotes the growth of the remaining trees and reduces competition among them. Risks associated with wildfires, insects, and diseases are also reduced when trees are less densely populated. If timber production is a management goal, thinning can be a source of timber revenue. Thinning may be done manually with chainsaws or mechanically with machines.
18	Prescribed fire is another management practice used in southeastern forests. Prescribed fire is defined as any planned fire ignited by trained professionals under appropriate weather and safety conditions. The primary purposes of prescribed fire are to reduce the risk of wildfires by reducing understory fuel loads and to maintain or restore ecosystems that depend on fire. Landowners may also use prescribed fire to

	enhance habitat for wildlife or to prepare a site for replanting trees. In grasslands, prescribed fire is used to improve forage quality for cattle. The U.S. Forest Service reports that more than 6.4 million of acres were burned using prescribed fires for forestry purposes in 2011.
19	Increasing genetic diversity is another forest management tool that can be used to improve forest health and productivity. If all the trees in the forest were the same and a disease outbreak, insect infestation, or other disturbance occurred that targeted that type of tree, the entire forest could be damaged or even destroyed. To avoid this, landowners can plant different species and different families from within the same species in the same area. When choosing trees, forest managers select trees with traits and characteristics that best fit with projected forest conditions. They also choose trees that can tolerate a wide range of conditions. Given that climate change impacts cannot be precisely predicted, careful selection of trees for planting is important. Many of the managed pine forests in the Southeast have been regenerated using superior genetic planting stock, a method derived from tree improvement research programs that began in the 1950s. These programs have selected superior parent trees and bred them to produce offspring with better stem form, increased growth rates, and improved resistance to diseases and insects.
20	In the Southeast, fertilization is a practice normally only in pine plantations that are intensively managed. Fertilization increases the growth rate of trees, which increases economic profits for landowners. One source (Fox et al., 2006) estimates that 1.2 million acres of southeastern pine plantations were fertilized using nitrogen and/or phosphorous fertilizers in 2004.
21	Traditional sciences like biology and chemistry help inform management practices. In recent years, land managers have also begun to incorporate social science research into their work. Researchers can look at a wide range of topics and influences including forest health, silviculture (the practice of determining how to best grow trees), forest genetics, forest inventories, urban forestry, forest wildlife, and the interactions between people and forests. Forest researchers look at more than just the trees; they study plants, animals, soil, diseases, water, air, and more. In the future, research on how climate change impacts forests and how forests impact climate change likely will become a priority in forestry research. For more information on current forest research in the Southeast, visit these sites: • USDA Forest Service Southern Research Station http://www.srs.fs.usda.gov/index.html • PINEMAP http://www.pinemap.org

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