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## Forest Adaptation: Real-World Examples of Management for a Changing Climate

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The vast majority of strategies recommended for climate change adaptation in the ever-growing literature on the subject are very general and fall short when faced with the real-world challenges of forest management. As an increasing amount of relevant scientific information on forest vulnerability to climatic change becomes available, managers are searching for ways to realistically use these broad concepts to meet the more specific needs of silvicultural prescriptions and activities. We have developed Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers to provide a structured approach for translating broad adaptation strategies into specific management actions and silvicultural practices for forest adaptation. These resources are currently being used in collaboration with a variety of public, private, and tribal natural resource managers to develop projects that implement a diversity of adaptation actions while also meeting manager-identified goals. We will use examples where adaptation actions are currently being implemented in forests to describe this process, as well as also describe how these resources are being integrated into professional training for silviculturists and natural resource managers.

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## Nontimber Output Assessments: Tracking Those Other Forest Products <sup>□</sup>

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The Forest Service has been assessing timber product output (TPO) for more than 50 years by canvassing primary processors of industrial roundwood in each state on a 3–5 year cycle. TPO studies tracks what species are cut, from where they come, and what products are produced. Nontimber forest products (NTFPs) are important commodities and a valuable segment of the forest products industry. Unfortunately, they have not been monitored to assess production volumes or trends to understand the dynamics of this segment of the forest products industry. Over the last decade, FIA of the Southern Research Station occasionally has reported the status of NTFPs through “State Reports” and at the national level through RPA assessment and the Sustainable Forests reports. In 2011, FIA and Virginia Tech partnered to develop a Nontimber Product Output (NTPO) information system similar to the TPO assessments. The concept is to develop protocols to systematically monitor nontimber forest production, with an initial focus on medicinal forest products in Central Appalachia. This is providing a starting point for developing a replicable output system that can periodically report on all medicinal NTFP production. Findings from the analysis will be integrated into a geographic information system that will spatially depict various aspects of the medicinal forest products segment. The long-term goal is to create a mechanism whereby nontimber forest product outputs across the nation can be tracked regularly and more thoroughly valued. We will present the status of medicinal forest products in the study region and report progress on development of the NTPO system.

<sup>□</sup> Video of this presentation can be viewed at <http://vimeo.com/83040651>.

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## Technical and Economic Availability of Logging Residues for Bioenergy Production

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Feasibility of logging residue utilization for bioenergy purposes depends not only on technical availability of logging residues but also on their economic availability and capacity of mills to utilize logging residues. This study utilized Geographic Information Systems (GIS) and information on spatial distribution of logging residues, existing transportation networks, and transportation costs to examine technical and economic availability logging residues in Southern United States. The study also implemented a survey of 2,138 mills located in this region to determine their capacity to process logging residues for bioenergy purposes. Study results indicated that wood residues/waste generated at the mill site constituted the largest source of wood residues/waste (70%), whereas logging residues/slash delivered from a logging site accounted for 7%. On average, a mill had a capacity to utilize 3,700 tons of wood residues per month. Majority of mills disposed of wood residues/waste by selling it (60%) or reusing/recycling (38%). If recycled or reused, wood residue/waste was most often burned to produce heat (56%), used to produce electricity (39%), or reused in production of other products (5%). The most important obstacles to utilization of logging residues included high transportation costs, limited mill capacity for processing logging residues, and lack of equipment to handle logging residues. The results will be useful in producing more precise estimates related to logging residue transportation costs and their economic availability as well provide benchmark values for future bioenergy efforts based on woody biomass.

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