International report presents status and prospects for renewable energy using wood pellets from the southeastern United States

The ongoing debate about costs and benefits of wood-pellet based bioenergy production in the southeastern United States (SE US) requires an understanding of the science and context influencing market decisions associated with its sustainability. Production of pellets has garnered much attention as US exports have grown from negligible amounts in the early 2000s to 4.6 million metric tonnes in 2015. Currently, 98% of these pellet exports are shipped to Europe to displace coal in power plants.

This paper asks, “How is the production of wood pellets in the SE US affecting forest systems and the ecosystem services they provide?” To address this question, the authors review current forest conditions and the status of the wood products industry, how pellet production affects ecosystem services and biodiversity, and what methods are in place to monitor changes and protect vulnerable systems. Scientific studies provide evidence that wood pellets in the SE US are a fraction of total forestry operations and can be produced while maintaining or improving forest ecosystem services.

Ecosystem services are protected by the requirement to utilize loggers trained to apply scientifically-based best management practices in planning and implementing harvest. Bioenergy markets supplement incomes to private rural landholders and provide an incentive for forest management practices that can simultaneously benefit water quality and wildlife and reduce risk of fire and insect outbreaks. Bioenergy can also increase the value of forest land to landowners, thereby decreasing likelihood of conversion to non-forest uses. As with all land-use activities, effects on biodiversity and ecosystem services of producing pellets for bioenergy are highly variable and context specific and can have differential effects across the landscape and over time. Negative impacts can be avoided or reduced by identifying priority areas for conservation and adopting management plans tailored to best achieve multiple goals in production forests.

Monitoring and evaluation are essential to verify that regulations and good practices are achieving goals and to enable timely responses if problems arise. Conducting rigorous research to understand how conditions change in response to management choices requires baseline data, monitoring, and appropriate reference scenarios. Long-term monitoring data on forest conditions should be publicly accessible and utilized to inform adaptive management.

"Prospects for renewable energy using wood pellets" was produced through an effort coordinated by the Department of Energy's Oak Ridge National Laboratory (ORNL) following a Bioenergy Study Tour held in April 2016. During the Study Tour, participants from the US and eight other nations visited an old growth forest as well as managed forests, a biomass conversion facility, and a pellet mill. The Tour was an

excellent way to facilitate communication about bioenergy crops in the US, for different places have unique land-use histories, regulations, and ways to implement good management practices.

"This report demonstrates how science-based analysis can help us make progress toward understanding how production of wood-based pellets can enhance ecosystem services of southeastern forest systems," said lead author Virginia Dale, Director of ORNL's Center for BioEnergy Sustainability.

Joining ORNL in preparing the report were researchers from the Argonne National Laboratory and the National Renewable Energy Laboratory; foresters and land owners from the southeastern United States; and scientists from Australia, Brazil, Canada, Denmark, Germany, Poland, Sweden, The Netherlands, the United Kingdom, and the United States.

The research report is available at the Wiley online library:
http://onlinelibrary.wiley.com/doi/10.1111/gcbb.12445/full