

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) April 2015

Publications

ORNL researchers Keith Kline and Virginia Dale contributed to the Bioenergy and Sustainability report of the Scientific Committee on Problems of the Environment (SCOPE):

- Woods J, Lynd L, Laser M, Batistella M, de Castro Victoria D, Kline k, Faaij A. 2015. Land and bioenergy. Chapter 9 in (Souza GM and Joly CA, editors) Scientific Committee on Problems of the Environment (SCOPE) Rapid Assessment Process on Bioenergy and Sustainability, Paris, France.
- Joly CA, Huntley BJ, LM Verdade LM, Dale VH, Mace G, Muok B, Ravindranath NH. 2015. Biofuel impacts on biodiversity and ecosystem services. Chapter 16 in (Souza GM and Joly CA, editors) Scientific Committee on Problems of the Environment (SCOPE) Rapid Assessment Process on Bioenergy and Sustainability, Paris, France.

ORNL Presentations:

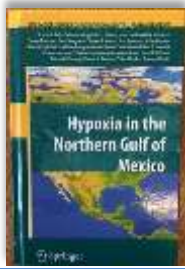
April 13: A webinar was organized by Virginia Dale and Keith Kline on the subject of Sustainability for Pellet Production in the Southeastern US. The following people participated in an exchange of information on current work and potential collaborations:

- Karen Lee Abt (Research Economist, Forest Service)
- Bob Abt (Professor, North Carolina State University)
- Scott Barrett (Asst. Professor, Virginia Tech)
- Anna Duden (PhD student at Utrecht University)
- Steef Hassen (Masters Student at Utrecht University)
- Bob Emory (Environmental Affairs Manager, Southern Timberlands)
- Caroline Gaudreault, (National Council for Air and Stream Improvement) (NCASI))
- Floor van der Hilst (Assistant Professor, Utrecht University)
- Keith L. Kline (Senior Research Staff , Environmental Sciences – ORNL)
- Virginia H. Dale (Director, Center for BioEnergy Sustainability, ORNL)
- Matthew Langholtz (Environmental Sciences, ORNL)
- Esther Parish (Environmental Sciences, ORNL)
- Reid Miner (Vice President - Sustainable Manufacturing, NCASI)
- (Ben) T. Bently Wigley, NCASI

April 17: Yetta Jager gave a presentation to the National Science Foundation Scholars, "Preparation of Data Driven Mathematical Scientists for the Workforce" at the East Tennessee State University titled "Biomass, Birds, and Better Water: Virtual tools illuminate pathways toward a sustainable bioeconomy"



April 22: Virginia Dale participated in BETO's webinar on Biofuel Sustainability. She spoke on the approach being developed at ORNL to assess progress toward sustainability, how it is being tested with switchgrass in east Tennessee, and key lessons learned.



April 30: Virginia Dale participated in a webinar of BETO's Hydrology/Water Modeling Group. She gave an overview of her book "Hypoxia in the Northern Gulf of Mexico" (2010), which derived from a review of the topic by the Science Advisory Board of the EPA, and summarized key recommendations.

CBES FORUM

The April CBES Forum included three separate events.

First on April 15th, a tour of the Carbon Fiber Technology Facility was taken. The tour was led by Facility Operations Manager, Connie Jackson. A reception was held at the home of Virginia Dale after the tour.



The second event in the CBES Forum for April was a talk by John Coulston of the USDA Forest Service Center for Forest Products Survey and Analytics in Blacksburg, VA. This talk was titled *Complex forest dynamics indicate potential for slowing carbon accumulation in the southeastern United State* and was given on April 16th at 3:30pm in the 1505, Rm. 189 conference room.

On April 27, Bob Abt of NCSU and the Southern Forest Resource Assessment Consortium gave a talk titled, *Bioenergy Demand in a Market Driven Forest Economy*, and participated in discussions about assessing sustainability of SE forest products for energy and the Billion-Ton 2016 Update forest sector inputs.



Other ORNL Activities:



March 30 – April 17: Anna Duden from the Utrecht University visited ORNL to align research interests for her PhD on sustainability aspects of the woody biomass from the southeastern US that is being used for pellets that are shipped to Europe. While at ORNL, she met with Virginia Dale, Keith Kline, Esther Parish, and Latha Baskaran (bioenergy sustainability), Forrest Hoffman and Jitu Kumar (ForWarn), Matt Langholtz (the Billion Ton Study), Nate Sutton (biodiversity) and Ben Preston (adaptation to climate change and land-use change). She also took a trip to Frozen Head State Park with Mac Post.

April 6 – 17: Steef Hanssen from Utrecht University visited ORNL to work on his Masters thesis research entitled: “The effect of biophysical and forest management variables on carbon payback times of wood pellets from the South-Eastern US used for bioenergy in Europe.” While here, Steef met with Esther Parish, Melanie Mays, Maggie Davis, Bob Cook, Keith Kline, and Virginia Dale.



Both Anna and Steef took a trip to the Smokey Mountains National Park with Mac Post and



Both Anna and Steef toured the Oak Ridge Hardwoods sawmill with Adam Taylor and Neelam Poudyal.

April 8: Virginia Dale and Esther Parish accompanied student visitors Anna Duden and Steef Hassen from Utrecht University in the Netherlands on a tour of the UT Arboretum. The tour was provided by the Arboretum Director, Kevin Hoyt.



Wood left after clear cutting at UT Arboretum

April 10: Esther Parish, Virginia Dale, Anna Duden and Steef Hanssen visited the UT campus and met with Neelam Poudyal, Adam Taylor and Timothy Young of the UT Institute of Agriculture.

April 13: Several ORNL staff participated in a workshop with a team from Tennessee Technological University exploring research collaborations related to the water-energy-climate nexus.

April 16: Virginia Dale, Keith Kline, Anna Duden and Steef Hanssen met with Don Hodges of the UT Institute of Agriculture to discuss perspectives about forest bioenergy of small land owners.

April 17: Rebecca Efroymson and Matt Langholtz organized a webinar for the Board members of the Algae Biomass Organization (ABO) to solicit feedback on assumptions that are going into resource analyses for the algae biomass chapter of the Billion Ton 2016 report. The “Algae Supply Curve Project: ABO Review and Feedback” was presented by the collaborative team for this task: Matt Langholtz, Rebecca Efroymson, Shahab Sokhansanj (ORNL); Susan Schoenung (Longitude 122 West, Inc.), and Andre Coleman and Mark Wigmosta (PNNL). As a result of the webinar, we have discussed potential changes in assumptions with ABO, and we expect to discuss more specific assumptions with individual companies.

April 20: Keith Kline and Virginia Dale participated in the BETO conference call about international activities

April 24: Rebecca Efrogmson discussed the components of the algae project “Sustainable Development of Algae for Biofuel” with Yan Poon, VP of Research and Development and a co-founder of Sapphire Energy, Inc., and Becky Ryan, Director of Field Testing.

April 28: Keith Kline, Nagendra Singh and Virginia Dale had a phone conversation with Tyler Lark and Holly Gibbs about appropriately reporting the assumptions and all data regarding changes in land use and management.

April 29: Virginia Dale, Keith Kline and Esther Parish toured Oak Ridge Hardwoods Sawmill. The tour was conducted by Adam Taylor of the University of Tennessee Institute of Agriculture.



Matt Langholtz and others at ORNL have recurring calls with Jennifer Dunn and colleagues at Argonne National Lab and Danny Inman and others at the National Renewable Energy Lab regarding greenhouse gases, soil organic carbon, and air quality assessment for Volume 2 of the 2016 Billion-Ton Report.

Upcoming ORNL Visits/Events:

May 15: Matt Carr of the Algae Biomass Organization has requested a Congressional briefing to the Tennessee delegation on this date, termed “Tennessee Algae Day.” He will discuss (broadly) ORNL’s algae research, and Jeff Kanel of Renewable Algal Energy in Johnson City, and Joel Murdock at Federal Express will also participate.

May 17-21: Natalie Griffiths will give a talk on “Effects of short-rotation pine management for bioenergy on water quality in the southeastern United States” at the Society for Freshwater Science conference in Milwaukee, May 17-21.

May 19-23: Virginia Dale and Keith Kline plan to attend the International Energy Agency (IEA) Bioenergy Task Force 43 Meeting in Dublin, Ireland.

May 30-June 5: Keith Kline and Maggie Davis will attend the annual meeting at Michigan Technological University (MTU) for the NSF Partnership in International Research and Education (PIRE) and Research Coordination Network (RCN) conference on Sustainable Bioenergy in the Americas.

June 15-17: Virginia Dale will give a talk on “Approach for sustainability assessment of southeast pellet production” at the Forestry Technical Session at the 2015 Southern Regional Meeting of the National Council for Air and Stream Improvement (NCASI) in Greenville, SC

June 23-24: Tim Theiss, Virginia Dale, and others plan to attend the “DOE Bioenergy 2015: Opportunities in a Changing Energy Landscape” conference in Washington, D.C.

June 24: A work session is being organized with the American Society for Testing and Materials (ASTM) International Committee E48.80 for a new standard relevant to sustainability concepts, definitions and assessment of energy and industrial chemicals from biomass. See the ASTM website: <http://myastm.astm.org> to register for the June meeting. Contact Maggie Davis or Keith Kline for more information.

July 5-11: Virginia Dale plans to attend the 9th International Association of Landscape Ecology (IALE) World Congress in Portland, Oregon, and will present an invited talk on “Ecological implications of energy use: a focus on scale” in the John A. Wiens Symposium on Spatial Scaling in Ecology.

August 8-14: Virginia Dale plans to attend the 2015 Ecological Society of America (ESA) Annual Meeting and give an invited talk. Keith Kline will also present on a landscape design approach for assessing trade-offs and sustainability of woody biomass production from forests in the Southeastern United States. This meeting is taking place in Baltimore, Maryland.

October 26-29: Virginia Dale plans to participate in the International Energy Agency (IEA) Bioenergy Conference 2015 in Berlin, Germany.

November 2-6: Keith Kline and Maggie Davis plan to attend the Society of American Foresters annual convention and present on, “Bioenergy Trade and Sustainability Assessment: Science, Truth and Consequences” and “Indirect Effects of Bioenergy: International Standards and Science.”