

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) October 2011

ORNL Publications:

Parish, ES, Hilliard M, LM Baskaran, VH Dale, NA Griffiths, PJ Mulholland, A Sorokine, ME Downing, R Middleton, NA Thomas. In press. Multimetric Spatial Optimization of Switchgrass Plantings Across a Watershed. *Biofuels, Bioprod. Bioref.*

ORNL Presentations:

October 9-12 - Debo Oladosu gave a presentation at the 30th U.S. Association for Energy Economics/International Association for Energy Economic (USAEE/IAEE) North American Conference from October 9-12, 2011 at the Capital Hilton Hotel, Washington, DC. The presentation examines the global indirect energy use and associated emission implications of biofuels policy in the USA.

October 10 – Rocio Uria-Martinez gave a presentation at the 30th USAEE/IAEE North American Conference from October 9-12, 2011 at the Capital Hilton Hotel, Washington, DC. The presentation is on “Modeling Energy Security and Economic Sustainability Issues of the U.S. Biofuel Industry” Co-authors are Paul Leiby and ‘Debo Oladosu of ORNL.

October 11 – Paul Leiby gave a presentation at the 30th USAEE/IAEE North American Conference from October 9-12, 2011 at the Capital Hilton Hotel, Washington, DC. The presentation is on “National Low Carbon Fuel Standard: Tradable Credits System Design and Cost Savings” Co-author is Prof. Jonathan Rubin, U. Maine. This paper considers the role of low-carbon biofuels under a hypothetical national standard for average motor fuel carbon intensity, such as that being implemented in California, with a focus on flexible credit markets.

October 18-19 – Keith Kline presented “Perspectives on Land-Use Change Analyses” to open a Session on “Land-Use Change and GHG Emissions – New Data, New Approaches & Estimation Questions” at the Coordinating Research Council (CRC) Lifecycle Analysis Workshop, at Argonne National Laboratory.

October 25 - Virginia Dale gave presentations on “Environmental Stewardship” for bioenergy crop production during the Biomass Production Field Day in Vonore, TN, sponsored by the University of Tennessee, the US Dept. of Energy, Genera Energy, Ceres Inc., and DuPont Danisco Cellulosic Ethanol - <http://www.biomassfieldday.com>. Over the two days, over 1,000 people heard about biomass production, preprocessing, and conversion. Mark Downing also attended the event and ORNL’s large poster on its bioenergy research program was displayed.

October 25-26 – Laurence Eaton attended a DOE/Office of Science sponsored US-EC Life Cycle Analysis (LCA) workshop at the University of Illinois on October 25 and gave a presentation entitled “Resource Analysis and LCA of Biomass Products: Models, Results, and Steps Toward Integration for Policy Analysis.” The workshop focused on the sustainability of Biomass production for bioenergy with discussion on the critical needs for making economic and environmental LCAs more effective and realistic, focusing on biofuels. He will follow up with workshop attendees on steps toward integrating LCA performance characteristics in feedstock production modeling. A call is tentatively scheduled for November 9 at 9:00AM EST and will be hosted by ORNL with participation from NREL.

Oct 25: Keith Kline gave a briefing and presentation titled, “Updates: ISO PC-248 Sustainability Criteria for Bioenergy and Perspectives on Land-Use Change Analyses” to staff at DOE Office of Biomass Programs DOE-OBP-Sustainability (Ranyee Chiang, Alicia Lindauer, Kristen Johnson) and EERE-International (Dan Birns, Rob Sandoli, Helena Berger).

October 26 – Matt Langholtz attended the Florida Energy Summit in Orlando, Florida on October 26 and gave a presentation entitled “Overview of the Billion-Ton Update.” The Farm-to-Fuel track of the summit focused on the potential of dedicated feedstocks for biofuels production in the Southeast.

October 27 - Dr. Rebecca Garlock Ong from Michigan State University gave a presentation on “Interactions between Biomass Feedstock Characteristics and Bioenergy Productions: From the Landscape to the Molecular Scale”

ORNL CBES Forum:

October 20 – Jacob LaRiviere, Assistant Professor of Economics at the University of Tennessee presented “The Effect of Ethanol on Fuel Price Behavior and the Viability of Cellulosic Biofuels”. This presentation can be accessed at the CBES website under forums: <http://www.ornl.gov/sci/ees/cbes/forums.shtml>

Other ORNL Activities:

Oct 3-4 – Matt Langholtz and Virginia Dale participated in the Council on Sustainable Biomass Production (CSBP) meeting in Knoxville, TN. The meeting focused on continued development of biomass certification standards and processes for producers and consumers, targeting roll-out in July of 2012.

Oct 4-7 - Debo Oladosu and Keith Kline collaborated with research colleagues in Brazil to review and comment on the revised Global Trade Analysis Project (GTAP) model simulations for indirect land-use change that were presented to the California Air Resource Board (CARB) and released to the public on 15 Sept 2011.

The National Research Council (NRC) report on “Potential Economic and Environmental Effects of U.S. Biofuel Policy” was released on October 4. As one of the authors of this report, Virginia Dale talked with several people about her concerns that the report can be misleading if the assumptions of the analysis are not considered. She points out that with any scientific process, it is difficult to reach conclusions when (a) the data are inadequate, (b) some models are applied at scales inappropriate to the situation, or (c) key processes are not included in the theories. All of these limitations, she says, are applicable to current analyses of the effects of biofuels. The answer to the question of what are the economic and environmental effects of biofuels is that 'it always depends' on a broad set of preexisting conditions, trends and available options, with no one solution being the best for all situations. Her perspective was reported in several places:

- <http://news.sciencemag.org/scienceinsider/2011/10/panel-doubts-us-biofuels-goals.html>
- <http://blog.25x25.org/>
- <http://news.medill.northwestern.edu/chicago/news.aspx?id=189869>

In addition, Virginia communicated with

- Elliott Levine, who handles press for DOE–EERE. He was looking for someone who lives in Washington, DC, to speak at a Nov 8-9 high level meeting at DOE. Virginia suggested that he contact Ari Patrinos who also served on the NRC committee.
- Jetta Wong, who covers issues related to renewable energy and energy efficiency policy for the House Committee on Science and Technology in Washington, DC. At her request, Virginia emailed Jetta some of the recent commentaries on the report and the recent paper by Kline et al. (In press in *Biomass and Bioenergy*).
- Tara Billingsley, Senior Professional Staff Member with the Committee on Energy and Natural Resources U.S. Senate, who asked Virginia to provide some comments on the process used by the National Academy.

Oct 11—Esther Parish met with University of Tennessee Civil Engineering Prof. John Schwartz, his doctoral student Zachariah Seiden, and Sam Jackson of Genera Energy LLC to discuss plans for installing hydrology/water quality sampling equipment in eight catchments near the Vonore Biorefinery. Using USDA monies recently awarded to the Southeastern Partnership for Integrated Biomass Supply Systems (IBSS), several years' worth of field data will be collected from catchments that have already been planted with different proportions of switchgrass. Prof. Schwartz and his student are currently conducting walkdowns of the most promising site locations identified through the ORNL digital analysis of current switchgrass plantings. Sampling is scheduled to begin in Spring 2012, and data collected by UT staff will be used to verify ORNL's Biomass Location for Optimal Sustainability Model (BLOSM) results for the Lower Little Tennessee Watershed.

Oct 18—Laurence Eaton and Esther Parish met with Sam Jackson and Mladen Grbovic of the University of Tennessee (UT) to discuss upcoming GIS tasks designed to assist the UT GIS Lead for the Sun Grant Initiative's Southeast Regional Center under a new subcontract.

Rebecca Efrogmson is leading the development of an issue paper on the identification and use of ecological endpoints for a biofuel feedstock ecological risk assessment. The work is being done for Versar, Inc. and, along with Environmental Protection Agency (EPA's) conceptual models for assessing ecological risk from biofuel feedstock production, will form the basis of an upcoming EPA workshop.

Oct 24: Kline Participated in the Sao Paulo Research Foundation (FAPESP) conference in Washington, D.C. and side-discussions on collaborations related to land-use change and bioenergy production in Brazil.

Oct 4, 11, 20, 24 and 28: Keith Kline participated in conference calls and meetings to develop next steps for the Global Sustainable Bioenergy (GSB) Project involving representatives from Europe, US and South American universities and research centers.

Upcoming ORNL Visits/Events:

November 10-11 – Virginia Dale will visit Michigan Technological University as a Distinguished Ecologist lecturer in the School of Forest Resources and Environmental Science.

November 13-16 – Mike Hilliard will give a presentation at the Annual Meeting of the Institute for Management Science and Operations Research (INFORMS) in Charlotte, NC, on the Biomass Location for Optimal Sustainability Model (BLOSM) --Balancing Profit and Water

Quality in a Watershed. His presentation will use data from the watershed surrounding a cellulosic ethanol refinery in Tennessee; an optimization model paired with results from a water quality model demonstrates that planting switchgrass in the right locations can improve nitrogen, phosphorus and sediment levels with a moderate impact on revenue. A web-based interface communicates the results.

<https://informs.emeeetingsonline.com/emeetings/formbuilder/clustersessiondtl.asp?csnno=15781&mmnno=206&ppnno=57555>

Nov 15-16—Virginia Dale and Esther Parish will participate in a Southeastern Partnership for Integrated Biomass Supply Systems (IBSS) Inaugural Charrette meeting in Knoxville to kickoff plans for this USDA-funded project that will involve several universities and private companies from across the region.

Nov 16 -At a meeting of the Laboratory Energy R&D Working Group in Washington, DC, Bob Perlack will speak about the Billion Ton Update, and Virginia Dale will talk about the recent National Research Council (NRC) report "Potential Economic and Environmental Effects of U.S. Biofuel Policy."

November 17-18 – Virginia Dale will give a plenary talk on infrastructure sustainability and resilience at the National Science Foundation Emerging Frontiers in Research Innovation, Resilient and Sustainable Infrastructures Program (NSF-EFRI RESIN) Workshop in Champaign, IL. <http://ict.illinois.edu/conferences/RESINworkshop2011/>

November 29-December 1 – Rebecca Efroymsen, Yetta Jager and Virginia Dale will participate in a workshop on EPA's conceptual models, which diagram activities and potential impacts of biofuel feedstock production. These conceptual models were first developed for EPA's Biofuels and the Environment: First Triennial Report to Congress.

December 5-9 – Virginia Dale will present at the American Geophysical Union (AGU) Fall meeting to be held in San Francisco, CA.

February 22-24, 2012 – Virginia Dale will speak on “Environmental and socioeconomic indicators for bioenergy sustainability as applied to Eucalyptus” at symposium on “Assessment and Management of Environmental Issues Related to Eucalyptus Culture in the Southern United States”. The symposium is being organized by the USDA Forest Service and the National Council for Air and Stream Improvement, Inc. (NCASI) in Charleston, SC. Matt Langholtz is assisting in the preparation of this paper.

April 16-20, 2012 - Keith Kline and Maggie Davis will participate in the second plenary meeting of the ISO Project Committee (PC248) developing a standard on “Sustainability Criteria for Bioenergy” hosted by the U.S. Technical Advisory Group at Argonne National Lab.

Virginia Dale will serve as a member of the Conference Programming Committee for the "Science for Biomass Feedstock Production and Utilization National Conference" to be held in October 2012 in New Orleans and sponsored by the Sun Grant Initiative.

<http://www.sungrant.org/News+and+Events/2012+National+Conference.htm>