

Bioenergy, Sustainability, and Land-Use Change Report Oak Ridge National Laboratory (ORNL) March 2013

ORNL Publications:

- Kang, S., Nair, S. S., Kline, K. L., Nichols, J. A., Wang, D., Post, W. M., Brandt, C. C., Wullschleger, S. D., Singh, N. and Wei, Y. (2013), Global simulation of bioenergy crop productivity: analytical framework and case study for switchgrass. GCB Bioenergy. doi: 10.1111/gcbb.12047. Published (effort supported with counterpart to WBS 6.5.1.3 – Brazil International).
- Gbadebo Oladosu, Maggie Davis, Keith Kline. Estimates of Eucalyptus Supply Curves in Brazil Using a Hybrid Process-Regression Method. Paper submitted to the International Journal of Forestry Research. This paper uses data on Eucalyptus production in Brazil to illustrate a hybrid model that incorporates plantation variables such as stand age, management, land availability, and site productivity indices but can be used to estimate biomass potential and costs over large areas.

ORNL Presentations:

- Virginia Dale was an invited plenary speaker at the Ecological Society of Mexico annual meeting March 18-22 in Villahermosa, Mexico. At the meeting she
 - Gave plenary lecture on “Developing and Distributing Knowledge Appropriate for Decision Making”
 - Was interviewed by two newspapers: The Herald out of Villahermosa and *La Jornada* out of Mexico City
 - Gave an invited lecture on “Sustainable Bioenergy Challenges and Perspectives” at the Colegio de Postgraduados at the Campus Tabasco in Cardenas, Tabasco, Mexico
 - Lead a Cafés Científicos discussion on “Bioenergy Opportunities in Mexico”

Other ORNL Activities:

- The Water Quality/Biodiversity task (L. Baskaran) completed a new set of seven water quality simulations using the 2012 version of SWAT. Scenarios included a baseline pre-cellulosic scenario, business-as-usual future BT scenarios for 2022 and 2030, and future BT scenarios for 2022 and 2030 with and without harvest of wheat stover.
- The Water Quality/Biodiversity task (L. Baskaran) completed simulations to estimate geographic variation in optimal fertilizer amounts for switchgrass by assuming exact replacement of harvested biomass. Maps are being submitted to the Knowledge Discovery Framework to fulfill our 2nd quarter milestone.
- Yetta Jager conducted scoping activities for this summer’s planned effort to simulate the effects of future climate on cellulosic energy yields. This involved assembling information regarding climate change projections and downscaling efforts for the western portion of the Arkansas River basin.
- March 8 - Esther Parish and Latha Baskaran completed a short course in Supercomputing designed to provide a brief introduction to the concepts of high performance computing (HPC), as well as introduce the tools and methods for using high performance computers to solve scientific problems. Laurence Eaton also attended at UT. The course was offered by the [National Institute for Computational Sciences \(NICS\)](#) and the [Joint Institute for Computational Sciences \(JICS\)](#)
- March 7-8 – Virginia Dale served as panelist on the National Science Foundation’s Exploratory and Research Collaborative Network Grants Panel in Arlington, VA.
- Laurence Eaton and Matt Langholtz participated in the USDA/DOE Biomass Feedstocks Coordination Meeting on March 14, 2013.

- ORNL Resource Analysis is coordinating team meetings with the SGI Regional Feedstock Partnership Field Trial Partners and Resource Assessment team to synthesize the results of the yield trials for national potential yield modeling of energy crops and residues. The meetings with each of the energy crop teams will occur in various locations across the country, including Oregon State University, Oak Ridge National Laboratory, Mississippi State University, Kansas State University, and other locations to be determined. The final product will be a series of average crop productivity maps at high spatial resolution generated using a uniform methodology and climatological and soils datasets. The first two meetings will occur May 7-9 in Raymond, MS (Energycane) and May 28-29 in Corvallis, OR (Switchgrass). The Sorghum meeting is tentatively scheduled for late August at ORNL.
- March 7 – ORNL staff including Kline and Bhaduri met with USAID and Gates Foundation to discuss collaborations related to sustainable development/food-security initiatives (e.g., Feed the Future).
- Keith Kline and Virginia Dale worked with Jodie Endres to support the Council on Sustainable Biomass Production (CSBP) in completing its obligations under current contracts. Most importantly, a report was submitted by Meridian on behalf of CSBP to NRCS titled “A comprehensive standard and national certification program for sustainable production of cellulosic biomass and bioenergy.”
- March 13 – Virginia Dale, Keith Kline and Debo Oladosu discussed joint analysis of opportunities to design bioenergy systems for food and energy security with colleagues from the UN Food and Agriculture Organization (FAO).
- March 14 –ORNL and NREL are coordinating a small workshop to look at models and approaches to estimate effects of land-use change
- March 14- Laurence Eaton and Matt Langholtz participated in the USDA/DOE biomass Feedstocks Coordination meeting.
- March 18-28 – Keith Kline and Maggie Davis participated in 7 webinars and conference calls and multiple side-group discussions as efforts continued on the next iteration of draft standard (CD2), “Criteria for sustainable bioenergy.” ORNL continues to contribute to four Working Groups to respond to review comments and produce CD2 by June (Q3 milestone).
- Kline contributed to revisions of the IEA strategic inter-task study “Monitoring Sustainability Certification of Bioenergy” (IEA Bioenergy Tasks 38, 40 and 43) in coordination with NREL (H. Chum).
- March 11-13 - Kline and Davis assisted EERE to develop talking points for US-Brazil Strategic Energy Dialogue.
- March 5, 11 and 18 –Global Sustainable Bioenergy project team meetings held to continue development of common approaches for land inventory data, modeling and food-fuel analyses.

Upcoming ORNL Visits/Events:

April 2-4 – Virginia Dale will be a guest plenary speaker at the 2013 Conference on Invasion Biology, Ecology and Management Conference in Lexington, KY.

April 14-18 – Esther Parish and Virginia Dale will present at the annual symposium of the US chapter of the International Association of Landscape Ecologists in Austin, TX.

April 9-13 – Latha Baskaran will present at the Association of American Geographers (AAG) annual meeting in Los Angeles, CA.

May 7-8 – NREL/ORNL Bio-LUC model and LUC modeling review workshop at ORNL.

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May 13 – Virginia will be a keynote speaker at the University of Georgia's Bioenergy Systems Research Institute (BSRI) retreat, at which the focus is "Sustainability and Bioenergy Systems."

May 20-24 – BETO Peer Review

May 27-31 – NSF PIRE and Collaborative Research Network biofuels workshops (back-to-back) hosted by Argentina (funded by NSF grant/MTU).

June 1-15 – Brazil biofuel sustainability research collaborations for land inventory, LUC, and socio-economic indicators (funded by counterparts in Brazil).

August 13-15 – Martin Schweitzer will be attending the International Energy Program Evaluation Conference in Chicago, IL.

Matt Langholtz and Laurence Eaton will lead a webinar on August 21 with NCSU Forestry Extension on the topic of Projections of Agricultural Land Use for Bioenergy Production. The webinar will be hosted at <http://www.forestrywebinars.net/>. The audience will be natural resource professionals, private landowners, and the general public.

October (dates to be determined) – ISO PC 248 Plenary to review second committee draft of ISO 13065, Sustainability Criteria for Bioenergy.