

BESD Newsletter
October 2010

Pubs and Products

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Igathinathane, C., Womac, A. R., and S. Sokhansanj. 2010. Corn stalk orientation effect on mechanical cutting. *Biosyst. Eng.* 107: 97-106.

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Mathematical modeling of hydrolysate diffusion and utilization in cellulolytic biofilms of the extreme thermophile *Caldicellulosiruptor obsidiansis*. *Bioresource Technol.* Available online. DOI: 10.1016/j.biortech.2010.10.104

Notable Achievements

A presentation entitled “Forest resources for bioenergy in the Southeast USA: examples of modeling to optimize bioenergy plants and to assess sustainability” was given by Yun Wu, at the 4th China-U.S. Annual Symposium “Energy, Ecosystem, and Environmental Change” (E3C) on September 23rd, in Beijing, China.

On September 28th, Shahab Sokhansanj participated made a webinar presentation on Integrated Biomass Analysis and Logistics (IBSAL). The webinar was organized by the Environmental Protection Agency (EPA). The other participants were Neil Rossmeissl of the Department of Energy (DOE) Office of the Biomass Program (OBP) and Kristi Moriarty. Neil presented the Biomass Scenario Model. Kristi presented the National Renewable Energy Laboratory’s (NREL) Map Atlas tools.

October 1st, Keith Kline was interviewed by Maggie Koerth-Baker, a science journalist working on a book about the future of energy in the United States for Wiley & Sons publishers.

Steve Brown presented his talk “*Clostridium thermocellum* Ethanol Stress Responses and Tolerance Mechanisms” at the Clostridium 11 Meeting, October 3rd-6th, San Diego, California. This was the 11th conference on the fuel-producing *Clostridium*, held every two years since 1990.

Rich Norby participated in a Tropical Climate Change Workshop in San Juan, Puerto Rico, October 4th-7th.

October 5th-8th, Robin Graham attended the Office of Biomass Quarterly Review in Washington, D.C.

Tommy Phelps and Ji-Won Moon met Tennessee State Senator, Ken Yager, on October 6th. They demonstrated the seafloor process simulator (SPS) and discussed a future fossil energy-related consortium including lab, universities, and TVA, and technology transfer about exploring and recovery of gas hydrates based on gas hydrate formation using the intermediate scale (72 liter) SPS technique.

National Geographic’s JASON project visited Oak Ridge National Laboratory (ORNL) on October 6th, and met with staff including Paul Hanson, Colleen Iversen, and Jeff Warren. During the week, students visited ORNL Climate Change Science sites. Their interviews will become part of a multimedia teaching curriculum available to schools across the country. Learn more at <http://www.jason.org/public/whatis/start.aspx> and <http://www.jason.org/public/cblog.aspx>.

Bob Andres, Alex Kozyr, and Mac Post attended the COCOS (Coordination Action on Carbon Observation Systems) - RECCAP (REgional Carbon Cycle Assessment and Processes) meeting in Viterbo, Italy, October 6th-8th. Each made presentations to the meeting regarding their efforts on behalf of RECCAP.

Shahab Sokhansanj travelled to Emmetsburg, Iowa, during October 6th-7th. The purpose of this travel was to participate in the stage gate review of the DOE-sponsored logistics project "Integration of Advanced Logistical Systems and Focused Bioenergy Harvesting Technologies to Supply Crop Residues and Herbaceous Energy Crops in a Diversified Large Square Bale Format." Christy Sterner organized this review. Other reviewers were Dr. Lyle Stephens (Retired John Deere) and Dr. Matt Darr, Iowa State University. The review included presentations and field demonstrations.

October 7th-8th, Virginia Dale participated in the meeting of the National Academy of Sciences (NAS) Committee on Economic and Environmental Impacts of Increasing Biofuel Production in Irvine, California.

Colleen Iversen organized and hosted a small workshop at ORNL on October 7th-8th, entitled "Advancing minirhizotron use to examine ephemeral root dynamics in peatland and high carbon ecosystems." The workshop was funded by the *New Phytologist* trust and the U.S. DOE Office of Science. The goals of the workshop were two-fold: (1) Develop a consensus on the appropriate installation and use of minirhizotrons in peatlands and similar ecosystems, and (2) Develop a manuscript to be submitted to *New Phytologist* that provides a review of minirhizotron results to date in peatland and other high carbon ecosystems, along with a suggested methodological framework to aid in future minirhizotron implementation in similar systems. Conference participants included scientists from Alaska, California, Michigan, and Pennsylvania, along with Canada, Finland, and the U.K. who use minirhizotrons to examine fine-root production in ecosystems ranging from the arctic tundra to forested bogs. Several ORNL scientists, including Joanne Childs, Paul Hanson, Jeff Warren, Peter Thornton, and Stan Wullschlegel also participated in the workshop.

Jerome Baudry and Jerry Parks were awarded time for protein simulations by the NAS on the special "Anton" supercomputer, designed and built by multibillionaire computer scientist David E. Shaw.

October 12th-14th, Virginia Dale participated in the meeting of the Council on Sustainable Biomass Production (CSBP) in Kansas City, Missouri, and attended the field trip to Show Me Energy <http://www.goshowmeenergy.com/>. Dale, Kline and Langholtz also participated in CSBP Task Force conference calls to discuss progress and issues in preparation for the meeting.

ORNL Distributed Active Archive Center (DAAC) Scientist, Bob Cook, attended the North American Carbon Program (NACP) Science Steering Group and Carbon Cycle Interagency Working Group meeting in Washington, D.C., October 13th-14th. He also participated in the National Snow and Ice Data Center (NSIDC) User Working Group Meeting, Washington, D.C., on October 14th, and gave a presentation on the ORNL DAAC's citation practice and Moderate Resolution Imaging Spectroradiometer (MODIS) Subsetting tools.

Virginia Dale and Mark Downing worked with Audrey L. Mayer of Michigan Technological University as she developed a proposal titled "Regional-scale impacts of bioenergy and carbon sequestration policies for nonindustrial private forest in Michigan and Tennessee" to the Powe Award Program <http://www.ornl.gov/university-partnerships/faculty-student-programs/powe/instructions-faculty.aspx>. If funded, the project would use a computer simulation of two areas dominated by nonindustrial private forests (NIPF; Houghton/Keweenaw County in Michigan and Roane County in Tennessee) to determine whether small differences in the land-management policy preferences of NIPF owners aggregate into significant differences in landscape structure and configuration.

Stan Wullschleger co-organized an October 13th-14th, workshop entitled "Climate Change Experiments in High-Latitude Ecosystems" at the University of Alaska, Fairbanks. The purpose of the workshop was to address uncertainties in ecosystem and climate models and understand the role of observations and experiments in resolving those uncertainties. Rich Norby, Peter Thornton, Paul Hanson, David Graham, and Daniel Hayes from ORNL attended the workshop, as did new DOE/BER Division Director Gary Geernaert and Biological and Environmental Research (BER) Program Managers Mike Kuperberg, Todd Andersen, and Joe Graber. More than 40 participants attended the two-day workshop.

Robin Graham attended the Association of Ecosystem Research Centers (AERC) annual symposium (October 14th) and met with OBP staff on future directions.

October 14th-15th, ORNL contributed to several presentations during a review of preliminary recommendations for the California Air Resources Board on improving regulations related to land-use change under the Low-Carbon Fuel Standard. The Expert Work Group reviewed progress to date in nine sub-groups. The principle presentation from ORNL was titled, "Decomposition Analysis of U.S. Corn Use for Ethanol Production from 2001-2008." Contributions were also made for presentations related to time accounting, land availability, effects of other fuels, food-fuel interactions and emission factors. See <http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>.

Mark Downing attended the 2010 Alternative Fuel Vehicle Odyssey on October 15th, at Pellissippi State hosted by the East Tennessee Clean Fuels Coalition. Mark brought his personal VW Beetle TDI running on B20 and Scott Curran (Energy and Transportation Science Division) brought a Ford Fusion Hybrid from the ORNL fleet, a Saab Biopower ORNL research vehicle and the University of Tennessee at Knoxville (UTK) Challenge X vehicle. Presentations were made by both ECotality and Genera Energy, and many other advanced and alternative fuel vehicles were on display.

The 8th Biennial Short Rotation Woody Crops (SRWC) Operations Working Group Conference was held in Syracuse, New York on October 17th-19th. Presentations given by ORNL include: "Preview of the Billion-Ton Annual Supply Assessment" and "Challenges to mapping yields and modeling production of woody crops" by Laurence Eaton, "SRWC published and reported yields in US poplars, willows & pines" by Lynn Wright, and "Yield, profitability, and optimum harvest scheduling of *Eucalyptus* spp. in Florida" by Matt Langholtz. Mark Downing moderated the Social/Economic Dimensions session.

Scott Retterer has been appointed to an adjunct assistant faculty position with the Electrical Engineering and Computer Science Department at the University of Tennessee.

October 17th-20th, Keith Kline gave a presentation on the Global Sustainable Bioenergy Project at Open Science Meeting of the Global Land Project (GLP) in Tempe, Arizona. GLP is a special project under the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP). Keith participated in several side-meetings including:

- Potential cooperation and synergy on initiatives to address gaps in land-use change modeling for bioenergy (reference data sets, platform comparing models) to be coordinated by the Earth System Science Partnership (ESSP) – an umbrella group linking the four global environmental change programs (IHDP, IGBP, the World Climate

Research Programme [WCRP], and DIVERSITAS, an International Programme of Biodiversity Science)

- Discussions of potential synergy with a new Consultative Group on International Agricultural Research (CGIAR) Climate Change Agriculture Food Security Challenge Consortium Research Program (CCAFS-CRP)

Nagendra Singh and Esther Parish also attended the GLP meeting, and Esther participated in a workshop on land modeling associated with the meeting.

An article on the ORNL DAAC collaboration with the Alaska Satellite Facility (ASF) and the NSIDC related to the synthetic aperture radar (SAR) tech infusion project has been published in the ORNL Climate Change Science Institute September 2010 Newsletter. An electronic version of the letter will be available at <http://www.climatechangescience.ornl.gov/news/>.

ORNL DAAC Developer, Jerry Pan, and DAAC User Operations Manager, Tammy Beaty, attended the 9th Earth Science Data Systems Working Group Meeting, New Orleans, Louisiana, October 20th-22nd.

On October 21st, Colleen Iversen and Jeff Warren were featured in a local news broadcast (WBIR) describing the use of a new experimental system to study ecosystem response to climate change in a high C bog in Northern Minnesota – the Spruce and Peatland Responses Under Climatic and Environmental Change (SPRUCE) project. You can view the news clip online at <http://www.wbir.com/news/local/story.aspx?storyid=139286>.

October 21st, Keith Kline and Debo Oladosu met with Alison Goss Eng and Zia Haq at the Department of Energy (DOE) in Washington, D.C., to review progress and discuss plans for research on Global Feedstock Supply, Modeling and Land Use.

Carol Sanderson, ORNL DAAC metadata specialist, participated in workshops on Simple Knowledge Organization Systems to Help Interdisciplinary Vocabulary Engineering (SKOS-2-HIVE) and Interdisciplinary Vocabulary Engineering, while attending the American Society for Information Science and Technology (ASIS&T) 2010 Conference held in Pittsburgh on Oct 22nd.

Adriane Lochner and her work at ORNL have been featured in the German *Biocatalysis2021* journal. You can navigate to journal's page at http://biokatalyse2021.de/cms/?page=Im_Bestellservice_BIOKATALYSE2021_Clustermagazin and click the link next to the Issue 3 journal cover (direct link: http://biokatalyse2021.de/cms/Content/download/BIOKATALYSE2021_Clustermagazin_3_web.pdf). Adriane appears on page 10.

ORNL DAAC Developer, Suresh SanthanaVannan, attended the A-Train Symposium on the A-Train satellite constellation, October 25th- 28th, New Orleans, Louisiana.

October 27th-28th, Virginia Dale gave a presentation to the National Academies' Roundtable on Science and Technology for Sustainability in Washington, D.C.

The recent article “CO₂ enhancement of forest productivity constrained by limited nitrogen availability” (*PNAS*, available online) by Rich Norby, Jeffrey Warren, Colleen Iversen and others has received much media attention. The article [Trees Not Countering CO₂ Levels](#) appears in *Laboratory Equipment*; Carbon Positive presented the article [Cloud over CO₂ storage in trees](#); the article [Trees' ability to soak up CO₂ has limits](#) was created by the *Australian Broadcasting*

Corporation (ABC); and [Lack of nitrogen will not allow forests to “win” the global warming](#) links to an article in Russian.

October 29th, Virginia Dale met with Alison Goss Eng in Washington, D.C., to discuss ORNL’s research on Bioenergy Sustainability.

Wei Wang has been invited to join the editorial board of the “Journal of Nanoengineering and Nanomanufacturing.”

Carolyn Hoagland, a student at the University of Tennessee in Chattanooga who was selected for the Volkswagen Distinguished Scholars Program at ORNL, is quoted in an article at <http://blog.utc.edu/news/2010/10/volkswagen-selects-utc-interns-featured-in-video/>, discussing U.S. ethanol production.

BESD New Arrivals

Timothy Hendrick II reported to work in October, working as part of the Evaluation & Social Science Research Staff with Amy Wolfe in the Environmental Sciences Division’s (ESD) Renewable Energy Systems Group.

Richard Hurt arrived in October to work as a postdoctoral research associate with Dwayne Elias. Richard will apply, utilize, and develop novel methods toward understanding the interactions between subsurface bacteria and metals, the biotransformation of these metals, the resultant biogeochemistry, and the effect on the microbial community.

R. Trent Jett reported to work in October, working as an Aquatic Ecology Technician with Mark Peterson in ESD’s Earth and Aquatic Sciences Group.

Zhaoqing Jin reported to work in October to work as a Post-Master’s Research Associate with Jay Chen and Jerry Tuskan in the Biosciences Division (BSD). Zhaoqing completed his MSc at the University of Ottawa (Canada) with expertise in plant molecular biology and molecular genetics. He now joins a multi-disciplinary team of investigators undertaking broad, integrated approaches to enhance feedstock characteristics and productivity of bioenergy crops. Zhaoqing is located in Room 114, Building 1506.

Ryan Manger reported to work in October, working as a Radiological Engineer/Physicist with Wilson McGinn in ESD’s Human Health, Risk, & Environmental Analysis Group.

Wellington Muchero reported to work in October, working as a Plant Molecular Biologist/Geneticist with Tony Palumbo in BSD’s Plant Systems Biology Group.

Suresh Neethirajan arrived in October to work as a postdoctoral research associate with Jennifer Morrell-Falvey. Suresh will utilize high resolution imaging techniques to investigate molecular interactions between poplar and bacteria.

Stephen Tomanicek arrived in October to work as a postdoctoral research associate with Liyuan Liang. Stephen’s focus will be on protein expression, purification and protein crystallization research. Specifically he will need to optimize the crystallization conditions to resolve the structure of the bacterial protein OmcA.

HR Information Flash

As most of you are already in the process of completing your performance plan for FY 2011 (reminder – they're due in EPM no later than December 17th), you might find a brief review of performance planning and why we do it useful. Take a minute to review the Performance Planning Training

(<https://portal.ornl.gov/sites/hrd/epm/training/Shared%20Documents/Training%20Decks/Planning.pdf>) in EPM. As always, performance planning starts with a conversation with your supervisor. If you have not already started this conversation, please do that soon.

On the Benefits front

Open Enrollment is now under way and continues through Wednesday, November 24th, at 9 p.m. During Open Enrollment, you can enroll, re-enroll, or make changes to your medical and dental coverage, as well as sign up for Flexible Spending Accounts. It's also a great time to enroll in or update your life and accident insurance coverage. All changes will be effective beginning January 2011.

With the separation of benefits administration now complete, Open Enrollment is being conducted on our new Benefits Enrollment website (<https://ornl.employee.com/oba/login/Login.page>), or call 1-800-211-3622 to enroll or for assistance. Look for your Open Enrollment Guide in the mail and take the time to carefully review your benefit options this year, as well as your dependents and beneficiaries. To log-on to the website, follow the instructions found on the inside back cover of your enrollment guide or on the Benefits Home page.

FSA accounts for 2011 to feature debit card, grace period

Open Enrollment is the time to set up Health Care and/or Child and Dependent Day Care Flexible Spending Accounts (FSA) for 2011. FSA's are a way to save tax dollars on eligible health care and/or day care expenses. Beginning in January 2011, participants in the Health Care FSA will be able to use a debit card to pay for eligible expenses at a doctor's office, pharmacy, vision center and hospital. In addition, we will be reinstating the 2-1/2 month grace period for both accounts, which will allow you to file claims for expenses incurred through March 15, 2012. The grace period allows claims to be filed against any unused balance from the previous year and is intended to help employees avoid losing any money put into an FSA account that has not been spent by the end of the calendar year. For 2011 the maximum contribution to an FSA is \$5000. You can enroll in FSA for 2011 on the Benefits Enrollment website during Open Enrollment, which began Tuesday, October 26, and runs through Wednesday, November 24. More information about FSA accounts and the new Healthcare Payment/debit card can be found on the Benefits Enrollment website (<https://ornl.employee.com/oba/login/Login.page>) under Tools, Resources and Forms for 2011.

New legal services plan

Employees enrolled in Supplemental Life Insurance can receive will preparation (<https://portal.ornl.gov/sites/hrd/benefits/Documents/Open%20Enrollment%202010/Will%20Preparation%20PreEnrollment%20Flyer%20exp1012.pdf>) and estate resolution (https://portal.ornl.gov/sites/hrd/benefits/Documents/Open%20Enrollment%202010/Estate%20Resolution%20Service%20Flyer_exp0612.pdf) services at no additional cost. You may enroll in Supplemental Life during Open Enrollment, or at any time. Evidence of Insurability is required by completing a Statement of Health form, which is available on the Benefits Enrollment website (<https://ornl.employee.com/oba/login/Login.page>).

Working couples: Cancel any duplicate coverage during Open Enrollment

ORNL has a number of working couples where both spouses are employees of UT-Battelle. If you fall into this group, please remember that you cannot have duplicate coverage in the medical or dental plans. In other words, you cannot be covered both as an individual under your plan and also as a dependent spouse under your spouse's plan. This is true for Group Life and Special Accident Insurance, as well. Each employee can elect basic life, but you cannot cover your spouse under spouse life if he or she is covered under the basic plan. Life insurance coverage levels are greater and your rates are lower as an employee rather than as a spouse.

For Special Accident, both spouses cannot carry family coverage; one employee could elect family coverage to cover all dependents, both employees could elect single coverage, or one employee could elect family coverage to cover eligible children and the other employee could elect single coverage. To determine which coverage option is best for you, refer to the benefit amounts in your Book of Benefits (<http://benefits.ornl.gov/bob/life-accident-coverage/special-accident-insurance.htm>).

During Open Enrollment, it is important for you to check your levels of coverage and waive any duplicate coverage to avoid paying unnecessary premiums. Visit the ORNL Benefits Enrollment website (<https://ornl.employee.com/oba/login/Login.page>) to make your changes, or call the ORNL Benefits Service Center at 1-800-211-3622.

Quality Counts (a message from your BESD Quality Manager, Karen Sabo, 1505/252, 574-4398)

October's topic is **Maintaining an A+ Lab Notebook**. As a Researcher, you are responsible for the Quality Assurance (QA) of your data and using a permanently bound notebook is preferred. Reasons for keeping your notebook accurate and up-to-date . . .

1. Your notebook is the original ORNL/DOE recognized record of your scientific investigation
2. Preserves data & observations for future reference and reproduction
3. Provides an organized resource & saves time when writing technical papers & reports
4. Recognized as an evidence tool for invention disclosures / patent applications

Does your Notebook make the grade? QA is all about establishing confidence in reported data. Now, take 2 minutes to review ORNL's instructions for maintaining an A+ Lab notebook, then give yourself credit for the Quality job you do.

<https://sbms.ornl.gov/sbms/sbmsearch/subjarea/recmgmt/notebook.cfm>

To register your notebook (*optional*) with the ORNL Records Center contact Karen Vogel, vogelka@ornl.gov