

**The Center for BioEnergy Sustainability (CBES)
At Oak Ridge National Laboratory (ORNL)**
is pleased to announce that we are holding a SPECIAL Forum on May 21st, 2012 in
the Ocoee Room (Room 189) in Building 1505 at 3:30.

Forum topic is:

**“Coupling GIS and economic data into land use models:
The Brazilian Land Use Model experience”**

Guest Speaker:

Marcelo M.R. Moreira

Institute for International Trade Negotiations – ICONE, Brazil

Abstract:

Since the end of 2007 the Institute for International Trade Negotiations (ICONE) has been working on improving the methodologies used for measuring the impacts of the expansion of the agricultural sector on land use in Brazil. The main purpose of this research agenda is to quantify direct and indirect land use changes (LUC and iLUC) of agricultural-based biofuels in general and sugarcane ethanol in particular. In a partnership with the Center for Agricultural and Rural Development (CARD, Iowa State University), ICONE’s research team developed an economic model called Brazilian Land Use Model (BLUM) to simulate supply and demand of agricultural products produced in Brazil and its impacts on the demand for land. Because BLUM is integrated to FAPRI’s world models (FAPRI, 2010)¹ it is possible to simulate the responses of the Brazilian agricultural sector to changes in world prices.

Economic models require constant updates of data, parameters and assumptions. A key issue regarding ICONE’s research agenda on land use was to improve BLUM’s land allocation and competition section - land use module – incorporating new data, recalibrating parameters and revising assumptions that determine equations used in the model. Through the combination of data generated in the context of the deterministic methodology, remote sensing data assessing Cerrados biome conversion to annual crops and pastures (Ferreira et al., 2011)², data on Amazon, and Atlantic Forest biomes deforestation and data on the agricultural sector’s per hectare profitability listed in BLUM, ICONE was able to update and improve BLUM’s land allocation and competition section.

The improvements accomplished in BLUM’s land use section will be discussed during the presentation as the main achievements of the project “Simulating Land Use and Agriculture Expansion in Brazil: Food, Energy, Agro-industrial and Environmental Impacts”.

The establishment of parameters and assumptions that govern land allocation for BLUM’s agricultural sectors based on real data is a key methodological contribution of this project. Land supply elasticities (response of total agricultural land to changes in market returns) and cross-area elasticities (response of the area of a certain agricultural use to changes in the return of another use) were recalculated using historical data of land use changes from satellite images, rather than based on secondary data only. The assumptions that drive the contribution of individual agricultural sectors to the conversion of the agricultural frontier, as well as those that govern the competition among agricultural uses, were also revised based on evidences from remote sensing data and satellite imagery.

¹ FAPRI. 2010 U.S. and World Agricultural Outlook. Food and Agricultural Policy Research Institute. FAPRI Staff Report 10-FSR 1.

² Ferreira, M. E.; Silva, J. R.; Rocha, G. F.; Antoniazzi, L.; Nassar, A.; Rocha, J. C. S. Caracterização das áreas desmatadas no bioma Cerrado via sensoriamento remoto: uma análise sobre a expansão de culturas agrícolas e pastagens cultivadas. XV Simpósio Brasileiro de Sensoriamento Remoto (submitted and accepted). This reference is listed in item V as a publication resulting from this project.