

Welcome note to the 38th Biological Systems Simulation Group Meeting

Welcome to the 38th Biological Systems Simulation Group Meeting, and to the Blackland Research and Extension Center. This year's meeting brings together researchers with expertise in modeling from multiple disciplines to discuss common issues regarding natural and agricultural systems modeling.

The theme of this year's meeting is "*Applying Basic Science to Challenges in Energy Supply and Natural Resources Conservation*". The complexity of agricultural and natural systems management and their social, environmental and economic interactions poses challenges for scientists, stakeholders and policy makers. The potential of these systems as sources of biofuel has increased the need to understand the limits of biomass production and its composition, and the impact of bioenergy production on environmental integrity at both field and watershed levels. Rangelands, which occupy a significant part of the US and the world, pose a challenge for simulating plant communities that, unlike homogenously managed crops, have extreme spatial variation at several scales. Climate change poses a challenge in understanding plant responses to biotic and abiotic factors affecting plant productivity particularly under extreme events such as temperature stress. In this context, the role of simulation modeling in addressing issues of energy supply and natural resources conservation is difficult to overstate.

We hope this workshop will help the modeling community focus their innovative modeling efforts in important issues for science while addressing critical issues for society. Three scientists who are leaders in their respective disciplines will make presentations. Mark Wertz (USDA-ARS Reno NV) will discuss vegetation and soil related processes in rangelands, Bruce Kimball (USDA-ARS Maricopa AZ) will talk on the interactive effects of Global Change, and Cesar Izaurralde (Joint Global Change Research Institute, College Park MD) will discuss issues on scaling up global Change effects from field to watersheds. On the night of Wednesday 9th April, the meeting will host a dinner at The Ranch, in Temple. Don Gohmert, the USDA-NRCS State Conservationist for Texas will provide the agency perspective on the challenges facing natural resources conservation in Texas and the nation, and the role of simulation models in addressing those challenges.

Visits to the CO₂ gradient experiment and to runoff plots are scheduled for Thursday, 10th April to provide participants a flavor of the field research at the Station. We hope you enjoy and find this meeting productive.

The 38th BSSG Organizing Committee
8th April 2008, Temple TX

Armen R. Kemanian, Texas AgriLife Research
Jim R. Kiniry, USDA/ARS
Wesley Rosenthal, Texas AgriLife Research
Colleen H. Rossi, USDA/ARS
Philip A. Fay, USDA/ARS
Yubin Yang, Texas AgriLife Research
William Fox, Texas Water Research Institute

38th Biological Systems Simulation Group Meeting Agenda
8th – 10th April 2008, Temple, TX

Day / Time	Activity / Presentation Title	First Author
Tuesday, 8th April		
8:00 AM	Registration	
8:00 AM	Breakfast	
8:40 AM	Meeting presentation	Tom Gerik / Armen Kemanian
9:00 AM	Modeling rangeland plant growth: future directions to meet customer needs	Mark Wertz
9:30 AM	Economic implications of maintaining rangeland ecosystem health in a semi-arid savanna	Richard Teague
10:00 AM	Challenges in applying the APEX model for the CEAP National Cropland Assessment	Jay Atwood
10:30 AM	Coffee break	
10:50 AM	Web-based simulation models and calculators for support of agronomic research and crop management	Carlos J. Fernández
11:10 AM	Development of a crop production system evaluation platform for key food staple crops	Jawoo Koo
11:30 AM	Water quality protection alternatives in Bosque River watershed	Pushpa Tupad
12:00 PM	Lunch	
1:00 PM	Interactive effects of Climate Change: from field to watershed levels	Cesar Izaurrealde
1:30 PM	Robust methodologies for simulating potential impacts of climate change on crop production and resource management	Jeffrey White
2:00 PM	Nonlinear grassland dynamics along a CO ₂ gradient	Stefano Manzoni
2:30 PM	Coffee break	
2:50 PM	Plant biochemical shifts under varying nitrogen conditions: Implications for the Carbon Cycle	Morgan Gallagher
3:10 PM	Investigating the physiological basis for rice heterosis: Implications for process-oriented simulation modeling	Lloyd T. Wilson
3:30 PM	TBD	
3:50 PM	Simulating the effects of growing season length and irrigation practices on cotton growth and yield	R.Louis Baumhardt
4:10 PM	Discussion	
5:00 PM	Adjourn	
Wednesday, 9th April		
8:00 AM	Breakfast	
9:00 AM	Interactive effects of Global Change	Bruce Kimball
9:30 AM	Quantifying the effects of temperature and nitrogen on switchgrass growth and development	K. Raja Reddy

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10:00 AM	Simulating biofuel grasses, coastal bermudagrass, and native range grass species in rainfall limited locations	Jim R. Kiniry
10:30 AM	Coffee break	
10:50 AM	An open system for measuring canopy gas exchanges	Jeff T. Baker
11:10 AM	Quantifying leaf expansion and canopy development in potato as a function of nitrogen and CO ₂	Dennis Timlin
11:30 AM	Effect of soil moisture on peanut growth and development	Celia M. Tojo Soler
11:50 AM	Updating parameters of the CROPGRO-tomato model for predicting growth and dry matter accumulation	M.Raquel Rybak
12:10 PM	Lunch	
1:00 PM	Effects of potassium nutrition on physiological processes and derivative spectrum characteristics of corn plants	Yang Yang
1:20 PM	Use of CEEOT-SWAPP modeling system for cost-effective targeting and evaluation of environmental pollutants	Ali Saleh
1:40 PM	Simulating greenhouse gas fluxes of typical sorghum cropping systems in central and south Texas.	Norman Meki
2:00 PM	Web-pased post-harvest grain management	Yubin Yang
2:20 PM	Coffee break and posters display session	
3:00 PM	Cautionary notes on the use of the Rawls et al. (1982) soil hydraulic pedotransfer functions	Attila Nemes
3:20 PM	Potential impacts of increased bio-fuel production in Missouri: Erosion, nutrient loss, and carbon sequestration	Verel Benson
3:40 PM	Discussion	
4:40 PM	Adjourn	
6:30 PM	Dinner at The Ranch (Temple) Speaker: Don Gohmert, NRCS Texas Soil Conservationist	

Thursday, 10th April

8:30 AM	Roundtable 1: Bioenergy in the agricultural landscape	
8:30 AM	Roundtable 2: Global Change across scales	
9:30 AM	BSSG Meeting: Group organization and future meeting	
10:00 AM	CO ₂ gradient experiment overview	Wayne Polley / Phil Fay
10:15 AM	Coffee Break	
10:30 AM	Visit to the CO ₂ gradient experiment	Wayne Polley / Phil Fay
12:00 AM	Lunch	
12:40 PM	Runoff plots research overview	Dennis Hoffman et al.
1:00 PM	Visit to runoff plots research	Dennis Hoffman et al.
2:30 PM	Meeting adjourn	

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Wed 2:20 –
3:00 PM

Poster Titles

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| Poster: Evaluating an inverse solution for crop stress factors in Kansas water budget | Rob Aiken |
| Poster: Ranch specific decision support system to simulate forage growth and determine risk – FRAMS | Kristen Zander |
| Poster: Planting date forecast for cotton using minimum and maximum air temperature | Prasad H. Gowda |
| Software Demo: CTP–NGL: A model of nitrogen gaseous losses from crops | Fulvio M. Rivano |
| Software Demo: Comparison of one-dimensional soil water and solute transport models of different levels of detail | Fulvio M. Rivano |
| Poster: Simulation modeling of runoff and sediment losses for integrated crop tillage systems | Devanand Maski |