

## NREL NEWS NOTES

*NATURAL RESOURCE ECOLOGY LABORATORY*  
*Colorado State University*

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### Spotlight on Science

**Featuring: Kathy Galvin Sr. Research Scientist - Natural Resource Ecology Laboratory**

Kathy Galvin recently returned from a workshop on "Reducing Climate-Related

Vulnerability" in southern Africa held in Victoria Falls, Zimbabwe (Oct.

1-4), sponsored by NOAA and NASA. It is well known that El Nino Southern Oscillation (ENSO) affects the pattern of short-term climate in southern Africa. Now successes in model-based ENSO forecasting means that, soon, predictive capabilities in rainfall events will be enhanced. Discussed at the workshop was utility of those forecasts for southern Africa, how sectors such as agriculture (commercial and subsistence), food security, health, and water could use these forecasts, and what is needed from the forecasting side and the user side.

Climate variability, human land use and human behavioral and biological adaptations characterizes much of Kathy's research in Africa. She has worked in Kenya, Ethiopia, Tanzania and most recently in South Africa. In South Africa, she and Jim Ellis worked for the Centre for African Ecology, University of the Witwatersrand, where they established a program in Resource Conservation and Human Development. With this program, students in conservation biology could be exposed to poor, high-density rural populations as well as the tremendously rich wildlife communities these people live next to. While in South Africa, Kathy also directed the work of Ashley Till, a CSU Anthropology graduate student who studied natural resource use in a rural African village. Kathy also did a nutritional survey in two African villages, one Shangaan and the other, a Mozambican refugee village, for the Health Services Development Unit, Medical School, University of the Witwatersrand.

With the focus still on Africa, Kathy is a member of a team (Mike Coughenour, PI Dave Swift Dennis Child and Larry Rittenhouse, RES Jim DeMartini, Pathology Ann Magennis, Anthropology James Else, Advisor to the Ugandan government Robin Reid, ILRI, Terry McCabe, CU and Paul Rwambo, Kenya) who just received funding (Oct. 1996) from USAID -SR-CRSP to plan and build a team to develop a system to link livestock development with biodiversity conservation in spatially extensive pastoral ecosystems in East Africa.

On other continents Kathy is directing graduate student Jill Lockett (Anthropology Dept.) on the NIH funded project, "Population and Environment in the Great Plains" (Bill Parton, Kathy Galvin, PIs). Besides building a demographic and social change component to add to the Century model, this project also has a goal to survey farm families about their land use decisions. It is this component of the project for which she and Lenora Ohren (Industrial Sciences Dept.) have responsibility.

Land use decisions are the subject of another research project Kathy is working on, this time in Mongolia and northern China. PIs on this NSF funded project are Jim Ellis, Mike Coughenour, Kathy Galvin and Jim Tucker (NASA). The overall goal is to develop an integrated assessment methodology for exploring the interactive effects of climate change and land use on dryland ecosystems. Kathy's role is to document, along a rainfall/land use gradient, land uses and household economy. This information will be combined with GIS data layers and remote sensed imagery in Savanna model simulations aimed at assessing climate/land use effects on ecosystem stability and resilience.

Kathy attributes her ability to be involved in human ecological projects to the strong interdisciplinary nature of research at the NREL.

## **NREL Research in Mongolia**

In July and August, Dennis Oima with Chuluun Togtohyn, Jim Reardon -Anderson, Larry Tieszen, and Bruce Wylie travelled in China and Mongolia collecting soil and plant samples for their NSF funded project. While in China, the group made presentations at the International Conference on Temperate Grasslands for the 21st Century in which Dennis Oima served as a member of the Academic Program Committee. Dennis and Chuluun presented a paper titled "Grassland Ecosystems Dynamics and Global Change Effects." After the conference, the group was joined by Ms. Angfen Wang, who visited NREL last May, and who served as our guide in Shaanxi and Inner Mongolia Provinces of China. They traveled to Ulin, China, infamous for the encroaching sand dunes that threaten the croplands in the region, and into Inner Mongolia and the cities of Hohhot and Ulanhot. They stayed at the Inner Mongolian Grassland Ecosystem Research Station, a Chinese Ecological Research Network Site and were hosted by Professor Chen Dhouzhong, and visited other experimental stations along the way and collected soil and plant samples for C1 isotopic analyses.

In late July, we departed China to travel into Mongolia where Chuluun had arranged for several sampling trips into northern and eastern Mongolia. Our first trip took us to an agricultural study area north of Ulan aataar in the Selenge River basin. This area represented a mixed land use region of forestry, cropland, rangelands and mining. This area was also devastated by the fires which occurred

last spring. Following this trip, they ventured into eastern Mongolia, visiting various research sites that were protected from grazing and served as experimental sites in the past. The current status of these sites are not promising due to the economic hardships currently being experienced in Mongolia. They also visited the Japanese research site south of Ulan aatar (organized by Dr. oshiaki Honda), and were treated to a night of singing and celebrating the international efforts and very warm hospitality that the Mongolian government and scientific community provided.

This trip to Asia was made a success due to help provided by the Chinese and Mongolian scientists. Especially helpful in China were: Professors Chen Dhouzhong, Zhao Shidong, Song ingy, and Ms. Wang angfen. In Mongolia, in addition to the energies of Chuluun, Professor Erdenav, ataar, Chognyya were instrumental in facilitating the logistics and providing invaluable information about the local ecological and land systems of Mongolia. The future research efforts will continue to prosper with the continued collaborations with these individuals and the continued support of their efforts.

## Announcements

Dr. Chuluun Togtohyun has been appointed as the Adviser to the Minister of Nature and Environment of Mongolia on foreign cooperation. Chuluun will be working at NREL for three more years.

Indy urke testified to the Senate Subcommittee on Science, Technology, and Space, Sept. 1, in a hearing on computational biology. She spoke on why ecosystem ecologists need intensive computational resources.

Dave Schimel was appointed to the Science Advisory board of the National Center for Ecological Analysis and Synthesis.

Georg Guggenberger has returned home to ayreuth, Germany after working at NREL for the last year with Keith Paustian and Ted Elliott on their soil organic matter (SOM) proect. Georg will be working with NREL in the future on additional research collaborations.

The New Ecologist Lecture Series will be co-sponsored by NREL and GDPE. Speakers must be graduate students within 2 years of their Ph.D.s or recent Ph.D.'s. Speakers are:

- Oct. 4: Christien Ettema, Institute of Ecology/io - science, U. of Georgia, Athens
- Nov. 1: Sara Hotchkiss, Dept. Ecology, Evolution, and ehavior, U. of Minnesota, St. Paul
- Nov. 22: Patrick ohlen, Institute of Ecosystem Studies, Millbrook, N

## Meetings

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ob Niles participated in the iennial Agricultural Research Field Day on Sept. at the Arkansas Valley Research Center at Rocky Ford. He had a display and discussed his research on alfalfa stem nematodes.

John Gross, Tom Hobbs and Dave Theobald hosted a Regional Design meeting to receive input on the design and use of a system to support decisions on land use relating to species conservation, especially for elk. This meeting was funded by the Rocky Mountain Elk Foundation, and was an initial task in the collaborative design phase of the project. The goal of the project is to develop a decision - support system to be used by planners, citizens, and other organizations to evaluate the effects of development on wildlife. Participants were from the Rocky Mountain Region and included agency personnel, ranchers, planners, and citizens.

The Western Regional Meeting of Nematologists was held at the Lory Student Center on Oct. 4. Approximately 26 nematologists attended the two day meeting on biology, ecology and introductions of plant parasitic nematodes into crops and other topics and toured the NREL on Oct. rd.

A meeting on "Bioregional Approaches to Agriculture" was held at the Natural Resource Ecology Laboratory on Oct. 9. Among those attending were Acting Under Secretary for Agriculture, Cathie Woteki, top administrators of USDA, scientists and economists. The meeting was the result of a USDA grant to Diana Freckman. Co-organizers of the meeting were the former Under Secretary of Agriculture, Karl Stauber, and Counselor for Biodiversity and Environmental Affairs at the Smithsonian (and NREL External Advisory Committee member), Tom Lovejoy. Ted Elliott and Bill Parton were speakers. Ted's presentation was "A Bioregional Approach for Integrating Agriculture Research" and Bill's was "Climate Change and Sustainable Agriculture."

## **N E T W O R K I N G**

Keith Paustian and Kendrick Killian spent a week at Michigan State University working on their project, together with Prof. Joe Ritchie, developing the Systems Approach to Land Use Sustainability (SALUS) model. The model is a daily based crop growth/water balance/biogeochemistry model designed to simulate complex cropping systems (e.g., rotations, intercropping), including a variety of management factors and pest influences. Also participating was Dr. Jim Jones (U. of Florida) who is interested in incorporating their generic grain legume model into SALUS.

The annual ESA Conference was held Aug. 10-14 in Providence, RI. NREL attendees were: Eric Allstott, Richard Alward, Jill Aron, Indy Urke, Dan Inkley, Geneva Chong, Deb Coffin, Mike Coughenour, Diana Freckman, Melannie Hartman, Eth Holland, Bill Lauenroth, Robin Martin, Dan Milchunas, Tamera Minnick, John Moore, Brian Newkirk, Dennis Oima, Andy Parsons, Dave Schimel, Frank Singer, Tom Stohlgren, Ecky Techau, and Bob Woodmansee. Many presented talks or posters. The meeting, with 600 registered participants, was a great success. Jill Aron served as Program Chair for the five society combined meetings of the Annual ESA, the Society for Conservation Biology, the American Society of Naturalists, the Association for Tropical Biology and the International Society for Ecological Modeling.

Jim Gibson, Dave Igelow, Jim Slusser, and Bill Durham presented a poster at the International Radiation Symposium - IRS '96 - held in Fairbanks, AK, on Aug. 19-24. The poster described the status of the UV Monitoring Program and presented the latest data from the new UV instrumentation now being installed at network sites. In addition to UV measurements, the data makes possible the calculation of total column ozone (stratospheric plus tropospheric) which is now measured at a relatively few sites in the U.S.

Ted Elliott and Keith Paustian traveled to Bozeman, MT, to meet with Drs. John Antle and Susan Capalbo at Montana State University on Sept. 4. The meeting was held to discuss the beginning of the new NIGEC project "Spatially Explicit Projections of C Dynamics with Global Change in the

Central United States." The project will integrate ecosystem and economic models of agriculture in the Great Plains to better our ability to make projections of the impact of climate change on economic factors and carbon storage.

David Theobald attended a conference on "Regional Habitat and Species Conservation Planning" Sept. in Sacramento, CA. On Sept. 6, he discussed land use change prediction and impacts on biological diversity in California with Dr. Adina Merenlender, Environmental Science, Policy and Management Program, University of California, Berkeley.

Keith Paustian and Ted Elliott met with state and federal agriculture and conservation officials Sept. 9 in Des Moines, Iowa to begin a new project to evaluate the potential for different conservation practices to store C in agroecosystems in that state. It is expected that this newly funded Natural Resource Conservation Service project will lead to the evaluation of agriculture conservation practice effect on storage and C in at least three other states (California, Washington, and Texas).

Jeff Welker was invited to present a seminar on Sept. 1, at the University of Wyoming on a seminar titled "Arctic Plant and Ecosystem Responses to Changes in Winter and Summer Climates."

Jill Aron attended a Chapman Conference in Nitrogen Cycling in Forested Catchments in Sunriver, OR, Sept. 16-20. She and Eric Alstott presented a poster on preliminary results of the nitrogen fertilization experiment they are conducting in Colorado titled "Comparison of Foliar and Forest Floor Chemistry between Areas of High and Low Nitrogen Deposition in the Colorado Rocky Mountains: Preliminary Results."

Susan Smith attended the CAL Site Operator Training at Champaign/Urbana, IL, Sept. 1 -20. She presented a talk on the NADP Coordination Office and its responsibilities.

Diana Freckman attended the Costa Rica ATI TWIG meeting in Baltimore/Washington, DC area, Sept. 20-22, and then attended a Scientific Advisory Board (SA) meeting at the National Center of Ecological Analysis and Synthesis, Santa Barbara, CA, on Sept. 24 -2

Jill Aron was an invited participant in a National Science and Technology Council workshop on National Environmental Monitoring and Research, Washington, DC, Sept. 2 -2.

Ted Elliott served as an external reviewer of the USDA NRCS Soil Survey Laboratory in Lincoln, Nebraska on Sept. 16. Ted was also asked to make the keynote presentation which was titled "The Need for Soil Databases in Ecological Research."

Dave Schimel is once again a lead author for the IPCC, this time leading a group preparing a technical paper for the IPCC on "Stabilization of Greenhouse Gases: Physical, Biological and Economic Considerations." The technical paper links modeling of the global carbon cycle, methane, nitrous oxide and sulfate aerosols to climate to estimate impacts, and to the costs of reducing carbon dioxide emissions to estimate impacts on the global economy. Co-authors include Tom Wigley of NCAR, Rich Richels from EPRI, Wandera Ogana of the University of Nairobi, and GDPE student Elizabeth Sulzman. So far, the highlight of the process was when the authors were ejected from their Boston University meeting rooms after the sub-basement below them filled with 9 feet of water, shutting off power and computers, and giving the authors a first-hand appreciation for climate impacts.

Keith Paustian attended the all-investigators meeting for the Great Plains Center of the National Institute for Global Environmental Change (NIGEC) on Oct. 9-10 in Nebraska City, Nebraska. Keith presented a synopsis of results from the existing project "Regional Projections of C Dynamics with Global Change in the Central U.S.," authored with Ted Elliott and Vern Cole, and plans for the renewal project which will include an economic analysis component, in collaboration with

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