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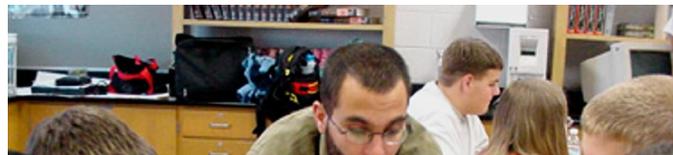
March 2003

**Colorado Front Range GK-12 Project****NREL in the Limelight****Awards****Appointments****Special Publications****Happenings****Grad Student News****Visitors****People****Gifts to NREL****COLORADO FRONT RANGE GK-12 PROJECT**

The Colorado Front Range GK-12 Project, funded by the U.S. National Science Foundation, is a joint effort of the University of Northern Colorado, Colorado State University, Weld County and Poudre School Districts, and other collaborators. The theme of the project is "human impacts on ecosystems along the Front Range." The project provides funding for graduate students (the GK-12 Fellows) at the two universities to be involved in curriculum development and delivery within the local public school systems. It also funds summer research opportunities for public school teachers to enhance their understanding of the scientific process. The emphasis is on ensuring that public school students (and their teachers) are exposed to experiences in the field, making learning a hands-on, interactive, question-driven experience. This brings the excitement of university research into public school classrooms and forms links between the universities and the school systems. John Moore of UNC and Dave Swift of CSU are both NREL scientists and Principal Investigators on the GK-12 Project. Fellows are involved in a variety of science classes at all levels within the school systems.

One of the project's strengths is that it fosters lasting links between schools and community partners. For example, the Leshar Junior High water quality education program at Spring Creek is a collaborative project that involves the Discovery Center Science Museum, Project Watershed, the City of Fort Collins' Master Naturalist Program, and GK-12 fellows. This project also fosters partnerships between classrooms at different schools. In the fall of 2002, fourth graders from Christa McAuliffe Elementary School were mentored by Rocky Mountain High School students during a field trip to a local prairie dog town. GK-12 projects also try to take advantage of local natural areas as field sites which teach students about the ecology of the Front Range and the value of our natural resources.

A recent project with Loveland High School is another good example of the way the GK-12 project works. In January, we created a module dealing



with winter ecology that gave students exposure to professional scientists and provided an opportunity to conduct field research. This project was designed to be short, hands-on, and tied to the State of Colorado's learning standards. Students in Honors biology classes spent a week immersed in the winter ecology of the Rocky Mountains. The first part of the module required students to spend time researching such winter ecology terms and topics as subnivean space, Krumholtz effect, and hibernation. Next, students listened to presentations about winter ecology research by guest speakers from CSU, the U.S. Fish and Wildlife Service, and the Rocky Mountain Bird Observatory. After hearing about real research, students were required to design authentic research projects of their own. Students were shown numerous pieces of field equipment, given descriptions of field sites available to them, and were mentored by GK-12 fellows as they planned group research projects. The highlight of the project was a field trip to the MCA of the Rockies where the students conducted their research projects. Projects included a comparison of the water chemistry of the Big Thompson and Clear Creek Rivers, an examination of the tree species used or avoided by beavers, and an examination of relative heat loss by using baked potatoes (simulating small mammals) in various microhabitats. GK-12 fellows and volunteers from NREL mentored the students during their field trip. To cap off the experience, students wrote summaries of their projects and completed a post-assessment of the effectiveness of the module as a teaching tool. Feedback from the teacher and students was overwhelmingly positive. The students demonstrated an improved understanding of scientific methods and ecological concepts, while also having a great time. Experiments that the students created were fun, exciting, and hands-on. GK-12 fellows are now packaging the protocols from the experiments so that they can be used by other schools in our area.

### NREL IN THE HIGHLIGHT

#### SGS and NREL Establish the National Institute of Native Species Science

**Tom Stohlgren**, and other scientists from NREL and the Fort Collins Science Center, established the first national-scale institute to document, map, and predict the distributions and effects of non-native plants, animals, and diseases in the US. They have developed long-term partnerships with NASA to greatly increase the speed of predictive spatial models for forecasting invasive species distributions using high performance computing. In partnership with the USFWS National Wildlife Refuge System, they are now completing the first phase of a 5-year program. NREL researchers are working with the Colorado Agricultural Experiment Station to improve mapping of invasive plant species in Colorado. NREL researchers have recently established the NII (National Biological Information Infrastructure) Invasive Species Information Node <http://invasivespecies.nbi.gov/>.

**Niall Hanan**, NREL Research Scientist, organized a workshop on African savanna ecology, funded by his NSF project "biocomplexity in African Savannas." The workshop took place in South Africa in January with about 30 participants, including leading African savanna ecologists from Africa, the US, and Europe, as well as graduate students and managers. Products from the workshop include on-going analyses of continental-scale patterns that contrast savanna ecology and dynamics in the different regions of Africa, and a special section on African savannas planned for the *Journal of Biogeography*.



### AARDS

Ellen Wohl, Dept. of Earth Resources, CSU and **Daid Merritt**, Research Scientist of NREL and the Stream Systems Technology Center of the USFS Rocky Mountain Research Station have been

awarded the G.K. Gilbert Award for their paper “edrock Channel Morphology, ” Geological Society of America ulletin, v. 113, number 9, Sept. 2001. This award is presented by the Geomorphology Specialty Group of the Association of American Geographers “... to the author(s) of a significant contribution to the published research literature in geomorphology during the past 3 years.”

**Jeff eler** , NREL Research Scientist, was awarded 420,000 for a 3 - year project from DOE-NIGEC/Univ. of Nebraska for “Mixedgrass Prairie Response to Simultaneous Changes in Winter and Summer Climate.”

### APPONTMENTS

**Jill aron** , USGS and NREL Research Scientist, was appointed to the National Park Service Northern Colorado Plateau Inventory and Monitoring Science Advisory oard.

**Diana all** , NREL Director, has been elected Chair of the Council of Scientific Society Presidents.

### SPECIAL PLCATONS

**Rich Conant**, NREL Research Scientist, wrote a section on grazing lands for the new Encyclopedia of Life Sciences entitled Graer -Dominated Ecosystems ([www.els.net](http://www.els.net)).

**Stohlgren T.J.** , T.T. eblen, K. Kendall, W.L. aker, C. Allen, A. Logan, and M. Ryan. 2002. The heart of the Rockies: Montane and subalpine ecosystems. Pages 203-21 In: Rocky Mountain Futures: an Ecological Perspective. **J. aron** (ed). Island Press.

In a paper entitled “The Rich Get Richer: Patterns of Plant Invasions in the United States,” USGS/NREL scientist **Tom Stohlgren** and coauthors **Daid arnett** (NREL Research Associate) and John Kartes (iota of North America Program, Univ. of North Carolina) summarie two large, independent datasets to show exactly the opposite pattern. At multiple spatial scales, but more significantly, at larger spatial scales, hotspots of native plant diversity have been far more heavily invaded than areas of low plant diversity in most parts of the US. The findings suggest that hotspots of native plant species richness are unlikely to repel invasions, and that the threats of species invasion are significant and predictably greatest in species-rich areas. The work was published in the inaugural issue of “Frontiers in Ecology and the Environment,” a new journal of the Ecological Society of America.

### HAPPENNGS

**Dan inle** , NREL Research Scientist and Professor, Forest Sciences, attended the annual meeting of the rail Eucalyptus Potential Productivity (EPP) Project in Aracru, rail. This project is a collaboration between the Univ. of Sao Paulo, six forest companies, the US Forest Service, and CSU, and it aims to identify the limits imposed by stand structure, resource use, and stand age on the maximum growth of Eucalyptus.

**Jill aron** and **Alan Coich** , Dept. Of Fishery and Wildlife iology/NREL, are organiiing the “Conference on Consequences of Prolonged Severe Drought to Aquatic Ecosystems and Water uality in the South Platte asin ” to be held April 3-4, 2003. Potential consequences will be explored, both in the context of drought, and current and future societal demands on water resources.

**Rich Conant** presented “Modeling Greenhouse Gases in Rangelands: Influence of Improved Management” at the annual meeting of the Society for Range Management in Casper, W.

**Tom Hobbs**, NREL Research Scientist, was a isiting Scholar at the Univ. of Rhode Island in March presenting a seminar and workshop on “Model Selection as an Alternative to Hypothesis Testing in Ecology.” In January, Tom gave a presentation to the Grand Teton National Park and the National Elk Refuge on "Modeling Alternatives for Elk Management" and he gave a presentation to the Point Reyes National Seashore staff on “Regulating Abundance of Wild Ungulates Using Fertility

Control.” Tom also had the privilege of giving the Fall Commencement Address for the CSU College of Natural Resources.

**Jill Lacett** , NREL Research Associate, with Gary Peterson, Professor, Dept. of Soil and Crop Sciences, presented “Preparing for a Changing Climate: Adapting to Climate variability in the Central Great Plains,” at the 39th Annual Colorado Farm Show in Greeley, CO in January. This presentation was based on results from **Dennis Ojima** s (NREL Research Scientist) Central Great Plains Climate Change Impacts Assessment project, funded by the US Dept. of Energy.

**Diana all** attended the Detritus Working Group, NCEAS, Santa Barbara, CA the National Research Council Committee - Frontiers in Polar Genomics, in Washington, DC and the U.S. National Committee on Soil Science in Indianapolis, IN. Diana presented a talk on “Soil biodiversity and Ecosystem Functioning” for the Island Press board in Washington, DC. She also lectured on “Soil biodiversity and Global Change ” as part of a workshop for South American graduate students in Chamela, Mexico. Diana gave the plenary address at the 2003 British Ecological Society Annual Symposium on Soil biodiversity and Ecosystem Functioning in March.

**Jeff eler** attended the NSF-ARCSS LAII synthesis workshop in Victoria, Canada and the NSF - Arctic System Science Workshop in San Francisco.

Sayat Temirbekov from Kazakhstan, Sarah Walker from Virginia, and **Anita Leah** and **Tom Rile** from NREL attended a CENTUR modeling workshop conducted by **Cind Keough** , **Dennis Ojima** and **Stephen Del Grosso**, NREL, in February.

In the fall of 2002, NREL donated six used computer monitors to the Lab School for Creative Learning, an elementary “choice” school which focuses on experiential and environmental learning within the Poudre School District. NREL Research Associate, **Gar ocner** , organized the donation. The school was very grateful for the monitors as they are used every day by students.

### GRAD STUDENT NEWS

**Stee DelGrosso** gave a successful PhD defense on November 5, entitled “Refinement, Testing, and Application of the DACENT Model to Investigate Ecological Impacts of Agriculture. ” His advisor is **Bill Parton** , NREL Research Scientist.

**Joce Dicens** was successful in her November 2 MS defense, entitled “Hydrologic, Geomorphic and Climatic Processes Controlling Willow Establishment in Rocky Mountain National Park, Colorado.” Her advisor is **Tom Hobbs**.

PhD students (**Diana all** advisor), **Mar St. John** and **Todd ojtovic** successfully passed their preliminary PhD exams.

### Please welcome our new grad students

**Silvio Ferrá** , a PhD student from the Univ. of Sao Paulo, Brazil, is studying water quality changes due to forest landscape changes. Silvio is visiting with **Daid Theobald** , NREL Research Scientist/Dept. of Natural Resources, Recreation and Tourism, through early Fall 2003.

**Khishigbaar Jamianshara** , **Dennis Ojima**, advisor, comes from Mongolia. She graduated from Mongolian State Univ. in 1995 as a chemical technologist. She would like to conduct research on the Mongolian urban air quality issue.

**Tom Stohlgren** is advisor to three new grad students: **Erin erguist** will investigate the effects of Coal bed Methane development in the Powder River basin, W. **Trac Daern** will work with the NPS to improve maps and predictive models of Tamarisk invasion. **Jim Graham** comes from Hewlett-Packard and specializes in computational ecology.

**VSTORS**

Several experts from Kaakhstan working on USAID funded projects, and hosted by **Dennis Ojima** and **Kath Galin**, NREL Research Scientist and Dept. Chair of the Dept. of Anthropology, visited NREL at the end of February. The visitors included: Sayat Temirbekov (plant ecologist), Nurlan Malmakov (animal breeder), Aidos Smailov (economist), and Carol Kerven (anthropologist). An informal discussion was held covering Kaakhstan's social cultural aspects of pastoral systems, changes in vegetation cover, livestock systems, sheep breeding, and rangeland economics.

**PEOPLE****NE**

**Diana's** group has hired two new Postdoctoral Research Scientists: 1) **Emma Ross** will be working on the Antarctic and soil biodiversity projects. Emma received her Ph.D. at the Univ. of Western Sydney, Australia with a soil, microbial and nematode ecology focus. She recently spent three months in Switzerland where she studied nematode community structure and abundance under organic, bio-dynamic, and conventional farming treatments at the DOC long-term field trial for the Research Institute of Organic Agriculture and 2) **Johnson Nem**, received his PhD in Soil Ecology from the Univ. of New England, Armidale, New South Wales, Australia.

**Rod Chimner**, a new Postdoctoral Research Associate, is working with **Jeff Eler** on the NIGEC mixedgrass prairie manipulation study in SE Wyoming. Rod has been working on carbon cycling in peatlands and received his PhD from CSU in 2000.

**Ruce Lubow** is a new Research Associate working on projects with **Tom Hobbs** and **Francis Singer**. He will be modeling dynamics of populations of deer infected with Chronic Wasting Disease and will be developing methods for censusing wild horses. His experience includes population and optimization modeling, as well as statistical design and analysis of field studies. Ruce has masters and bachelors degrees from the Massachusetts Institute of Technology in Aeronautical and Astronautical Engineering. He received his PhD from Fishery and Wildlife Biology at CSU and he has been involved with several funded projects as a postdoctoral fellow at CSU for the past 3 years.

**Jasharee Ratnam** has joined the NREL as a Postdoctoral Research Scientist with an interest in the interaction of large herbivore grazing patterns, tree-grass dynamics, and ecosystem function. She earned her PhD in animal foraging strategies from the Univ. of Syracuse.

**Robin Reid**, a newly affiliated NREL Research Scientist, is a Systems Ecologist and Programme Coordinator for the People, Livestock and the Environment Programme at the International Livestock Research Institute in Nairobi, Kenya.

**Joe VonFischer**, Research Scientist, is a graduate of Augustana College, Sioux Falls, SD (A in Biology), PhD in Ecology and Evolutionary Biology from Cornell Univ., and a NOAA Climate and Global Change Postdoctoral Fellowship at Princeton. His interests include climate-biology interactions, and the ecology and biogeochemistry of soil microbial communities as related to greenhouse gas production.

**Genea Chong**, is now a NREL Research Scientist working with **Tom Stohlgren**. She is continuing to investigate the effects of pre-fire fuel reduction treatments and burn severity on post-fire processes and conditions.

**Erik Hard**, is a new Research Associate working on a project with **Tom Hobbs**, **Garocner**, Roy Roath, and the CDOW Habitat Partnership Program to address issues of cross-boundary management and sustainable habitat use by both domestic and wild ungulates in Jackson County, CO. Erik received his BS in Geology with a Biology minor from James Madison Univ. in Harrisonburg, VA and recently received his MS from CSU.

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