Natural Resource Ecology Laboratory
NREL News Notes
Colorado State University

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NREL IN THE LIMELIGHT

NREL Receives Designation as a Program of Research and Scholarly Excellence

Every four years, CSU designates 14 Programs of Research and Scholarly Excellence (PRSE). NREL submitted a proposal to this program which was evaluated by the Faculty Council Committee on Research, Scholarship and Graduate Education, the Council of Deans, the University Distinguished Professors, the Provost and the Vice President for Research and Information Technology (VPRIT). We are pleased to announce that NREL has, for a second time, received this prestigious designation. In a memo from the Office of the VPRIT, Tony Frank stated "Designation as a Program of Research and Scholarly Excellence recognizes the very high quality of work being done by these programs and the impact of their work throughout the state, nation and world. These outstanding programs are areas where Colorado State has earned world-renowned distinction. Your commitment to this program and the excellence of the faculty associated with the program are truly a credit to the institution and we congratulate you and your colleagues on your success." Thank you all at NREL who have worked so hard to earn this award.

SPECIAL EVENTS

NREL Celebrates the New Francis Clark Conference Room

On February 26, members of the CSU community and family and friends of Dr. Francis Clark attended a ceremony which marked the official re-naming of NREL's B215 Conference Room as the Francis Clark Conference Room. This honor was bestowed to Dr. Clark for his many contributions to ecosystem science, CSU, NREL, the College of Natural Resources, Larimer County, and the City of Fort Collins.

The 93 year old Dr. Clark is a world renowned microbial ecologist and recipient of the Agricultural Research Service's Hall of Fame Award and the Soil Science Society's Distinguished Career Award. He has authored several books and over 175 journal articles, and has collaborated over the years with many NREL and CSU scientists. Among many important contributions to

CSU, Dr. Clark and his late wife Evelyn established the Francis Clark Soil Biology Scholarship fund at NREL, an endowment which has supported 13 graduate students in environmental science since its inception in 199 . NREL is proud to honor Dr. Clark in this way.

Pictured L-R Joyce Berry, Diana Wall, Francis Clark

Tom Hobbs selected as a Leopold Leadership Fellow for 2004!

Tom is one of 20 outstanding academic environmental scientists from throughout the U.S. who have been selected as Aldo Leopold Leadership Fellows for 2004. He joins previous NREL members Dennis Ojima, athy Galvin, and Diana Wall in this honor. Diana now serves as co-chair with Jane Lubchenco for the Leopold Fellows Program. Aldo Leopold Leadership Fellowships provide scientists with intensive communications and leadership training to help them communicate scientific information effectively to non-scientific audiences, especially policy makers, the media, business leaders and the public. They are selected through a competitive application process. They have outstanding scientific qualifications and have demonstrated leadership ability and a strong interest in communicating science beyond traditional academic audiences.

RESEARCH PR ECT NE S

New Grants

NASA and NOAA Award 3.7 Million for Environmental Research to NREL
Two Federal agencies, the National Aeronautic and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA), have announced plans to support three separate global change research projects at NREL. Two projects funded by NASA ("Carbon Data Assimilation Modeling Remote Sensing and Field Observational Constraints of Earth System Carbon Analysis," Dennis Ojima, PI, 1.45 million over 3 years detailed more on page 2 "Airborne Carbon" and "The Role of Africa in Terrestrial Carbon Exchange and Atmospheric CO2 Reducing Regional and Global Carbon Cycle Uncertainty," Niall Hanan, PI, 1.05 million over 3 years) will investigate carbon cycle dynamics and variability in North America and Africa, to determine how terrestrial vegetation ameliorates, or contributes to, increasing atmospheric CO2 concentrations. A third project (Biological Fingerprinting of Biodiversity in the Western United States, Tom Stohlgren, PI, 1.2 million over 3 years) will focus on the relationships between biodiversity hotspots in North America and invasive non-native species. The two North American research projects were funded by NASA's Earth Science Enterprise to use NASA satellites, together with other forms of geospatial data and simulation models, to address two of the most pressing global change issues for the United States 1) How do U.S. ecosystems contribute to the uptake of CO2 from the atmosphere, sometimes called the "missing sink " and 2) how can we predict where and when invasive plants, animals and diseases will occur relative to hotspots of diversity of native plants and animals Niall Hanan's project, which is jointly funded by NASA and NOAA, will also investigate the carbon cycle, but with a particular focus on Africa, to examine how climate variability, drought and human management contribute to carbon uptake and release by the continent, and thus the role of Africa in global atmospheric CO2 concentrations.

The Airborne Carbon in the Mountains Experiment Project: NREL, CU, and NCAR scientists are participating in the first airborne study of carbon fluxes in the Rocky Mountains. They will measure fluxes over the state of Colorado using the NCAR C-130 research aircraft during April, May, and July. NREL scientists, together with CIRA scientists, developed the models of atmosphere and biosphere that are being used in planning and analyzing the airborne data. The project is supported by NSF Biocomplexity (Dave Schimel, NREL NCAR Dennis Ojima, NREL, and Russ Monson, CU - Co-PIs "Carbon Sequestration in Complex Landscapes") and by NASA IDS (Dennis Ojima and David Schimel, PIs "Carbon Data Assimilation Modeling Remote Sensing and Field Observational Constraints of Earth System Carbon Analysis").

Stephen Ogle (NREL) was awarded 99,907 from the U.S. Environmental Protection Agency for a one-year project entitled "Agricultural Land Use and Management Impacts on Agricultural Soil Organic C National Inventory Reporting and IPCC Inventory Guidelines."

Jill Baron (NREL USGS), with three USGS colleagues, and Rich Conant (NREL) were funded by USGS Science Impact funds to conduct a two-year project entitled "Taking America's Pulse Development and Application of Human and Environmental Indicators using an Analytical Problem-solving Tool."

athy Galvin (NREL Anthropology) and Dennis Ojima recently received funding for a developmental proposal from NSF for one year to write a full proposal to study "Household Decision Making Under Uncertainty." Other participants include Michele Betsill (Dept. of Political Science, CSU), Randall Boone (NREL), Robert Harriss, Emilio Moran, Compton Tucker, .S. Rajan, Tom Veldkamp, and Jill Lackett (NREL).

Ongoing Research News

Geneva Chong (NREL USGS) is presently working on three U.S. Geological Survey Central Region Integrated Science Program (CRISP) research projects "Management of Mancos Shale Lands in Colorado" and "Effects of Coalbed Methane Development in the Powder River Basin, WY" with Paul Evangelista (NREL) and Bureau of Land Management cooperators and a project with the Rosebud Sioux, SD, looking at the distribution of ceremonial plants on their lands. In addition to providing science for resource management, the CRISP is designed to foster interdisciplinary research.

Global Land Project Update The Global Land Project is jointly sponsored by the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimension Programme (IHDP) and was recently reviewed at meetings in Moscow and Bonn, respectively. As a result, the science plan is being revised and should be finalized this summer. The scientific steering committee will be selected during the next few months with the approval of IGBP and IHDP. The proposed International Project Office is still being developed.

New From UVB

The UV-B Monitoring and Research Program has recently launched a climatologic site in Seguin, Texas and a research site in Lamar, Colorado.

The Seguin site, overseen by renowned scientific expert Forrest Mims,

provides a great transect between two of UVB's southern sites (at Big Bend, Texas and Baton Rouge, LA) and helps monitor ultraviolet changes due to the equatorial air mass that comes up from the tropics.

UVB is also working with John Harton, Director for the High Energy Physics Group at CSU, to set up the Lamar Community College site for monitoring air quality. The site consists of a Vis-Multi Filter Rotating Shadowband Radiometer and a UV-Multi Filter Rotating Shadowband Radiometer to provide continuous aerosol optical depth (AOD) data to the CSU Physics Department project competing for the Ultra-High Energy Cosmic Rays project of the international Pierre Auger Observatory. Our AOD data will be used to verify the cleanliness of the air in the region, as the absence of aerosols and other contaminants is crucial to the successful detection of these Ultra-High Energy Cosmic Rays. If the atmosphere is clean enough, this southeastern Colorado area could become the northern hemisphere component of the Pierre Auger Cosmic Ray Observatory, with the southern hemisphere component currently under construction in the Pampa Amarilla region of Argentina. If the Lamar site is chosen as the northern hemisphere component of the Auger Observatory, the region would benefit economically and would become an epicenter for a world class research science project.

APP INTMENTS

eith Paustian (NREL) was selected as a lead convening author (LCA) for the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. He will be one of the three LCAs for "Volume 4 Agriculture, Forestry, and Other Land Uses." In addition, Stephen Ogle and John Brenner (USDA-NRCS and NREL) were selected as lead authors from the U.S. for Volume 4 of the 2006 IPCC Guidelines for the National Greenhouse Gas Inventories.

NREL Research Associate Gary Wockner has been chosen as one of four Colorado conservationists to serve on the Colorado Gray Wolf Management Plan Working Group assembled by the Colorado Division of Wildlife. The purpose of this group is to develop a Wolf Management Plan necessitated by the expectation that wolves will enter Colorado in the near future. Wolves have been reintroduced to Wyoming and New Mexico and have also been spotted in Utah. In 1996, Wockner wrote his PhD thesis on wolf management at Isle Royale National Park. Since then he has worked on various research projects with many agency staffers and ranchers who will also be a part of this working group. Wockner is an advocate for reintroducing wolves into Colorado.

Tom Hobbs served on the David Smith Fellowship panel for the Nature Conservancy in March.

Jill Baron was guest editor for a Forum in Ecological Applications 14 (2004) on Research in National Parks.

TREACH AN SPECIAL MEETINGS

In January, Mike Coughenour and Dave Swift (NREL) were invited to participate in a workshop in Iran entitled "Conservation of the Asiatic Cheetah" organized by Taghi Farvar and Jamie Everett of the Iranian Non-Governmental Organization, Center for Sustainable Development (CENESTA). The cheetah, which once ranged across the Middle East from Saudi Arabia to India, now remains only in Iran where its population is estimated to be about 50 individuals. Mike and Dave were invited because of their experience in systems in which conflicts between pastoralists and

wildlife threaten the livelihood of one or both, as is the case in Iran with the cheetah. Mike presented a primer on the SAVANNA modeling system and Dave discussed non-equilibrium dynamics in arid rangelands. CENESTA is interested in continuing a relationship with NREL through a collaborative research project on the ecology of pastoral systems in Iran.

Dennis Ojima, NREL scientist and New Research on Population and Environment panel member, attended a National Research Council (NRC) sponsored workshop in January on "Research on Population, Land Use, and Environment" in Irvine, California. The purpose of the workshop was to evaluate progress on population, land use, and environmental research linkages and to recommend steps for further scientific development. Numerous presentations were given, including those from NREL colleagues Pam Matson, Myron Gutmann, and Emilio Moran. Dennis is also co-author of the NRC workshop report.

Following this meeting, Dennis traveled to Tashkent, Uzbekistan to attend the International Workshop on "Global Change, Sustainable Development and Environmental Management in Central Asia," sponsored by the Asia-Pacific Network for Global Change Research (APN), Global change SysTem for Analysis, Research, and Training (START), MEDIAS-France, UNDP Government of Uzbekistan Environment Programme (Atrof Muhit), and the State Committee for Nature Protection of the Republic of Uzbekistan. Dennis gave two presentations, one for the START Secretariat and a second entitled "Land Use and Climate Change Interactions of Eurasian Ecosystems." He also chaired the session on land use, regional ecosystems, and biodiversity. The purpose of the workshop was to investigate potential research studies to enhance ecosystem management and sustainable ecosystem dynamics.

Dennis also attended the "Rangelands of Central Asia Transformations, Issues and Future Challenges" Symposium at the Society of Rangeland Management in Salt Lake City in January. He presented "Socio-economic and global change impacts on rangeland productivity of the Eurasian Steppes of the Mongolian Plateau and azakhstan." Also present were co-authors Togtohyn Chuluun (Mongolia), Sayat Temirbekov (azakhstan), Carol erven (U), and Boldyn Bolortsetseg (Mongolia), as well as Julia lein (NREL) and former NREL alums Lindsey Christensen, u Lan, and Y. . hang.

In April, Dennis Ojima participated in the "Learning from the National Assessment Workshop" in Washington, DC. The purpose of the workshop was to distill lessons to be used in designing the next assessment from the recently completed (NAST 2001) National Climate Change Assessment.

In February, Mike Coughenour (NREL) traveled to Serengeti National Park, Tanzania, and Maasai Mara National Reserve, enya, to participate in a workshop for the development of a proposal for continued collaboration between these two protected areas and Yellowstone National Park. Robin Reid (ILRI NREL) participated in the Mara meeting. The project will be funded by the USAID Global Livestock CRSP, with Lisa Graumlich of Big Sky Institute, Montana State University as PI. The accommodation consisted of a tented camp, erected by err and Downy specifically for the workshop. The tents were spacious, with queen sized beds, showers, and even flushing toilets Of course, the wildlife was spectacular

In April, Mike Coughenour traveled to Ouarzazate, Morocco, to participate and present a paper at the conference in which the results of the IMPETUS project were presented. IMPETUS is an EU funded project to German

principal investigators, in which they are studying the impacts of hydrological alterations (damming) in the Draa River Watershed in southern Morocco. This involves indirect impacts on land use and grazing by pastoralists in the region. There is interest in using Mike s SAVANNA model to help conduct the necessary integrated assessments of such impacts.

Mike also traveled to Almaty, azakstan, in May to present a paper and participate at the "Desertification and Recovery in Central Asia Conference." Mike has conducted research on this project (DARCA, funded by the European Union to Roy Behnke of McCaughley Land Use Research Institute in Aberdeen, Scotland), involving the use of remote sensing data (NDVI) to assess vegetation biomass changes in the pastoral areas of azakstan and Turkmenistan that might have been in response to the political reforms that have occurred since the breakup of the Soviet Union. This research was originally planned to be carried out by the late Jim Ellis, NREL. Due to the long history of collaboration between Jim and Mike on this kind of research, mainly in East Africa, Mike was selected to complete the work. The study site is located on the south side of the Atlas Mountains, and spans a large area that extends to the northern edge of the Sahara Desert.

Jill Baron took part in a program at Colorado College in May to unveil the 2004 Rockies Report Card. Other speakers included Ed and Betsy Marston, Charles Wilkinsen, Tom Sisk, and Former Governor Richard Lamm.

Randy Boone (NREL) attended a workshop sponsored by the Global Livestock CRSP and the British Embassy in azakhstan in April, to help local goat farmers produce higher quality cashmere. He also gave a detailed presentation to the Botanical and Phytointroduction Institute in Almaty, azakhstan on Gap Analysis, the U.S. program that promotes biodiversity conservation by keeping common species common.

Tom Hobbs gave the following featured presentations "The New Statistics in Ecology Examples from the Study of Chronic Wasting Disease in Mule Deer Populations" at the National Science Foundation in January a seminar entitled "Dynamics of Chronic Wasting Disease in Colorado Mule Deer Populations" at the School of Fishery and Aquatic Science of the University of Washington in January and "The Devolution of Adaptive Management" at the Adaptive Management of Fish and Wildlife Populations workshop in Umea, Sweden in April.

Diana Wall participated in a review of the Duke University Department of Biology in March. In April, she was an invited speaker at the International Symposium on "Impacts of Soil Biodiversity on Biogeochemical Processes in Ecosystems International Workshop on Molecular Methods in Soil Biological and Biochemical Diversity in Terrestrial Ecosystems," Taipei, Taiwan. Diana also participated in the Millennium Ecosystem Assessment, as a Coordinating Lead Author for the "Implications for Achieving the Millennium Development Goals" chapter in Montreal, Canada and she attended the Council of Scientific Society Presidents meeting in Washington, DC as past chair.

Greg Newman (NREL) presented a status report to the Semantic Prototypes In Research EcoInformatics (SPIRE) Workshop in Berkley, California to update the group on the status of the invasive species forecasting service. SPIRE is an NSF funded project to develop semantic web technologies designed to facilitate the data mining capabilities of the web for ecological data purposes. This project is a cooperative project

with our NASA grant for the invasive species forecasting service.

GRA ST ENT NE S

In April, DeAna Nasseth was invited to present "What Ecologists Do Definitions and Careers" to 200 students at Eagleview Middle School in Colorado Springs. She solicited and received "ecology in action" photographs from ecologists worldwide to integrate as part of the presentation. The students were very attentive, and hopefully, inspired to consider a career in ecology.

Catherine Crosier (Tom Stohlgren, advisor) successfully defended on March , "Data synergies and invasive plant species distributions in Colorado." She graduated spring semester and is now working at the USGS.

VISIT RS

Amory Lovins, Chief Executive Officer, Rocky Mountain Institute (http www.rmi.org) met with NREL scientists in April. He conducted an open discussion covering such topics as global climate change, shifts in agricultural practices due to food safety issues, and RMI environmental policy recommendations made to US government agencies. Mr. Lovins is an experimental physicist educated at Harvard and Oxford. His work focuses on transforming the automobile, real estate, electricity, water, semiconductor, and several other manufacturing sectors toward advanced resource productivity. He has briefed sixteen heads of state, held several visiting academic chairs, authored or co-authored twenty-eight books and hundreds of papers, and consulted for scores of industries and governments worldwide.

In May, Tom Stohlgren and his group hosted partners from NASA and other institutions for an Invasive Species Forecasting System (ISFS) Science Team Meeting. Two days of presentations and break-out groups were hosted at the US Geological Survey Fort Collins Science Center, and the first version of the web-based ISFS was released to the group for testing. Informal meetings at the NREL included a session for the identification of tamarisk study sites in Colorado and Utah where hyperspectral satellite data will be collected in conjunction with ground-based work.

Dr. Richard Bardgett, University of Lancaster and Dr. Jim Garey, University of South Florida, Co-PIs of Diana Wall's new NSF project, Global Patterns of Soil Biodiversity Implications for Ecosystem Function, visited NREL in February.

Visiting scholars from Central Asia came to NREL for ecosystem analysis of carbon dynamics and land use change. Sayat Temirbekov from the Laboratory of Geobotany of the Institute of Botany and Phytointroduction, azakhstan Ministry of Education and Science, visited in March to continue spatial analysis of ecosystem dynamics in the abandoned cropland areas of northern azakhstan. He worked with Dennis Ojima, Randy Boone, Mike Coughenour, and athy Galvin during his four week stay. Muhtor Nasyrov from the Plant Physiology and Microbiology Department, Samarkand State University, Uzbekistan is visiting NREL to work with Dennis on modeling analysis of tower flux data from the Samarkand research site.

PE PLE

Julia lein has come to NREL as a NOAA Climate and Global Change Postdoctoral Research Fellow. She is working with Dennis Ojima to couple

modeling and remote sensing with her detailed field studies to further understand interactions among climate variability, pastoral land use change and ecosystem dynamics on the Tibetan Plateau. Julia received her BA from Cornell University and her MS and PhD from the University of California at Berkeley. She investigated the effects of climate warming and pastoral land use change on carbon cycling, biodiversity and rangeland quality on the northeastern Tibetan Plateau for her dissertation research.

Augustus (Gus) Conant, son of NREL research scientist Rich and his wife Beth, arrived on 3 1 .

GI□TS T NREL

NREL is deeply grateful to the many individuals who have made initial contributions to our new Excellence in Enhancing Global Connections endowment. This ambitious endowment will be used to support bridge salary for scientists and other costs and opportunities which cannot be accommodated by NREL's base of federal grant funding. It is expected to be a very important part of NREL's future operations. Every dollar donated to this endowment by individual NREL supporters is being matched by an anonymous donor, making this a one-of-a-kind opportunity to enhance NREL's future. Over 60,000 has been raised so far. If you are interested in contributing to this exciting new endowment, please contact Neil Shropshire (970-491-5645 or neil□nrel.colostate.edu) for more information.

NREL is also grateful for the continuing support given by donors to the James Ellis Scholarship Fund, which will support students interested in human dimensions of global environmental change, and to the general NREL gift fund, which supports a variety of efforts beneficial to NREL.

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