NREL NEWS NOTES

NATURAL RESOURCE ECOLOGY LABORATORY
Colorado State University

No.23 July, August and September 1997

Spotlight on Science

Featuring: Keith Paustian, Sr. Research Scientist-Natural Resources Ecology Laboratory

In this anniversary year, I'm prompted to think back on the many, and often subtle, ways in which NREL has influenced my scientific career. It began with my MSc work at CSU, on the FIRELAMP modeling project, led by Freeman Smith, with Bill Parton and Jon Gustafson as consultants, and shepherded by Mike Vevea (later to become a "legendary" systems manager at NREL). Looking for interim work after graduation, I landed a temporary programmer job, working for Tom Kirchner, Jerry Dodd, Bill Lauenroth and John Heasley on the EPRI/SO2 project - plus lively exchanges with other NRELer's across the noontime volleyball net! I leftNREL for an eight year stay in Uppsala, Sweden, to work on a large agroecosystem study, the Ecology of Arable Land - Organisms, Carbon and Nitrogen Cycling. At the time, we were one of three or four major agroecosystem projects in the world, another of which was the Great Plains project, initiated by Vern Cole and involving many other NREL scientists, including Ted Elliott, Dave Schimel, Bill Parton, Bill Hunt, and Indy Burke - to name a few. A natural collaboration developed between the groups at Uppsala and NREL, resulting in some memorable workshops and joint meetings. For my part, the collaboration continued while doing a post-doc at Michigan State and it was largely through the development (with Ted Elliott and Vern Cole) of a joint CSU/MSU proposal to EPA that I was able to make my way back "home" to NREL.

I feel fortunate in working with great people on a very diverse - yet unified - set of tasks, ranging from basic to applied questions, at micro to macro scales! With funding from NSF and USDA, Ted Elliott, Serita Frey, Johan Six and myself are investigating the role of soil structure and microbial communities - and how they interact with environmental factors and human management (e.g., tillage) - in

controlling SOM formation and turnover. We've been extremely fortunate in having some excellent European collaborators, Georg Guggenberger, Roel Merckx and Katrin Kimpe, with dedicated technical help from Clay Combrink and Tara Rutledge. Modeling, field and laboratory work are all integral to this effort.

Another activity has been the development of a network of long-term agricultural field experiments, begun with EPA sponsorship and later additional support from USDA and DOE. The network has been the basis for a unique collation of long-term ecological data, documented in a recent book, "Soil Organic Matter Dynamics in Agroecosystems: Longterm Experiments in North America." This collaboration, involving many scientists across North America, has also been the basis for an ongoing set of regional syntheses, using both existing and newly acquired data on SOM C and N. Moreover, the data provide a unique resource for the development and testing of agroecosystem models.

Increasingly, NREL scientists are being asked to provide answers to policy and management related questions - at regional, national and global scales. I, together with Vern Cole and Ted Elliott, have been involved in several activities related to agriculture and global change, including assessments of future impacts on agricultural systems and assessments of mitigation potentials, as part of the IPCC process.

Regional analyses using simulation modeling and geographic databases - an approach pioneered by NREL scientists over the past 10 years - are a major part of our work. Kendrick Killian and Jan Cipra play key roles in programming and GIS support for such studies. Current studies include quantifying effects of agricultural management practices on soil C seque stration and analying management - climate change interactions in Great Plains agriculture. We are also providing information and analysis results to stakeholders such as the Farm Bureau and the Natural Resource Conservation Service, who are involved in the debate about agriculture and climate change policies. Improving our basic understanding of soils and ecosystem behavior, as embodied in quantitative models, and wisely applying that knowledge to aid decision makers, is a major challenge. I can think of no place that fosters those efforts better than NREL.

NREL Reunion Sy□posiu□

October 21, 1997

(with the Association of Ecosystem Research Centers)

To see who is attending, check the guest list on the www at:
http://www.nrel.colostate.edu/30th_guest.html

□**ttention:** If you have not filled out a registration form - □**O SO NOW**

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Be sure and see the comments and pictures on the Remember NREL page /30thtrivia.html

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Brian Newkirk left NREL at the end of July for a challenging new career with Colorado Springs Utilities, Information Systems Department, Colorado Springs, CO.

Gary Lear resigned from NREL August 15 as Research Associate and Acting Coordinator, NADP to accept a position with U.S. EPA, Washington, D.C.

Jack Hautelouma will be on a Fulbright Fellowship to the University of Rijeka in Croatia during the spring semester, 199. Prior to and following that time, Jack will be the Management Training person on an Asian Development Bank Thailand Skills Development Project.

Tom Stohlgren was interviewed by Science Magaine regarding his work on the invasion of exotic plant species into several landscapes in the Central Grasslands and Rockies. The study by Tom, Dan Binkley, Geneva Chong, Mohammed Kalkhan, Lisa Schell, Kelly Bull, uka Otsuki, Greg Newman, Michael Bashkin, and owhan Son, to be published in Ecology, suggests that biological diversity is not always a shield against invasions. In fact, several of the highly diverse areas studied were found to be magnets for invading weeds. The expectation that species-rich ecosystems should be resistant to invasions stems from a notion that diversity goes hand-in-hand with ecological productivity and stability.

On or about September 30, NREL will take delivery of one of the largest and fastest computers on campus, an HP Exemplar mini-supercomputer. This computer will support large satellite data analyses after the launch next year of the EOS AM-1 spacecraft, and global modeling studies. The machine is designed for parallel programming applications and represents the cutting edge technology. Becky McKeown is in charge of the computer and deserves substantial credit for negotiating an extraordinary deal with Hewlett-Packard to enable NREL to acquire this showcase equipment.

Tom Stohlgren, Dan Binkley and Linda Joyce (USFS) will co-teach an ecology class on "The Mountains and Plains of Colorado" at CSU (E592) -- Fall semester, plus a few field trips.

A retirement reception was held for Linda Bandhauer on Friday, Sep. 19, at the Lory Student Center, University Club. Linda worked for NREL and the NADP/UVB programs for 17 years and will be greatly missed! Happy retirement, Linda - ENJO!!

On August 2, Jill Baron briefed Dr. Bill Brown, science advisor to Bruce Babbitt, Secretary of the Interior, on the effects of global change on national parks.

Jill Baron led a special field trip of Loch Vale watershed on Aug. 29, for Stephanie Foot (member of the Colorado Air uality Commission and assistant to Denver Mayor Wellington Webb), Craig Axtell and Jeff Connor (Resource Management and Research Division of Rocky Mountain National Park), and Rey Stendell (Director, USGS Midcontinent Ecological Science Center). The topic of discussion was the connection between Front Range urban and agricultural emissions of nitrogen and elevated nitrogen deposition in Rocky Mountain National Park.

Meetings

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Jill Baron presented a paper titled, "The Influence of Land Cover and Temperature Change on Hydrological and Ecosystem Dynamics in the South Platte River Basin," to the American Water Resources Association meeting on Water Resources Education, Training, and Practice: Opportunities for the Next Century at Keystone, CO on July 1. Co-authors of the accompanying paper published in the proceedings are D.S. Ojima, M.D. Hartman, T.G.F. Kittel, R.B. Lammers, L.E. Band and R.A. Pielke.

Jill Baron participated in the Rocky Mountain Regional Forum, a meeting sponsored by the Department of Energy, EPA, Colorado Department of Public Health and the Environment. The meeting was held at NCAR-Boulder, July 9, and is the beginning of a large, state-wide effort for mitigation.

Bill Davis attended the 2nd Annual Conference on Teaching with Technology, hosted by the University of Colorado, Boulder. This year's theme was "From Foundations to Best Practices." Some URL's of note are: www.allencomm.com -- (Tutorial Software on Instructional Design/Development) homebrew1.cs.ubc.ca/webct -- (WWW Course Development Tools) www.mcrel.org -- (Mid-continent Regional Educational Laboratory Tools) mentor.external.hp.com -- (HP Telementoring Program for K-12).

Dennis Ojima participated in Session II of the Eighth Annual Aspen Global Change Institute Summer Science Sessions, held in Aspen, CO, Jul. 30-Aug. 7. Session II was centered around the theme "Global Environmental Change: Planning for an Effective U.S. Assessment." While attending the last part of this meeting, Dennis also attended the first week of the "Climate Change Impacts and Integrated Assessment Workshop," held in Snowmass, CO.

Tom Stohlgren attended and delivered a talk at the BLM, National Science Council Meeting at CSU on Aug. 2.

Deb Coffin attended a workshop, July 27-30, entitled "Campus Ecology: Campus Based Applications for Long Term Ecology Research Sites." The workshop was organied by Drs. Gerry Saunders, John Moore and Jennifer Clark. It was sponsored by an NSF grant to the University of Northern Colorado. The objective of the workshop was to write a book on how to apply the concept of long-term experimental ecology to improve high school and undergraduate biology education. The workshop was attendd by high school teachers, science educators and university researchers.

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Diana Wall attended and presented a talk, titled "Nematode Biodiversity and Soil Habitat Suitability in Hot and Cold Deserts," at the Society of Nematologist's annual meeting in Tucson, A, July 1 -23. She also co-chaired the Soil Ecology paper session. Bob Niles also attended the meeting and presented a poster titled "Soil Moisture Gradient and Nematode Distribution within Alfalfa Plants and Fields in Colorado."

Keith Paustian was one of three invited members of an expert panel on "Conservation Tillage and the Environment: Impacts on Global Climate, Water and Soil ualtiy and Wildlife," at the Monsanto Conservation Tillage Global Forum in Nashville, TN, July 21.

The NSF Workshop on Survey and Inventory of Soil Nematodes held in Tucson, A, July 23 -25, was chaired by Diana Freckman, PI.

Jill Baron was a participant of the Aspen Global Change Institute on Global Environmental Change: Planning for an Effective U.S. Assessment, Jul. 29-Aug. 3. Baron, along with Fred Wagner, Utah State University, will be hosting a regional climate change assessment meeting in Feb. 199 for the Rocky Mountain/Great Basin.

Diana wall attended the National Research Council Board on Environmental Studies and Toxicology meeting at the J. Erick Jonsson Woods Hole Study Center in Woods Hole, MA, Jul. 31-Aug. 3.

Jill Baron was an invited discussant in New London, NH, for the Gordon Conference:

Hydrobiogeochemistry of Forested Catchments, Aug. 3-.

Mike Coughenour was an invited speaker at the "Greater ellowstone Area Science Workshop" on Aug. 19-21.

Bill Parton, Dave Schimel, Becky McKeown, and Robin Kelly attended a meeting of VEMAP and CMEAL scientists at Lake Flathead in Powlson, MT, August 22-25.

Francis Singer, in concert with several other NREL scientists, has wrapped up an -year effort to research the effects of ungulates on ellowstone's northern range. Two milestone reports "Effects of Graing by Wild Ungulates in ellowstone National Park" (edited by Singer) and "ellowstones northern range-complexity and change in a wildland ecosystem" (Singer is coauthor) are available free of charge by writing the Center for Resources, Box 1, ellowstone National Park, W 2190.

Most of the field work was conducted between 19 and 1991 when Singer was stationed in the park and guided the large interdisciplinary effort. Singer came to NREL in 1992 to complete the last of the field work, data analysis and write-up of this major research effort, with a significant portion of the work done as part of a PhD degree. Singer authored or coauthored 2 refereed publications and 1 government reports, mostly while working at NREL, on this topic. Other key NREL players were Jim Detling, who was part of the original assessment team in 19 and a coauthor on two of the papers, Dave Swift, who supervised much of the dissertation work, and Mike Coughenour, who conducted much of the modeling and data synthesis for the project. Kay McElwain and Michele Nelson put hundreds of hours of time of excellence into the final manuscript prepartions.

A second major research effort on ungulate ecology conducted through NREL is also reaching fruition stages. In 1992, the National Park Service, the National Biological Service (now Biological Resources Division of USGS) and NREL entered into a -year research effort into the conservation biology and restoration of declining and fragmented populations of Rocky Mountain and desert bighorn sheep in 15 national parks. F. Singer was coordinator of the overall project, Dave Swift supervised the test of a GIS-based habitat model to assess large landscape areas for suitable unoccupied restoration sites (performed as a M.S. project by T. Johnson), and John Gross has developed an individually-based population model to explore optimum removal (for purposes of translocation stock) and optimum spatial (i.e., metapopulation) features of populations.

F. Singer chaired a special session at the Annual Meeting of the Desert Bighorn Sheep Council, 10 April 1997, entitled "Restoration of bighorn sheep in and near national parks." NREL scientitst made the following presentations, "Do bighorn sheep ever disperse?" (F. Singer and M. Moses), "Simulating dynamics of bighorn sheep metapopulations to support management decisions" (J. Gross, M. Moses and F. Singer), and "Genetic diversity and effective population sie in bighorn sheep: no simple correlation" (R. Ramey and F. Singer).

John Gross, Francis Singer, and Mike Moses also made two presentations on the bighorn sheep research at the ESA meetings in Albequerque, New Mexico in August of 1997 "Evaluating options to enhance the persistence of spatially structured bighorn sheep populations" and "Dispersal and coloniation rates in bighorn sheep the role of disease, patch sie and corridors." Francis Singer and John Gross, with extensive assistance of Kay McElwain, are nearing completion of a capstone document, on the work entitled "Restoration of Bighorn Sheep into 15 National Park Units in the Intermountain region" (under review).

NREL was very well represented at the 1997 Ecological Society of America meeting in Albuquerque, NM, Aug. 10-1. Those attending were: Dennis Ojima, Bill Parton, Ted Elliott, Diana Freckman, Keith Paustian, Menwyelet Atsedu, Deb Coffin, Serita Frey, John Gross, Melannie Hartman,Jim Ellis, Robin Kelly, Tamera Minnick, Andy Parsons, Amy Treonis, Johan Six, Tom Stohlgren, Geneva Chong, Jill Baron, Ana Child, Tamara Hochstresser, Gyury Kroel-Dulay, Tim

Kittel and Beth Holland.

Kathy Galvin, Mike Coughenour and Jim Ellis organied a workshop titled, "Developing a Decision Support System (DSS) for Integrated Assessment of Pastoral-Wildlife Interactions in East Africa," held at the International Livestock Research Institute, Nairobi, Kenya, May 21-2.

Other CSU participants were Ann Magennis, Anthropol. Dennis Child and Larry Rittenhouse, Rangeland Ecosystem Sci. and participants from Kenya, Tanania, Uganda and Ethiopia helped set regional priorities for the DSS. Funding was provided by the USAID Small Ruminant, Collab. Res. Support Group.

Kathy Galvin presented a paper titled "Agriculture in the U.S. Great Plains: Effects of Environment, Government and Agricultural Programs on Land Use" at the 1997 Open Meeting of the Human Dimensions of Global Environmental Change Research Community. The meeting was held at IIASA, Laxenburg, Austria, June 12-1.

Bill Parton traveled to Brisbane, Australia, in early July to work with other scientists at CSIRO, Division of Tropical Pastures and Grasslands Development, on the use and testing of the trace gas Century model. He also worked with scientists on the application of the Century model for rangeland in Australia. Both Bill and Dennis Ojima attended the GCTE meeting on "Dynamic Grassland Vegetation Models," held July 1- in Canberra, Australia, and focused on ecosystem model development for the EOS project.

Mike Coughenour attended the workshop titled "Crisis Mitigation in East African Livestock Systems" in Nanyuki, Kenya, July -10.

On August 1 -21, Bill Parton was an invited participant in the Climate Change Working Group meeting in Bogor, Indonesia. The working group was held prior to the Alternatives to Slash-and-Burn th Annual Review Meeting.

Mike Coughenour was an invited speaker at the "Ecosystem-based Management Workshop," held on Aug. 25-2 at Elk Island National Park, Alberta Canada.

Diana Wall attended the DIVERSITAS Steering Committee Meeting in Montreal, Canada, Aug. 29 and on Aug. 30, 31, and Sep. 1, she presented talks on the theme of "Agricultural Systems: Soils and Sediments" to the workshop, "Developing Biodiversity Issues: Challenges for the Future" co-sponsored by DIVERSITAS and the Convention on Biodiversity Secretariat.

Dave Schimel attended the Fifth uadrennial CO2 Symposium in Cairns, Australia, September 5. Dave will serve as Guest Editor for the resulting special volume of Tellus.

Francis Singer, Chair, and Mike Coughenour, Co-chair are organiing a symposium for the th Annual Wildlife Society Meeting, to be held 23 Sep. 1997 at Snowmass, Colorado. The Symposium is entitled, "Ecology and Management of Ungulates in National Parks in Western North America." The session features talks on effects of ungulates on ecosystems and ecosystem process, ungulate population dynamics, and ungulate management problems and solutions. The session focuses on comparisons between U.S. and Canadian parks and on syntheses. A book is planned from the proceedings.

The NATO ASI on "Soils and Global Change: Carbon Cycle, Trace Gas Exchange and Hydrology, " held June 1 -27 at the Chateau de Bonas near Castera Verduan and directed by Beth Holland, was

astoundingly successful. The NREL contingent was strong and included Beth as Director, Vern Cole, Gene Kelly and David Schimel as Lecturers, and Eliabeth Sulman and Meg Walsh as students. There are many fine stories and a new song was written by lecturers Sue Trubore and Jen Harden: The Bulk Density Song (sung to the tune of "My Bonnie Lies Over the Ocean"):

My carbon lies in the soil profile,

It erodes and goes to the sea,

To say what the flux is remember to measure the bulk

density.

Chorus:

Measure, measure, measure the bulk density (repeat)

We met at the Chateau de Boas,

We drank wine and ate the good Brie,

By the end of two weeks we have increased,

In both mass and bulk density

Repeat the Chorus

There are pictures posted on the Web and a book titled "Notes from the Underground: Soil Processes and Global Change" will be ready for distribution within a year. The book title is courtesy of Adam Hirsch, Univ. of Calif.-Irvine, for which he won an appropriate prie, largely unavailable in the U.S. Other notable entries in the title contest included: "Global Change: Dig or Die" "BONAS: Biogeochemistry, Organic Matter, Nutrient Cycling, and Soils" "Circular Histories in a Spherical World: Cycles of Water, Carbon and Trace Gases in the Biosphere" "Fantasy, Fluxes and 2" "The School of Hard NOx" "Soil: Friend or Foe? Understanding Its Role in Global Change" "Ode to Bulk Density or How I Learned to Stop Worrying and Love the Dirt" "Soils and My Abdomen: Scaling from Wine Glass to Liver Failure" and "Return to the Planet of the Soil Pits."

Finally, Vern was crowned the "King of Phosphorus." Gene Kelly was awarded the Molicone prie upon the recommendation of his mother. (FI: Molicone is an Italian term which received a lot of attention at the ASI. It describes a male who is full of flattery for women, but is a little weak when it comes to the actual relationship). Gene was presented a pair of sunglasses to help in his role. Paolo Nannipieri, a long time friend of the NREL, and a lecturer at the ASI, was awarded a soccer ball for one of his passionate pursuits and his leadership in organiing games.

Lindsey Christensen, Jim Ellis and Mike Coughenour spent part of the summer in China, working on analyses of climate-landuse interactions on the Mongolian Steppe. Lindsey and Jim spent most of July traveling with a large group of Chinese scientists, under the leadership of Dr. hang inshi, Director of the Institute of Botany, Beijing. The group conducted an ecological survey of the North East China Transect (NECT), one of the Terrestrial Transects of the IGBP. The NECT runs east-west across nothern China, from the Russian-Korean-Chinese border on the coast of the Sea of Japan, to the town of Erenhot on the Mongolian border, a distance of about one thousand miles. The eastern end of the transect is mixed decidous forest (oak, elm, maple, etc.) not unlike the forests of the midwestern US. The NECT follows an east-west rainfall and landuse gradient, passing through intense cultivation (the Chinese corn-belt) in Jilin Province, through meadow steppe grasslands, much of which has been converted to agriculture, like our tall grass prairie through true steppe (mixed-grass prairie equivalent), desert steppe, and finally to Gobi Desert along the Mongolian border. Data was gathered all along the transect (at 25 km intervals) on vegetation, land use, livestock and human habitation, but our main interest is in the western portions of the transect where cultivation grades into livestock husbandry, and grassland merges with the desert. Here, modern Mongolian pastoralism is mixed with a touch of traditional landuse, as herders st ill inhabit the Ger (yurt) on summer livestock ranges.

Following the completion of the NECT survey, Lindsey and Jim set up research at the Inner Mongolian Grassland Ecosystem Research Station at ilingele in Inner Mongolia, with the assistance of Dr. Li Linghao and Professor Chen hou hong, Director of the IMGERS station. Lindsey conducted field assessments of plant species composition and biomass in relation to land use and livestock density. In late July and August, Mike Coughenour and NSF-MMIA project collaborators from the Kansas Applied Remote Sensing Center, University of Kansas (Dr. Kevin Price, Re-ang Lee, and Fangfang u) arrived at IMGERS for joint Chinese -American consultations on integration of remote-sensed information with the ground-based data being accquired at IMGERS, along the NECT and elsewhere in Inner Mongolia.

Lindsey remained in China, conducting research with Chinese colleagues until late August when she departed for a brief tour of Mongolia and returned to NREL, Sep. 19.

Jan Cipra has begun work with Diana Freckman and Bob Niles on their nematode pathogen research. GIS and soil survey data are being used to facilitate this study in Weld County, CO.

Dan Bumbarger has joined the Wall Lab as a technician. Dan recently graduated from Wright State University in Dayton (as in the Bosnia Peace Accord), OH, with a degree in Biology. He will be involved in all aspects of research in the lab, including a trip to Antarctica this winter. He didn't take long to settle in to Fort Collins, and the flood helped by destroying most of his possessions which were in storage. Welcome, Dan!!

Michelle Lee (a new non-student hourly employee from Ohio) is working with Tom Stohlgren and April Owen to summarie data on understory species diversity at ecotones. We are pleased to welcome Michelle!

Welcome to Jonathan Straube who has joined the NREL Computer support staff! Jonathan is a CSU Computer Science graduate and worked most recently for HSM, the company managing HSI

Health Plans. He is an active volunteer with the CSU Alumni Association, the Fort Collins Museum, and umpires youth baseball. Jonathan will be working full-time with Martin Fowler and his staff and helping out with all aspects of computer support, but particularly with PC-related requests.

Alan Shiller, geochemist from Southern Mississippi University visited Jill Baron and Eric Allstott, July 21, to go over trace metal and hydrology results from a collaborative research effort in the Loch Vale Watershed.

Scientists Appolinaire Moukam (Cameroon) and Jean Niyungeko (Kenya) visited NREL, July 7-Aug. , to learn the Century model and set up parameteriation of the model for TSBF Humid Tropical Sites. This work is part of the ongoing joint research with the TSBF program in Africa and the EOS, NASA program. They were sponsored by Bill Parton.

Jianming Niu, Assistant Director, Grassland Research Institute, Chinese Academy of Agricultural Sciences, visited NREL/CSU, Sep. -5. Dr. Niu's purpose was to visit several universities engaged in specialied research on grasslands ecology, including especially remote sensing, geographic information systems, and long-term ecological research sites.

Jenesio Kinyamario, Department of oology, University of Nairobi, Kenya, sponsored by Dennis Ojima, is visiting NREL from Aug. 20 through Dec. 31 to learn modeling techniques for simulation of tropical savannas. He will be training in ecophysiological technologies for C and water exchange. This work is a validation of savanna modeling with Century for the EOS project and Dr. Kinyamario will be working with Dennis Ojima, NREL, and Joe Trlica and Dennis Child, Rangeland Ecosystem Science Department, on some CENTUR applications.

Dr. Salvador Rebollo, Department of Ecology, University of Alcala, Madrid, Spain, is spending 3 months working with Dan Milchunas, Rangeland Ecosystem Science Department. Dr. Rebollo is working on a project assessing the potential interaction between large- and small-scale graing refugia in relation to seed production and dispersal on different soil textures in the shortgrass steppe.

Doug Grant is a new NREL grad student working on his Masters with Deb Coffin as his adviser. Doug is working on the modeling of Russian knapweed invasions research, with Harold Fraleigh. Welcome to NREL!

Cynthia Hedlund, GDPE, has earned an M.S. in Biology at California State Polytechnic University and aims to find a research project which combines ecosystem science with her interests in wildlife ecology and habitat conservation. She worked extensively in habitat preservation projects in Southern California and won awards and recognition for her work in research and conservation of the southern subspecies of the spotted owl. Her advisor is Mike Coughenour.

Gyury and Magdi Kroel-Dulay returned to Hungary after a year at CSU. Gyury was a visiting Ph.D. student on the US-Hungary project (PIs: Deb Coffin and Jim Gos).

Jeff Worden, GDPE, has been an educational program manager in natural history and conservation

in Kenya since 1995. He has worked extensively in Maasai land savannas, analying interactions between pastoralists and wildlife. Prior to that, he attended the University of Texas, Austin. He is interested in developing a research project which investigates the long-term viability of ecosystems, as influenced by interrelationships among landscape patterns, wildlife and people. Mike Coughenour is Jeff's advisor.

Lisa Schell is now a graduate student in Environmental Studies at Prescott College, Prescott, A. In addition, Lisa is a volunteer scientist for kids in the Science-By-Mail (SBM) Program. The topics this year are Imaging and Communication. This year's SBM will be in partnership with Charles Kuralt's "A Science Odyssey." She also volunteers at Service Net, locating resources for flood victims.

Ana Child attended the American Society of Naturalists, Systematic Biology and Evolution (ASN/SSB/SSE) annual meeting at the University of Colorado, Boulder, June 1 -1.

Amy Treonis, Ana Child, Diana Wall, and Bob Niles attended the Society of Nematologists (SON) annual meeting in Tucson, A, July 1 -23, where Ana assisted in teaching a nematode molecular biology workshop with Drs. Tom Powers and Brad Hyman at the SON annual meeting. They then participated in the NSF Workshop on Survey and Inventory of Soil Nematodes in Tucson, A , July 23-25.

Tom Stohlgren received □5, via the Cooperative Agreement with the Biological Resources Division of the USGS (formerly the National Biological Service) for a one-year study funded by the Environmental Protection Agency (EPA) titled "Summitville Mine Ecological Risk Assessment: Vegetation and Soils Study." This is part of a □12,03 study in which Dr. Howard S. Ramsdell (CSU) is receiving □53,959 to conduct a livestock exposure investigation.

Imanuel Noy-Meir and Dan Milchunas received □131,7 in funding from the U.S. -Israel Binational Science Foundation for the proposal titled, "National Graing Refuges and Grassland Biodiversity."

Dan Binkley and Mike Ryan (USDA Forest Service) received a grant from NSF-Ecosystem Studies to continue their research in Hawaii. They are using fast-growing stands of Eucalyptus to investigate why aboveground production declines in forests at relative young ages. The trees being studied are now 3 1/2 years old, and taller than 20 m. The 3-year grant should allow them to follow the trees from the stage equivalent to productive assistant professor, respectable associate professor, and declining-productivity-but-impressive-bulk full professor.

Indy Burke, Gary Maciel (Chemistry Department) and Bill Lauenroth with a □177,000 subcontract to Dale Johnson (Univ. of Nevada, Desert Research Institute) received □900,000 in funding from NSF-Ecosystems Program for a 3-year proposal titled, "Ecosystem Significance of Soil as a Long Term Sink for Anthropogenic Additions of N."

Romulo Menees, Ted Elliott and Ignacio H. Salcedo (Federal University of Pernambuco, Brail) received a grant from the WWF to do some biogeochemistry experiments on agrosylvopastoral systems in semiarid northeastern Brail. The proposal is titled, "Agrosilvopastoralismo no semi -arido: Sustentabilidade atraves da influencia de especies arboreas nas caracteristicas do solo e na producao de biomassa pelo estrato herbaceo."

Dan Milchunas and Jim Detling submitted a proposal titled "Collaborative Research: Effects of Different-sied Herbivores on Nitrogen Cycling in Grasslands: A Cross Site Study" to NSF.

Tom Stohlgren, Dan Binkley and Reich submitted a pre-proposal to EPA titled "Nitrogen from Air Pollution Accelerating the Invasion of Exotic Plant Species and the Loss of Native Plant Diversity."

Two preproposals were submitted to the National Park Service (NPS)/Environmental Protection Agency (EPA) DISPro competition: "The Biological Response to Atmospherically-deposited Nitrogen in Rocky Mountain Lakes and Streams" by Jill Baron and Alexander Wolfe (INSTAAR), and "Spatial and Temporal Variability in Nitrogen Cycling and Expore in Western Parks Sensitive to Nitrogen Saturation" by Jill Baron (NREL), Paul Brooks and Donald Campbell (USGS-WRD).

Jim Ellis and Mike Coughenour submitted a proposal to NSF titled "Climate Change Effects on Ecosystem Dynamics and Human Land Use: Taiga, Steppe, & Desert."

A continuation proposal titled "VEMAP Phase II" was submitted to NASA by Dennis Ojima and Bill Parton.

Tom Hobbs and John Gross submitted a continuation proposal titled "SCOP: A System for Conservation" to the Colorado Division of Wildlife.

Keith Paustian and Ted Elliott submitted a proposal to DOE titled "Soil Organic Matter Dynamics and Management Decision Making in an Enriched CO2 Environment."

Dennis Ojima and Bill Parton submitted a continuation proposal titled "Century Erosion Study" to DOI/USGS/BRD.

A proposal titled "Spatial Ecosystem Modeling of ellowstone Bison and Their Environments" was submitted to USDI/USGS/BRD by Mike Coughenour.

Francis Singer and Ted Elliott submitted a proposal titled "Ecological Studies of the Jackson Bison and Elk Herds" to USGS.

Kathy Galvin and Jim Ellis submitted a proposal to NOAA titled "Uses of Climate Forecast Information in the Livestock Sector of the Arid Regions of South Africa."

John Gross submitted a continuation proposal to the Colorado Division of Wildlife titled "Ranking Conservation Priorities of Vertebrates in Colorado."

Mike Coughenour submitted a proposal titled "Ecosystem and Landscape Interactions in Alaskan Geese Graing Systems" to NSF/Polar Programs.

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Over the summer, Bob Niles taught a six-week course "Introduction to Word 97 and Excel 97' to adult learners at the Education of Life Training Center in Fort Collins.

Jo House (previous visitor at NREL from King's College London) is living her pseudo-hippie dream.... she has done the interior of her VW bus in blue and UV pink fake fur to complement the purple and yellow exterior.

She took it to a club meeting at Camber Sands and won best van, best paint job for the new shiney purple and yellow look, and best interior for all the funky fake-fur coverings and linings. Jo says, "I know that probably isn't too interesting for most of you, but hell, we all have to have an obsession about something!"

I am so thankful for your help! Presently, I am still living at a friend's house with my two cats, Tiger and Whitie and storing in his garage a few boxes of what I salvaged from the flood (mostly clothes and little personal things that I picked up in the rubble, or dug out of the mud). In spite of my efforts, I did not find an affordable place to live for the three of us, but I have hope that with persistence, I will find it. I will keep you posted. Thank you again!! Michele Nelson

Stanley Auerbach, Retired, Founding Director, Environmental Sciences Division, Oak Ridge National Laboratory Director, Eastern Deciduous Forest Biome Program (197 -1975).

NREL to me means George Van Dyne -- a remarkable individual. After he joined my staff at ORNL he shook up the system when he announced that full time researchers should be able to produce at least one research paper a month!--and George proceeded to do so. Of course he had tons of range studies data that he had brought with him and proceeded to work over into open literature publications. His capacity for study and learning was fantastic. George learned his ecosytem ecology at ORNL and proceeded from there to turn a good part of American and international ecology in a new direction.

After the biome programs were organied and established he and I had numerous disagreements over the programs -- organiation, objectives, approaches, etc. He argued that the EDFB should be conducting production and biomass studies as was being done in the grasslands -- didn't seem to appreciate that forests are not easily conducive to large scale harvesting (like hay baling). On the other hand when I would visit the Pawnee site, I asked to see the watersheds -- and was shown these semi-dry basins which, I was told, would function similar to our eastern watershed studies -- which of course evoked derisive chuckles from us visitors. These kinds of arguments went on, with nobody agreeing -- but, of course, were part of the competition at the time.

But -- when I got word that George had obtained a number of American Bison from the Department of Interior that would be fistulated and used for rumen/ forage studies at NREL -- I threw in the towel -- no way could I beat that!

George van Dyne not only designed, obtained funding, and almost literally built the NREL himself -- but he created a marvelous research organiation which has contributed immeasureably to our knowledge and scientific understanding of grassland and range ecology. He deserves to be remembered.

Christine (Procter-Gregg) Bernat, Louisville, CO

There aren't many places in the world with so much diversity! Most job descriptions don't include collecting Bison saliva, monitoring corn patches, sitting for long hours in prairie dog towns, transporting grass (B. gracilis) across state lines, riding round up, or going to live with nomads in the Rift Valley, having armed escorts go with you to establish test plots, having stolen cattle held over night in your "enclosures" watching a hyena watch you do your private business under a bush, chasing would-be thieves down the street in Nairobi (they had my research notes!)... the memories go on and on. But the best memories are of the finest group of folks I've ever had the pleasure and honor to know and work with. Thanks NREL!

Spatial scales are confusing, temporal scales are worse, But it's the bathroom scale that never lies, and is sure to make you curse.

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