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## SAVING AFRICAN AND NORTH AMERICAN WILDLIFE WITH THE SAVANNA MODEL



In February, NREL scientists, supported by a grant from USAID GL-CRSP, together with colleagues from Nairobi-based International Livestock Research Institute (ILRI) and Future Harvest (an organization working to build public understanding about the links between the environment and agriculture), unveiled a new tool aimed at reversing the rapid decline in wildlife numbers in East Africa and helping balance elk and bison populations in the western United

States. The tool is a computer-based model called SAVANNA. SAVANNA took 15 years to develop and is the world's first ecological model that is comprehensive enough to include hundreds of variables on wildlife, plants, livestock, soil, climate and human activity. The SAVANNA model can then use these variables to make predictions from five to 100 years into the future for areas as large as Kenya or western North America or as small as a 50-yard-wide watering hole.

SAVANNA was introduced in a Future Harvest report entitled "The SAVANNA Model: Providing Solutions for Wildlife Preservation and Human Development in East Africa and the Western United States" by senior research scientist **Dr. Michael Coughenour** of NREL, and **Drs. Robin Reid** (NREL alum) and **Philip Thornton** both of ILRI in Nairobi, Kenya.

SAVANNA is focusing on land use issues in areas both inside and around Maasai Mara National Reserve, Amboseli National Park in Kenya, and the Ngorongoro Conservation Area in Tanzania, which are part of the Greater Serengeti Ecosystem. The model is also being applied in the western United States to Wyoming's Yellowstone National Park, Colorado's Rocky Mountain National Park, and Montana's Pryor Mountain Wild Horse Range. Often small or fragmentary, many of the parks have reached their maximum carrying capacity for bison, elk and wild horses. "The problems in the American West and in Africa are vastly different," said Coughenour. "In the western United States, conservation challenges are the result of affluence, whereas in East Africa those challenges are more nearly the result of poverty. However, both concern human-driven changes in wildlife and ecosystems."

The conservation areas in East Africa carry the greatest large mammal diversity in Africa, yet they also coincide with the areas of greatest human population increase. Kenya and Tanzania have tripled their populations since 190. This factor, combined with an average income of US 1 a day, has led to increased subsistence and commercial farming, poaching and urbanization. As a result of increased farming in or near wildlife conservation areas, conflicts arise as wildlife trample crops and farmers protect their property by killing wildlife. SAVANNA will help planners determine where and how farming, pastoralism and wildlife can co-exist. The local non-governmental organizations and communities around Maasai Mara National Reserve in Kenya are already working to create a long-term land-use planning program in the Mara ecosystem using SAVANNA.

## NREL IN THE LIMELIGHT

### **Theobald Maes the N Ties**

NREL postdoc **Dr. Daid Theobald** was on the cover of the May 30<sup>th</sup>, New York Times as part of an article on the massive Los Alamos, New Mexico fire. According to the article, in California and Colorado alone, about three million people face at least a moderate wildfire risk, including the many who have built new homes in recent years in areas like Jefferson County, west of Denver. Dave's study focused on areas within two miles of forest boundaries. He found that population densities in those once remote parts of the state had quadrupled from 190 to 1990, even before the last decade's building boom.

### **Scientists Published in SCIENCE**

**Dr. Diana Wall** NREL Director, and **Dr. N. Lero Po**, assistant professor of biology, are among the co-authors of "Global biodiversity Scenarios for the Year 2100" which aims at determining the factors that affect biodiversity, the habitats that are susceptible to those factors and then predicting the change to the earth's biodiversity between now and 2100. See *Science* 2: 10 -1.

**Dr. Dae Schiel**, along with NREL scientists **ill Parton Dennis Oia Robin ell** and others, had their paper entitled "Contribution of Increasing CO<sub>2</sub> and Climate to Carbon Storage by Ecosystems in the United States" published in *Science* 2: 200 -200.

## AWARDS

### **Woens Caucus Aard**

NREL Director **Dr. Diana Wall** was recognized on March 23 by the Academic Faculty and Administrative-Professional Women's Caucus for her outstanding contributions to women on campus. Diana exemplifies the goals of the award with the university-wide scope of her activities and her contribution as role model to faculty, administrators and students. According to Dr. Jill aron, NREL scientist, Diana crosses disciplinary, institutional and even geographical boundaries that would stop others. She has served on international initiatives such as chairing the DIVERSITAS International biodiversity Observation Year of 2001 -2002. She is also president of the Ecological Society of America for 1999-2000, and is on the oard of Directors of the Council of Scientific Society Presidents.

### **Excellence in Ecosste Science**

**Dr. Daid Colean**, professor and research scientist at Colorado State University from 192 -5, has become the second recipient of NREL's Award for Excellence in Ecosystem Science. Coleman, recognized for his pioneering studies in plant roots, microbes, soil fauna and soil physical properties, was presented with this distinguished honor on March 13 in conjunction with NREL's External Advisory Committee meeting. During his tenure here, Coleman was a senior research scientist at NREL and professor of entomology and zoology. His contributions to soil ecology have been recognized by a Professional Achievement Award from the Soil Ecology Society and his election as Fellow of the Soil Science Society of America. Dave is now at the Institute of Ecology at the University of Georgia in Athens.

### **Daid H. Sith Aard**

**Dr. Daid Theobald** was awarded a David H. Smith Post-doctoral Research Fellowship from the Nature Conservancy in April. This is a two-year fellowship designed to foster linkages between conservation biology theory and practice. Dave will continue to be mentored by Dr. Tom Hobbs.

### **AG Editors Citation or Excellence in Reereeing**

**Dr. Jaes Slusser** received this award from American Geophysical Union for his concientious reviewing of submitted papers. The purpose of this citation is to express publicly the gratitude of AGU to those whose reviews have been particularly commendable.

## HAPPENINGS

### **Chinese and S Ecologists Meet**

On May , **Genea Chong** presented a paper to a Chinese delegation at righam Young University. The four -week ecological economics and GIS seminar was part of a cooperative agreement between the US Department of the Interior and its Chinese euivalent, and was hosted by the USGS.



### **The International Biodiversity Observation Year 2001 2002**

Preparations for a global year to focus attention on biodiversity are being coordinated at NREL. **Dr. Diana Wall** chairs the DIVERSITAS International Biodiversity Observation Year (IOY) 2001 -2002 and its Secretariat is managed by **Dr. Gina Adas** . At the core of the IOY is a portfolio of diverse research, informatics, education and outreach projects that span more than 50 countries. IOY will highlight and integrate these projects, advancing a holistic understanding of biodiversity and its interrelationships with society and increasing transfer of science-based biodiversity information to public and policy spheres. More information on the IOY, its projects, and how to get involved is available from the IOY webpage <http://www.nrel.colostate.edu/iboy> .

### **Estes Park Workshop**

**Drs. Tom Hobbs, Dennis Oja, Mie Coughenour, Alan Coich** , and **Dae Theobald** led a workshop entitled "An Integrated Assessment of the Effects of Climate Change on Rocky Mountain National Park and its Gateway Community" on May 1 in Estes Park, Colorado. This project is funded by EPA for research in the RMNP area. The principal aim of this research is to assess the consequences of changing climate and shifting patterns of land -use for this important conservation area. The purpose of this workshop was to educate Estes Park citizens and business owners about the potential impacts of climate and land use change, and to seek their input on potential responses to climate change. Stakeholders were invited to share their reactions, thoughts, and ideas during breakout sessions. The goal of these sessions was to identify key stakeholder concerns and ideas that can be used constructively by the scientists in focusing their research towards topics that hold the greatest interest to stakeholders. About 20 Estes Park area citizens participated in this workshop, as well as several project scientists.

## GRAD STUDENT NEWS

**Raul Peinetti** defended his PhD Dissertation on February 2. It was titled "Riparian willow ( *Salix* spp.) dynamics and its interaction with environmental and biological factors in the elk winter range of Rocky Mountain National Park (Colorado) - a multi-scale analysis."

**Arlo Dene** a graduate student from Belgium, will begin work with Dr. Keith Paustian on her PhD through an NSF - grant titled: "Aggregate turnover controls on soil organic matter: The influence of management and mineralogy."

**Dr. Tom Hobbs** new PhD student, **ate Searle** , from Plymouth, UK, will be testing models of foraging behavior of large herbivores as part of Tom's new NSF project, "Collaborative Research: Responses of Mammalian Herbivores to Spatial Heterogeneity Expressed at Multiple Scales."

**Todd Wotoic** has just joined **Dr. Diana Walls** lab as a PhD student. He comes to NREL from Northern Arizona University where he received his MS studying soil microarthropods in pinyon-uniper communities.

Congratulations to NREL grad student **Stacy Linn** . She married Erik Martinson, a Research Associate in Forest Sciences, on May 20.

## PEOPLE

### **Goodbye**

A fond good-bye to **Cind Fudge** and **Terri Stutan** , long-time NREL employees. Cindy worked at CSU from 195 to March 2 of this year. She served as a Program Assistant I for NREL before moving to Grove, Oklahoma. Terri worked

at CSU from 1993 to April 30 of this year. She was an Accounting Technician II for NREL before deciding to stay home with her children. Good luck and thanks, Cindy and Terri

### **Hello to Heidi Stelter**

And a warm hello to **Heidi Stelter**. Heidi is a new post doc with **Drs. Dan Inle** and **ob Stottleer**. A recent graduate of the University of Colorado, Heidi is working on nitrogen relations in the tundra at Niwot with Bill Bowman. In the summers, she will be at the Noatak National Preserve in NW Alaska. Welcome, Heidi

### **Part for Ji Gibson**

NREL threw former director **Dr. Ji Gibson** a 40<sup>th</sup> birthday bash in May. Jim was director of NREL from 1963 to 1999. Jim was able to catch up with colleagues and friends at the well-attended event.

### **NREL Boston Marathon Runner**

Congratulations to grad student **Joce Caca** who ran (and finished) the Boston Marathon with a respectable time of 3:39:2. Well done



### **David Igelow**

We are all saddened by the recent loss of one of our best colleagues and friends. NREL Scientist David Igelow died of complications of lymphatic leukemia Saturday, June 11, at the Poudre Valley Hospital in Fort Collins. Dave was 50 and has been with the NREL for 30 years - first as a student technician, then as a research scientist upon completion of his degree in animal science in 1972.

Dave worked first in the Chemistry/NREL analytical laboratory and then with Bob Woodmansee's nitrogen project where he was a technician working with Dave Schimmel, a graduate student. In 1979, Dave joined Jim Gibson's National Atmospheric Deposition Program (NADP) where he served as data manager and quality assurance. In this role, Dave developed a data management and dissemination system for this long-term monitoring program which placed the program in the forefront internationally. In 1992, Dave joined Jim Gibson as Co-PI on a long-term monitoring program for ultraviolet radiation. Again, the program has gained an international reputation for its web-based "next day" data delivery system developed by Dave.

During his years at the NREL, Dave was active on a number of NREL committees, worked with the public schools to help teach modern computer techniques, was an active member and leader in the Larimer County Search and Rescue, and served on a number of national scientific committees.

Dave was one of those individuals who was always available to help others and he will be greatly missed. He is survived by his wife Cynthia and son and daughter, Dennis and Caroline.

## **SUPPORT NREL**

### **Man Thanks to Dr. Bert Cushing**

**Dr. Bert Cushing** generously donated many volumes of the journal *Ecology* to the NREL graduate student library. The library now has a complete set, 1922-1999, as well as several years of *Ecological Applications* and *Ecological Monographs*. Our thanks Dr. Cushing

### **Donations Welcome**

Your gifts help NREL remain an internationally recognized ecosystem center. Contributions help NREL to stay competitive with new advances in computer, lab and field equipment for landscape and global analyses. Graduate students benefit from scholarships funded by donations and from interdisciplinary training on advanced equipment needed for analysis of ecosystem components across a breadth of disciplines and scales. Many thanks to all you recent NREL donors

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