

WINTER 2009-10

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- Dr. Tinker describes the impact of bark beetle outbreak to the Governor
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- Botany faculty involved in assessing the impacts of bark beetle outbreak
- Botany Department welcomes Drs. Burke and Lauenroth

Botany Faculty and Students Discuss Beetle Outbreak with Gov. Freudenthal



Pictured along with Wyoming Governor Freudenthal (far right) are Dr. Tinker (far left) and graduate students David McKenzie and Sara Brown (4th and 5th from left). Photo by Dr. Indy Burke.

Dan Tinker and **Ingrid (Indy) Burke**, both from our department, were recently asked to organize and lead a field trip for Governor Dave Freudenthal and several members of his staff to observe the impacts of the current bark beetle out-

break in Wyoming. Also present on the trip were Botany students **Sara Brown** and **David McKenzie**, Wyoming State Forester Bill Capser, and other members of the Wyoming Division of Forestry. The group visited several forest stands in

the Medicine Bow National Forest, near the settlement of Fox Park.

Dr. Tinker described the biology of the bark beetles that are currently abundant there, including the mountain pine beetle, spruce beetle, Douglas-fir beetle, and western balsam bark beetle. All are native species. Dan also discussed several factors that have been identified as contributing to the extent and severity of the current outbreak, which is killing many trees at elevations that were once thought to be too cold in the winter for survival of the larvae. The group discussed a range of post-disturbance management options to reduce hazards around campgrounds, roads, and power lines. They also visited private property where considerable effort and funds have been expended in an attempt to protect mountain homes from wildfire.

Notes from the Department Head

Greetings from Laramie! After three years as an Associate Dean for the College of Arts & Sciences, I am back as Department Head. I want to thank Professor Steve Miller for his service as Head from 2006 to 2009, a very interesting and challenging period. In 2006 the Wyoming economy was roaring along, but by the end of Steve's term the State and the University were facing some serious economic challenges. We know it wasn't Steve's fault!

Before moving to the Dean's Office, I knew that our department was a good one. However, as I gained a deeper un-

derstanding of the College and became more familiar with the other 28 departments and programs, it was clear that we are exceptional. As a group of scholars and students we are very productive, have a strong mutual respect for one another, and are unusually collegial. This newsletter is intended to keep you up-to-date on some of the many exciting things going on in Botany at Wyoming. We'll send another one soon.

We would love to hear from you, so please send us your personal and professional news.

Best Wishes to All for a Happy and Healthy 2010!

- Greg Brown



Hibiscus rosa sinensis.
Photo courtesy: Williams Conservatory, UW.



Dr. Steve Jackson,
Professor of Botany,
and Director, Program
in Ecology.

**Steve published 3
articles in *Science*
and 1 article in
PNAS.**

Photo courtesy: USDA Forest Service



**For more
information about
recent bark beetle
outbreak visit:**

**[http://
www.fs.fed.us/r2/
bark-beetle/
index.html](http://www.fs.fed.us/r2/bark-beetle/index.html)**

**[http://sif-
web.state.wy.us/
forestry/
health2.aspx](http://sif-web.state.wy.us/forestry/health2.aspx)**

Publication Highlights

Scholarly publications in high impact journals are essential for enhancing the reputation of any academic department. Such publications not only serve as a testimony for the research accomplishments of the faculty members and their students, but they also raise the profile of the department and facilitate the acquisition of highly competitive research grants.

The research interests for each faculty member and a list of recent papers can be viewed on their respective web pages, which are accessible from our department's webpage:

<http://www.uwyo.edu/botany>

In this issue of the newsletter we highlight the work of Professor **Steve Jackson**. During

the past year Steve was first invited by the prestigious journal *Science* to write an essay describing the work of Alexander von Humboldt, the 19th century explorer and scientist who, Steve argued, laid the foundation for global change biology and earth system science.

Then, *Science* invited Steve and his Australian colleague, Dr. Richard Hobbs, to review the implications of paleoecological information for ecological restoration and conservation. Later in the year, he co-authored another paper in *Science* with his colleagues from the University of Wisconsin. This third paper offered evidence that the decline of mastodons some 14,000 years ago led to a shift in vegetation and fire regimes in some parts of North America.

It is a rare feat to have three papers published in *Science* in the same year, but to top things off, Steve also published a paper in the prestigious *Proceedings of the National Academy of Sciences*. This paper discussed ecological responses to climate change in pre-historic times and their implication for future climate change scenarios.

Professor Jackson teaches courses in ecology and is the founding director of UW's new Program in Ecology (PiE), a cross-campus graduate program that enables students to obtain a Ph.D. in ecology. During the past year he has given invited lectures at Minnesota, Michigan, UC-Berkeley, and at various meetings in New Mexico, England, and Estonia. Steve was also selected recently as a Fellow of the American Association for the Advancement of Science.

Bark Beetle Research

Dan Tinker and his colleagues, Bill Romme (Colorado State University) and Monica Turner (University of Wisconsin—Madison), together with their students, are studying the ecology of bark beetle outbreaks and their influence on fire behavior and ecosystem structure in the Greater Yellowstone Eco-

system. Their research indicates that, thus far, approximately 55% of the area in mature conifer forest has experienced tree mortality attributable to bark beetles. It appears that mountain pine beetles were more likely to colonize lodgepole pine trees that had been injured by fire than those

that had not.

Brent Ewers and **Elise Pendall** and their students have started a new study on how bark beetles and blue stain fungi are impacting the hydrology, greenhouse gas production, and vegetation of Rocky Mountain conifer forests.



Photo courtesy: USDA Forest Service

Early results from the Medicine Bow Mountains show that the fungi, which the beetles carry to uninfected trees, reduce tree water use by half only one month after infestation. The trees typically die within a year as a result of xylem blockage by fungal hyphae. Other early results show that the emissions of greenhouse gases such as CO₂ and N₂O are increasing more slowly than expected while methane is staying relatively constant.

New Faculty

Dr. Ingrid (Indy) Burke is a new Professor of Botany and the current Director of UW's Haub School and Ruckelshaus Institute of Environment and Natural Resources. Prior to coming to UW, she was a Professor and University Distinguished Teaching Scholar in the College of Natural Resources at Colorado State University. At CSU Indy directed the Shortgrass Steppe Long Term Ecological Research team for six years, as well as other interdisciplinary research teams funded by NSF, EPA, NASA, and NIH. She was designated a U.S. Presidential Fac-

Dr. William Lauenroth recently came to our department from Colorado State University (CSU). At CSU, he was the co-Director of the interdisciplinary Graduate Degree Program in Ecology and a Professor in the Department of Forest Rangeland and Watershed Stewardship.

He taught courses in Ecogeography, Grassland and

Shrubland Ecology, and Ecosystem Ecology. Professor Lauenroth is interested in plant community ecology and ecohydrology of arid and semiarid regions. His past work has focused on grasslands of the Great Plains, Argentina, and the Columbia Plateau of the Pacific Northwest. He is the author or coauthor of

Shrubland Ecology, and Ecosystem Ecology.

He is the author or coauthor of

logical Applications, is a member of the Advisory Committee for the Governor's *Building the Wyoming We Want* program, is on the board of the Sand County Foundation, and is the new chair of the advisory committee for the Greater Yellowstone National Environmental Observatory Network (NEON) site. In addition, Indy serves as an Ex Officio member of the council for UW's new School of Energy Resources. We're proud to tell you that Indy became an ecosystem scientist while earning her Ph.D. in our department, working with Professor Bill Reiners.

more than 170 journal articles, 52 book chapters, and editor or coeditor of 5 books. His most recent book project is entitled *Ecology of the Shortgrass Steppe*, edited in 2008 with Botany Professor Indy Burke. He is a Fellow of the American Association for the Advancement of Science and a member of the Institute for Scientific Information's Highly Cited Authors.



Current Faculty, Specialization, and Year of Appointment

Ron Hartman, Floristics, PhD *University of Texas*, 1977

Bill Reiners, Ecosystem Ecology, PhD *Rutgers University*, 1983 (half-time)

Greg Brown, Plant Systematics, PhD *University of Arizona*, 1985

Steve Miller, Fungal Systematics & Population Biology, PhD *Virginia Polytechnic Institute and State University*, 1990

Steve Jackson, Quaternary Plant Ecology & Biogeography, PhD *Indiana University*, 1995

Brent Ewers, Plant Ecophysiology, PhD *Duke University*, 2002

Elise Pendall, Ecosystem Ecology, PhD *University of Arizona*, 2002

Ken Driese, Remote Sensing, PhD *University of Wyoming*, 2002 (half-time)

Dave Williams, Isotope Plant Ecology, PhD *Washington State University*, 2003 (joint appointment with Department of Renewable Resources)

Alex Buerkle, Evolutionary Genetics, PhD *Indiana University*, 2004

Mark Lyford, Paleoecologist and Director, Life Sciences Program, PhD *University of Wyoming*, 2004

Dan Tinker, Forest and Fire Ecology, PhD *University of Wyoming*, 2005

Kiona Ogle, Ecological Modeling, PhD *Duke University*, 2006 (joint appointment with Department of Statistics)

Cynthia Weinig, Evolutionary Genetics, PhD *Indiana University*, 2007 (joint appointment with Department of Molecular Biology)

Naomi Ward, Microbial Genomics, Ecology & Systematics, PhD *University of Warwick*, 2007 (joint appointment with Department of Molecular Biology)

Indy Burke, Ecosystem Ecology, PhD *University of Wyoming*, 2008

Bill Lauenroth, Plant Community Ecology & Ecohydrology, PhD *Colorado State University*, 2008

Tom Minckley, Paleoecology and Biogeography, PhD *University of Oregon*, 2008

Ramesh Sivanpillai, Remote Sensing, PhD *Texas A&M University*, 2008 (joint appointment with Wyoming Geographic Information Science Center).

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Cymbidium hybrid - miniature pink. Photo courtesy: Williams Conservatory, UW.

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John Turlo

- Thank you for your support!

An Old-timer's Perspective

- Dennis Knight, Former Head and Professor Emeritus

Some of you were associated with our Botany Department before I arrived in 1966, but not many. It's been exciting for me to see so many changes during the last 43 years. Through several boom and bust cycles in the State's economy, our students have continued to be successful. That's our goal.

When I first arrived there were four other faculty members in the department (Martha Christensen, Henry Northen, Ted Porter and Gene Pratt). Bill Solheim had retired by that time but he was around almost every day. Now there are 19 on the faculty and, amazingly, 14 of them have been hired in the last eight years--since I retired! Explaining how that happened is a long story. Looking back on the time that I have been at UW, I can identify periods when our department has been, shall I say, not so strong, and when we have been delightfully strong. I want you to know that, in my opinion, our department has never been stronger than it is now. If you have to be convinced, look at the web pages for each of the faculty members.

Adding the Ph.D. program in 1970 greatly enhanced our ability to attract good faculty and good students, and our teaching and research labs in the Aven Nelson Building have been improved over the years, especially with the addition of the Louis and Terua Williams Conservatory. But now, encouraged by UW's administration, the Botany faculty has spent hours developing a vision for the future that includes an entirely new building. The plan also includes several endowment funds, some small and some large, that would enable our students to do even better after they graduate. I hope you will consider contributing to these funds to whatever extent you can. No matter the size of your gift, it will show the administration that we have your support. Send your contributions to Greg, and if you would like to talk about planned giving or a major gift that could result in naming opportunities, call him at 307-766-2380.

Above all, be sure to stay in touch and stop for a visit if you are in Laramie.