

Research

Around the World

Global Tree Improvement Ventures

For **David Karnosky**, professor of forest genetics and director of the Ecosystem Science Center, the world's forests are his laboratory. Currently on sabbatical in Australia, Dave has studied the improvement of trees on four continents this year: North America, Africa, Europe, and Australia. Dave is best known for his work on the impacts of air pollution and global change on the structure and function of forest ecosystems.

While in Australia, Dave has presented invited seminars at Southern Cross University, the University of Tasmania, Queensland University, and the Department of Primary Industries. "This has been a fantastic time to reflect on where my research is headed after our Aspen FACE project winds down," says Dave. "Water, or the lack thereof, is the key in global change for much of the world, and that is particularly true for Australia."

As a recognized leader in global change research, Dave was invited to address a prestigious Royal Society (London) symposium on the impacts of ozone on forest ecosystems in May and to receive an honorary doctorate from the University of Tartu in Estonia last fall. "I do my research because I enjoy it, but it is very nice to be acknowledged in this way," he says.

Dave has also developed an active research effort aimed at improving African mahogany. This research is Dave's labor of love. Work conditions are primitive and difficult, but the rewards of helping restore the indigenous African mahoganies, which have been harvested unsustainably to the point of commercial extinction, are terrific.

While in Australia, Dave is visiting several labs and nurseries involved in growing, propagating, and incorporating integrated pest management (via promoting protective ants) for the culture of African mahogany in Australia. "Establishing successful mahogany plantations in West Africa has not yet been successful because of the devastating shoot borer attacks. There is loss of commercial value of the trees due to the multiple stems produced

Vlady Alexeyev (left) and David Karnosky in an old larch and spruce plantation established by Peter the Great outside of St. Petersburg, Russia.



Garth Nickles (right), of the Queensland Department of Primary Industries, and David Karnosky examine an elite Araucaria in northern Queensland, Australia.



David Karnosky and villagers in Kranka, Ghana. Dave and others, including the chief worked in the mahogany trial in the dry savannah of Ghana.

after attack," says Dave, "but we are making real progress on this pest problem in Ghana. Former Michigan Tech graduate student **Emmanuel Opuni-Frimpong** (PhD 2006) is leading this IPM effort, which includes genetic selection and breeding, developing suitable silviculture systems, and cultivating protective ant colonies."

"Perhaps the most exciting new venture I am involved in this year is an attempt to develop a Russian forest ecosystem arboretum in the Upper Peninsula of Michigan," says Dave. This idea came about as part of a visit he made in August to St. Petersburg, Russia, after he was contacted by well-known Russian ecologist Vlady Alexeyev. "Our idea is to create rather large blocks of the main Russian tree species as a germplasm reserve. We would also have examples of the species planted on our campus."

Vlady and Dave are attempting to secure funding to get this concept off the ground. "Vlady is well respected in Russia and he feels we can tap a Russian entrepreneur to get this going," Dave commented.

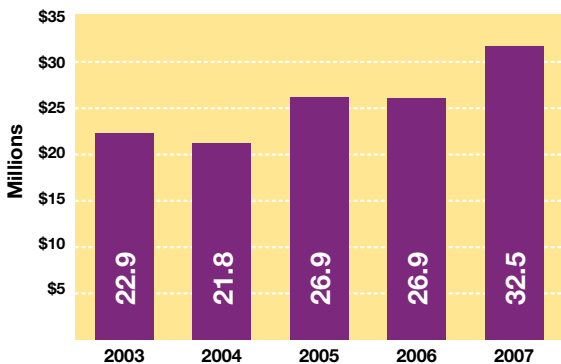
While in Australia, Dave and his wife, Sherry, have also been enjoying the famous Aussie hospitality. "Both Sherry and I have been enthusiastically met wherever we have traveled in Australia, so it has really been a wonderful experience."

Research funding supports our scholarly efforts within the school and the University. From June 1, 2006, through September 30, 2007, 123 new research grants were awarded, and a total of over \$8,065,000 in external research funding was secured.

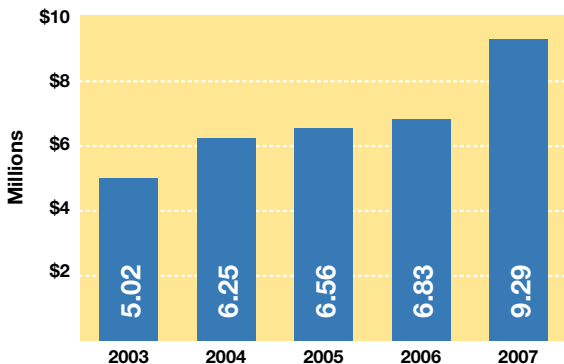
This high level of support was achieved due to the hard work of 19 tenured and tenure-track faculty, 6 research and adjunct professors, 8 postdoctoral researchers, 18 research scientists, and our 78 graduate students. It is the foundation of our graduate programs and our cutting-edge research in forestry, applied ecology, environmental sciences, biotechnology, and wildlife ecology.

School of Forest Resources and Environmental Science Research Funding

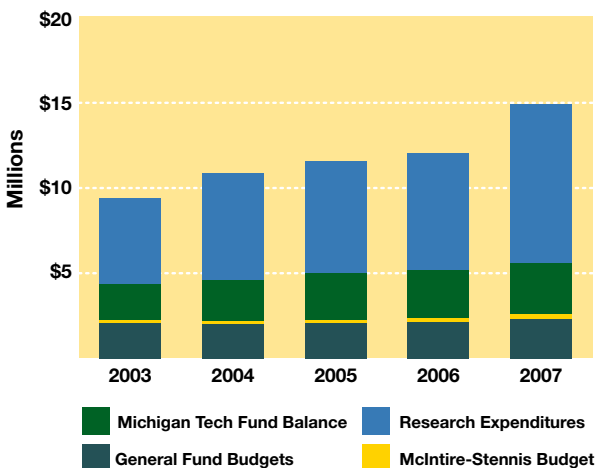
Available Research Funds



Research Expenditures



Five-Year Summary



Ranking Conservation Biology Research

by Jennifer Donovan, public relations director

“Conservation biology is a young but quickly maturing scientific discipline with a rapidly increasing number of scientific researchers. The field is in need of a ranking system that can be used by students, researchers and applied conservation biologists,” said Assistant Professor **Jackie Grant**. Grant is first author on a paper that proposes a scientific yardstick for measuring the conservation biology research productivity of universities.

Why rank conservation biology research? A ranking system provides a way to evaluate a university’s research performance, Grant explained. It also would be useful to students seeking a good conservation biology education and to conservation groups, federal agencies, and employers of conservation biologists, she said.

In the first comprehensive ranking of the strength of US and Canadian academic institutions’ conservation biology research, Grant and co-authors Julian D. Olden and Joshua J. Lawler of the University of Washington, Cara R. Nelson of the University of Montana, and Brian R. Silliman of the University of Florida measured the publication rates in six leading conservation journals of conservation biologists at 315 colleges and universities from 2000 to 2005. They also measured the number of times the published papers were cited by other researchers.

Based on this study, Michigan Tech is ranked thirtieth among the 315 institutions, in the top 10 percent, as published in the journal *Conservation Biology*.

Grant noted that the publication record of universities is only one measure of a conservation biology program. “It can by no means fully reflect the quality of education in conservation biology that institutions with dedicated teaching faculty can provide,” she said. “We have very dedicated faculty in the school.”



Joshi Named Director of Biotechnology Research Center

Associate Professor **Chandrashekhar P. Joshi** has been named director of the Biotechnology Research Center (BRC).

He replaces Professor **Chung-Jui Tsai**, who has served as the BRC director since August 2004 and as the interim director since December 2002.

“I am excited to lead this outstanding group of individuals who have come together to further research and education in the field of biotechnology,” Joshi said. “Under Dr. Tsai’s direction, the BRC has come a long way, and I hope to continue that momentum.”

Under Tsai’s leadership, the center has grown from a forest biotechnology-oriented group of three faculty members (formerly known as the Plant Biotechnology Research Center) to a twenty-three-member unit that includes faculty from across campus.

Joshi’s research focuses on cellulose biosynthesis in trees and has been funded by the National Science Foundation, Department of Energy, the USDA National Research Initiative, and the Consortium for Plant Biotechnology Research. He has been a principal investigator or co-principal investigator on \$6 million in grant funding at Michigan Tech and served as the school’s graduate program director for the last three years. He has also been a member on three NSF and DOE review panels and served on forty-five graduate student committees at Michigan Tech.

The BRC has seen significant growth in research productivity and is currently housing approximately thirty projects. The BRC’s annual research expenditures have consistently ranked in the top five among all research centers and institutions at Michigan Tech, averaging \$2 million annually.

Tsai credited the BRC’s success to its members. “This is a highly collegial and productive group of researchers,” she said. “They are among the best teachers on campus too, mentoring at all levels.”

For more information on the BRC, visit www.biotech.mtu.edu.