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Wyckoff, associate professor of biology, receives National Science Foundation grant to study Minnesota forests

Summary: Research focuses on ecosystem change in western Minnesota in the 21st century

(August 12, 2010)-Peter H. Wyckoff, associate professor of biology and environmental studies, received a National Science Foundation grant of \$262,761 over five years for his project “Life at the margins—impacts of climate change and herbivory on tree population dynamics at the prairie-forest ecotone.” Jon E. Anderson, University of Minnesota, Morris professor of statistics, and Janneke HilleRisLambers, University of Washington, Seattle assistant professor of biology, are collaborators on the grant.

A forest community ecologist, Wyckoff seeks to predict the fate of forests in western Minnesota over the next century. In the wake of expected climate change, some studies predict a rapid retreat of forest northeastward, but Wyckoff believes that many of the assumptions underlying this theory require more testing. To do so, he and his students will gather data at several sites along the prairie-forest ecotone, the transition zone between the two plant communities.

In Minnesota, the prairie-forest ecotone splits the state into one-third prairie and two-thirds forest. The location of the ecotone has shifted back and forth since the last ice age, at times mostly prairie and at other times almost entirely forested. Its future location has important implications for carbon sequestration, recreation and tourism, the timber industry, and farming.

Working in an approximately 250 mile transect ranging from just north of Lake Itasca in north central Minnesota to Camden State Park in the southwestern part of the state near Marshall, Wyckoff and a crew of 16 undergraduate research assistants will spend the next several summers collecting and analyzing data. The transect is long enough to include a substantial climate gradient and will provide key information needed to predict whether forest populations along the border will grow or shrink, given a changing climate, the spread of invasive species such as European buckthorn, a high number of white tailed deer, and new pests such as emerald ash borer.

Wyckoff and his team predict a gradual retreat of the ecotonal forest in response to near-term climate change and the difficulties aging tree populations, beset by deer and seed predators, may have in reestablishing themselves. As important as Wyckoff’s results are to Minnesota, “the forces we study are relevant to the entire stretch of the ecotone running from western Canada through the Great Lakes region of the United States,” he says.

Wyckoff will begin the project with a research sabbatical at the University of Washington, Seattle during the 2010-11 academic year working on a computer modeling portion of the project with HilleRisLambers.

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