

University of Minnesota Morris Digital Well

## University of Minnesota Morris Digital Well

---

Campus News Archive

Campus News, Newsletters, and Events

---

1-4-2010

### **Peter Wyckoff, professor of biology, and Rachel Bowers '03 identify a changing relationship between tree growth, drought, and carbon dioxide**

University Relations

Follow this and additional works at: [https://digitalcommons.morris.umn.edu/urel\\_news](https://digitalcommons.morris.umn.edu/urel_news)

---

#### **Recommended Citation**

University Relations, "Peter Wyckoff, professor of biology, and Rachel Bowers '03 identify a changing relationship between tree growth, drought, and carbon dioxide" (2010). *Campus News Archive*. 1393. [https://digitalcommons.morris.umn.edu/urel\\_news/1393](https://digitalcommons.morris.umn.edu/urel_news/1393)

This News Article is brought to you for free and open access by the Campus News, Newsletters, and Events at University of Minnesota Morris Digital Well. It has been accepted for inclusion in Campus News Archive by an authorized administrator of University of Minnesota Morris Digital Well. For more information, please contact [skulann@morris.umn.edu](mailto:skulann@morris.umn.edu).

Contact

Melissa Weber, Director of Communications  
Phone: 320-589-6414, [weberm@morris.umn.edu](mailto:weberm@morris.umn.edu)

Jenna Ray, Editor/Writer  
Phone: 320-589-6068, [jrray@morris.umn.edu](mailto:jrray@morris.umn.edu)

**Peter Wyckoff, professor of biology, and Rachel Bowers '03 identify a changing relationship between tree growth, drought, and carbon dioxide**

*Summary: Their research shows that west central Minnesota oak trees have become less sensitive to drought.*

(January 4, 2010)-By studying bur oak trees in three different west central Minnesota locations, Peter Wyckoff, University of Minnesota, Morris associate professor of biology, and Rachel Bowers '03 identified a changing relationship between tree growth, drought, and carbon dioxide (CO<sub>2</sub>). The Journal of Ecology recently published the results of their research, "Response of the prairie-forest border to climate change: impacts of increasing drought may be mitigated by increasing CO<sub>2</sub>."

Wyckoff, Bowers, and several other UMM students collected data from trees in Maplewood State Park, Glacial Lakes State Park, and Sibley State Park between 2002 and 2007. Typically, growth rings are larger when trees receive good light, adequate nutrients, and are free from disease. Tree rings are smaller when growing conditions are poor, especially in drought years. Through their study of growth rings, Bowers and Wyckoff found that west central Minnesota oak trees have become less sensitive to drought during the 20th century.

"Scientists have spent many years developing the techniques needed to reconstruct climate via tree rings," says Wyckoff. "The problem is that in the past few decades, the tree ring-climate relationships seem to have become 'decoupled' in many areas. The main cause seems to be increasing atmospheric carbon dioxide, which directly impacts plants. Carbon dioxide fuels photosynthesis, and increased carbon dioxide in the air can both speed-up plant growth and make plants less sensitive to drought."

Wyckoff notes that stomata, small holes located on the underside of leaves, play a key role in a plant's ability to withstand drought. Plants open and close stomata to take in carbon dioxide needed for photosynthesis. Plants growing in high levels of carbon dioxide reduce the amount of time their stomata are open, which reduces water loss and susceptibility to drought.

"The concept of 'water-use efficiency' is of crucial interest to farmers and foresters alike," states Wyckoff. "Carbon dioxide causes warming that will likely make west central Minnesota a drier place in the future. At the same time, increased carbon dioxide in the air makes plants growing in our region less susceptible to drought. The balance between these two forces will be crucial."

Through personal and academic discovery, the University of Minnesota, Morris provides opportunities for students to grow intellectually, engage in community, experience environmental stewardship and celebrate diversity. A renewable and sustainable educational experience, Morris prepares graduates for careers, for advanced degrees, for lifelong learning, for work world flexibility in the future, and for global citizenship. Learn more about Morris at [morris.umn.edu](http://morris.umn.edu) or call 888-866-3382.