

# Cedar Creek

## Long Term Ecological Research

The Cedar Creek Long Term Ecological Research Program (CDR LTER) uses field experiments, observations and theory to uncover mechanisms controlling ecosystem dynamics and functioning. Established in 1982, CDR LTER is part of a network of 26 LTER sites supported by the National Science Foundation.



**Cedar Creek Research Community:** Each summer over 100 undergraduate research interns, graduate students, post-doctoral scholars, technicians and faculty work together on long-term multi-investigator projects.

**Research:** Our research focuses on effects of the loss of biodiversity, of elevated atmospheric nitrogen deposition, of elevated atmospheric carbon dioxide, of climate change and of land use and other disturbances on the composition and functioning of grassland and savanna ecosystems.



**Housing and Research Facilities:** Cedar Creek offers a diversity of on-site housing options and provides researchers with office and laboratory space, equipment, extensive botanical and entomological collections and other facilities.

**Location:** University of Minnesota's Cedar Creek Natural History Area (CCNHA) is an experimental ecological reserve 35 minutes north of Minneapolis-St. Paul. Its 22 square kilometers (5400 acres) are a highly diverse mosaic of upland oak savanna, prairie, hardwood forest, pine and spruce forests, and of lowland ash and cedar forests, acid bogs, marshes, and sedge meadows.

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**Cedar Creek LTER**  
[www.cedarcreek.umn.edu](http://www.cedarcreek.umn.edu)

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For more information about the LTER Network, see:

[www.lternet.edu](http://www.lternet.edu)



**Educational Outreach:** Cedar Creek communicates the process and excitement of scientific research with K-12 students by offering their teachers two-week summertime Teachers Workshops. These help teachers develop hands-on ecological projects so



their students can better understand ecological science and its relevance to society.

In partnership with the Science

Museum of Minnesota, Cedar Creek helped design, plant and maintain an out-door “Prairie Maze” at the Science Museum where visitors can see how biodiversity affects ecosystem functioning.



Cedar Creek also hosts monthly guided public tours and, in cooperation with the City of East Bethel, established the “Fish Lake Nature Trail” with signs explaining the ecology of the region to public visitors.

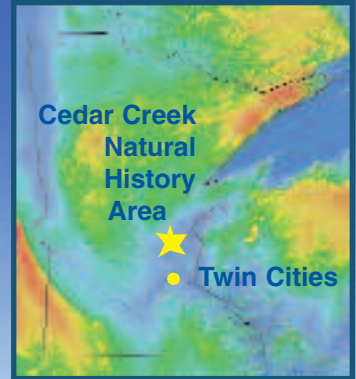


**Data Access and Information Management:** Data gathered by Cedar Creek are

accessible for use by others at our web site, [www.cedarcreek.umn.edu](http://www.cedarcreek.umn.edu), which hosts more than 15,000 pages and 10,000 images. There are extensive sections on the flora, fauna and insects of Cedar Creek as well as access to our data and a bibliography of our publications.

# Cedar Creek LTER Research

Cedar Creek research focuses on gaining a mechanistic and synthetic understanding of the functioning of ecosystems and of the impacts of human actions on the services that ecosystems provide society. We use long-term experimental and observational studies and related theory to determine the effects of the loss of biodiversity, invasions by exotic



species, elevated atmospheric nitrogen deposition, elevated greenhouse gases, climate change, and fire frequency on prairie grassland and savanna ecosystems.

These forces, their effects and the underlying ecological processes, mechanisms and feedbacks that lead to these effects are the foci of our research.

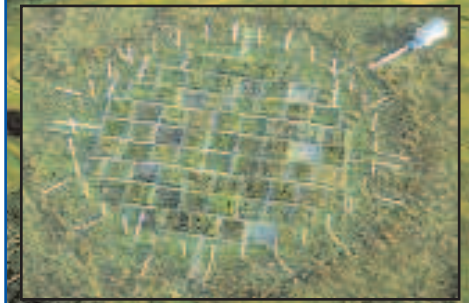
**Biodiversity:** The Cedar Creek biodiversity experiment – the first such field experiment in the world – determines how the number of plant species and their functional traits affect community and ecosystem productivity, stability, carbon sequestration, disease dynamics, soil fertility, and loss of nutrients to leaching.

## Atmospheric Nitrogen Deposition and Cessation Research:

Begun in 1982, this experiment documents the long-term impacts of low-level nitrogen deposition (and its cessation) on the species composition and biodiversity of plant and insect communities, and on ecosystem N and C dynamics.

## Biodiversity, CO<sub>2</sub> and Nitrogen (BioCON):

This experiment examines the impacts of reduced biodiversity, increased atmospheric carbon dioxide, and increased nitrogen deposition on prairie ecosystems.



## Biodiversity and Climate (BAC):

The direct and interactive effects of climate changes (elevated temperature and/or decreased precipitation) and plant species numbers on ecosystem composition and functioning and on invasion by exotic plant species are observed in the BAC experiment.



**Fire Frequency:** The oldest CDR LTER experiment, begun in 1964, studies the effects of fire frequency on our oak savanna and prairie grassland habitats, which had burned annually or biennially before settlement, but had not burned since about 1910 because of fire suppression.

**Prairie Bio-Energy:** We are investigating the use of restored high-diversity prairie as a sustainable source of biomass for bioenergy and as a method to remove and sequester atmospheric CO<sub>2</sub> in the soil.

**Broader Impacts:** Research at Cedar Creek addresses the long-term societal implications of human impacts on ecosystems. We seek to inform not only other scientists, but also the public and public officials of our research by communicating results through articles, public talks, interviews, governmental testimony and other means.



**Science and Society:** Through research, outreach and education, Cedar Creek strives to bridge the gaps between science, citizens, and government.



**Diversity and Openness:** Because intellectual diversity increases scientific creativity and productivity, we encourage others to pursue their interests at Cedar Creek and use Cedar Creek research as a base for their own work.

