

# Heartland Network

## Climate Change Resource Brief

Midwest Region  
Inventory and Monitoring Program  
National Park Service  
U.S. Department of the Interior



### Changing Climate

Change has always been a powerful force in nature. National parks help us understand our interconnection to a changing natural environment. We have seen unprecedented climate change in the last two decades and climatologists expect the rate of change to increase. As climate changes, significant changes in weather conditions will impact the natural environment by shifting patterns of precipitation, promoting extremes in storm behavior, altering seasonal temperatures, and influencing the triggers for bird migration, wildlife breeding, insect emergence, and plant dormancy.



Climate forecasters expect the Midwest to experience increasing storm severity.

### Assessing impacts of change

#### Vegetation Monitoring

Changes in seasonal temperature patterns affect plant community composition, as they impact species ranges. We monitor plant community condition in prairies, forests, and savannas to determine how environmental change affects species abundance and community composition. We also monitor changes in populations of rare species, invasive exotic species, and sentinel species. Another type of monitoring examines the timing of key processes in plants, such as breaking dormancy.



Scientists correlated seed formation in Western prairie fringed orchid to drought and timing of fire.

#### Bird Monitoring

Changes in climate are having significant effects on breeding range, winter distribution, and timing of migration for many bird species in North America. We monitor changes in bird community composition and bird abundance to determine health of the community. We also assess integrity of habitat during breeding-bird surveys with consideration to environmental change.



Northern cardinal continues range expansion to the north.

#### Aquatic Monitoring

Storm water runoff may increase as heavy precipitation events carry soil and excess nutrients into rivers and lakes. This, coupled with warmer temperatures, could stimulate algae growth that would increase decomposition and deplete oxygen, affecting fish and other aquatic animals. We monitor water quality, fish species composition, and aquatic invertebrate community structure as indicators of stream health.



Mayfly nymphs are sensitive to changes in water quality.

#### Fire Effects Monitoring

As precipitation patterns change, the frequency and effects of wildland fire may also change. Vegetation may shift from forest to dry savanna or prairie in areas that become warm, dry, and prone to wildland fire. The rate at which these changes may occur could result in loss of rare plant and insect species from some areas without corresponding colonization of new sites. We monitor the effects of prescribed fire on our fire-dependent plant communities. We have found that drought and fire timing can affect the success of Western prairie fringed orchid seed formation. Findings like this will allow parks to manage natural resources effectively in a quickly changing environment.



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