



# Climate Change in Illinois: Freshwater

Water is one of the greatest natural resources in Illinois. The state is bordered by Lake Michigan and the Mississippi and Ohio Rivers, and the Illinois River courses through the center of the state. Important groundwater aquifers also occur throughout Illinois, providing several million residents with reliable water supplies. In most years, Illinois receives an abundance of precipitation. However, a changing climate poses challenges to Illinois' water resources. Warmer temperatures lead to more moisture in the atmosphere, more precipitation overall, and heavier precipitation events, but also a higher risk of summer drought.

## Flooding and Drought in a Changing Climate

**River flooding:** Flood events that impact key river systems, like the Mississippi and Illinois Rivers, have already increased, due to both climate change and land development, and are likely to continue increasing in frequency and severity in the future.

**Urban flooding:** Increasingly intense rainfall events associated with climate change are expected to exacerbate stresses on aging urban drainage systems, many of which are already prone to flooding.

**Water quality:** Increased urban flooding in the form of combined sewer overflows and overland flooding could cause environmental damage and public health hazards—like exposure to infectious diseases and contaminated drinking water—in urban streams and rivers and Lake Michigan.

Increased precipitation tends to increase harmful runoff into rivers, decreasing water quality. Crop management and conservation practices—including best management practices for nitrogen fertilizer application and the restoration of floodplains and wetlands—can help to reduce excess nutrient runoff and pollution.

**Water supply:** Climate change is expected to increase both the frequency of drought conditions and the magnitude of shortages in surface water supplies during drought conditions, as surface water supplies are already often limited by low streamflow unless augmented by in-channel or off-channel water storage.

**Groundwater:** Increased precipitation is expected to cause higher water tables during spring, exacerbating basement and agricultural flooding. Conversely, increased evaporation and more intense droughts in the summer are expected to lower surface water tables during peak pumping conditions. Over the long-term, persistent net reductions in groundwater recharge would potentially impact the sustainability of groundwater aquifers used for water supply.

## Pathways Forward

Efforts to mitigate flooding will be central to Illinois' response to climate change. In addition to updating outdated flood maps, it will also be necessary to improve existing drainage systems and maximize flood storage. Increasing greenspace and decreasing impervious surfaces can help to accommodate additional water in urban areas, reducing runoff and flooding. In rural areas, land use planning can identify priority areas for floodplain reconnection and restoration—an excellent way to decrease the flood risk to infrastructure and communities. On agricultural lands, which occupy around 75% of the land area in the state, farmers can implement in-field and edge-of-field practices to improve soil water retention and reduce runoff, improving resilience during floods and droughts.

### The Nature Conservancy's Contributions

#### Floodplain Prioritization Tool

The Floodplain Prioritization Tool was developed by TNC to identify the best opportunities for floodplain conservation and restoration in the Mississippi River Basin. Healthy floodplains are instrumental for reducing flood impacts, recharging aquifers, and improving water quality and wildlife habitat. The web-based tool can help decision-makers in Illinois—like government agencies, county planners, natural resource managers, and private landowners—optimize investments and prioritize areas for floodplain conservation and restoration. The Floodplain Prioritization Tool is available through the Freshwater Network's [website](#).

#### Chicago Greenprint

TNC created Chicago Greenprint to identify where nature-based solutions can alleviate challenges related to climate change in Cook County's communities. Chicago Greenprint is a mapping tool that analyzes multiple layers of data to determine which neighborhoods are at highest risk for climate change impacts, including flooding, poor air quality, and excessive heat. It considers data on which areas are home to high concentrations of youth, older adults, and low to moderate income families, who are particularly vulnerable to these impacts. The tool can be used by communities and other stakeholders to understand the risks they face and to identify areas that could benefit from green infrastructure, such as rain gardens, bioswales, and additional greenspace. To learn more about Chicago Greenprint, visit our [storymap](#).



#### Edge of Field Roadmap

In-field soil health and nutrient management practices alone are not enough to protect freshwater resources, especially in a wetter climate with increased runoff from fields. In collaboration with partners, TNC recently launched an Edge of Field (EoF) Roadmap, which provides a blueprint to scale up edge of field practices as part of a whole-systems approach to conservation in agriculture. EoF practices, such as constructed wetlands and riparian buffers, improve the water quality and resiliency of agricultural farmlands. The EoF roadmap introduces nine recommendations that partners can take to advance adoption of EoF practices at multiple scales. The Edge of Field Roadmap is available through TNC's [website](#).

Learn more about climate change in Illinois in the report, *An Assessment of the Impacts of Climate Change in Illinois*, on our [website](#).