

WATER FACTS

St. Louis, Missouri: Identifying and Becoming More Resilient to Impacts of Climate Change






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Cities across the United States should anticipate significant water-related vulnerabilities based on current carbon emission trends because of climate change, ranging from water shortages to more intense storms and floods to sea level rise. To help cities become more resilient to the rising threats of climate change, NRDC reviewed more than 75 scientific studies and other reports to summarize the water-related vulnerabilities in 12 cities—including St. Louis. Although there may still be some uncertainty about what particular impacts threaten cities and how quickly or severely they might occur, action at the local level is the most effective method of reducing, mitigating, and preventing the negative effects of water-related climate change outlined in this fact sheet. NRDC urges cities to prepare for coming challenges relating to water resources. Fortunately, there are steps cities are already taking to become more resilient.

St. Louis generally suffers from a lack of local information on projected climate changes and impacts to water resources. However, climate information for the Upper Mississippi River Basin and the Midwest region of the country suggests St. Louis will face vulnerabilities such as more frequent and intense storms and flooding, like the kind seen this summer.

Summary of water-related climate changes and impacts in St. Louis throughout the 21st century

	More frequent and intense storm events
	Increased annual precipitation
	Increased flooding

 Highly likely  Likely  Possible

Source: NRDC



For more information, please contact:

Michelle Mehta
mmehta@nrdc.org
(310) 434 2300
 switchboard.nrdc.org/
 blogs/mmehta

www.nrdc.org/policy
www.facebook.com/nrdc.org
www.twitter.com/nrdc

PRECIPITATION AND STORM EVENTS

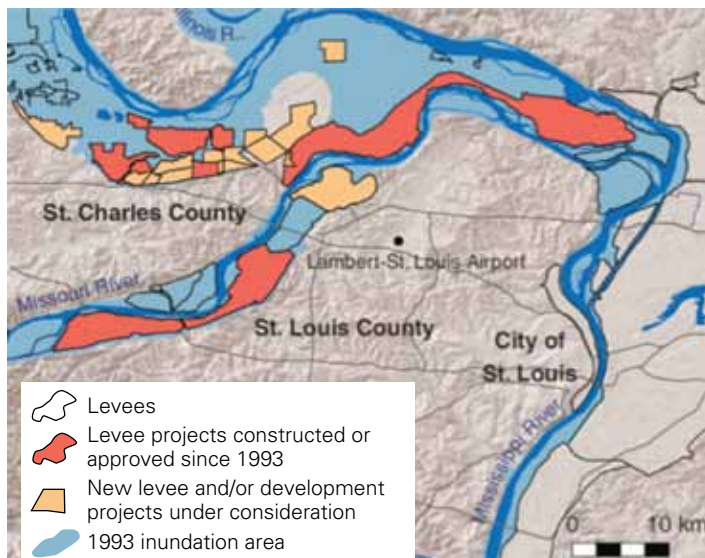
Since the middle of the 20th century, overall precipitation has already increased 10 to 20 percent in the Midwest region. In the future, precipitation is expected to continue to increase, especially in winter and spring. Summertime precipitation may stay the same or decrease. More intense storms in the region are very likely over the coming decades.

INCREASED STREAMFLOWS AND FLOODING

Increased precipitation could increase streamflows by 51 percent, due to more rain falling on near-saturated soils. The risk of floods has already increased over the past few decades along the Mississippi River near St. Louis due to increased flows, which tend to last a month or longer. Record rainfall in the Mississippi River watershed in April and May 2011, combined with springtime snowmelt, created deadly flooding throughout the Midwest. Because of heavy flow continuing to come down the river as of June 2011, the river is projected to be near flood stage all summer—the “new normal,” in the words of a National Weather Service spokesman.

Increased flooding puts floodplain development at risk of damage and inundation. After the deadly 1993 flood, St. Louis fortified its levee system. With these new and improved levees in place, people generally seem to have become less concerned about a recurrence of the devastation and have increased development in the floodplains behind the levees—at least \$2.2 billion worth in the St. Louis area alone.

Floodplain development in the St. Louis region



Source: Pinter N, One Step Forward, Two Steps Back on U.S. Floodplains, Science 308(5719):207-208 (2005).

Such development appears tied to floodplain laws in Missouri that have been criticized as some of the weakest in the nation, and it runs contrary to formal reviews of flood control policy that concluded that the best strategy for reducing flood losses is to limit or reduce infrastructure on floodplains.

INCREASED TEMPERATURE

Temperatures are expected to be warmer throughout the year in the Upper Mississippi River Basin as climate models predict a 36 percent increase in heat waves for St. Louis, from 1.4 to 1.9 per year. As winter temperatures are expected to rise, warmer late-winter and spring temperatures means that snowmelt will occur earlier in the year, contributing to early runoff into streams. Predictions for summer precipitation are less certain, but if summer rainfall decreases while temperatures increase, increased evapotranspiration rates and longer periods between rainfalls could contribute to drought and declining water levels in rivers, streams, and wetlands. According to a report by the U.S. Climate Change Science Program, “Reduced summer water levels are also likely to reduce the recharge of groundwater, cause small streams to dry up (reducing native fish populations), and reduce the area of wetlands in the Midwest.”

ACTION

In terms of taking action to reduce emissions that contribute to climate change, and prepare for its effects, the city of St. Louis and the state of Missouri generally lag behind the other cities and states featured in this report. However, in recent years, St. Louis has made considerable progress in mandating green building practices for municipal construction by adopting two ordinances that address environmental sustainability and energy consumption. Further, although climate change may not have been a motivating factor, the city recently initiated a pilot study on the use of permeable pavements as a stormwater best management practice. Nevertheless, a lack of city-specific information on climate change vulnerability should prompt St. Louis to examine its situation more closely, particularly with regard to potential flooding and water supply issues.