

Climate Change and Changes in Precipitation

Temperature and precipitation are two of the most visible indicators of the climate of a region. As the climate changes, researchers expect to see changes in precipitation patterns over the Chicago region. For example, the frequency of heavy rainfall

precipitation: rain, snow, hail, and sleet

events is changing. Also, the proportion of precipitation that falls as rain instead of snow is changing (Figure 1). The following precipitation-related changes have already been noticed in the Chicago area:

• The frequency of heavy rainfall events has doubled since the 1970s. Also, the time of year when precipitation falls most heavily is changing.

• More precipitation is falling as rain instead of snow. There is less snow in winter, and the snow melts earlier in the spring.

Changes in Precipitation Patterns

Over the coming decades, researchers expect the following changes in precipitation patterns:

More precipitation overall per year: Annual precipitation could increase by about 20% over the coming century. Most of this increase would occur in winter and spring, with little change in summer and fall, as shown in Figure 2. Little change in summer rain, together with increased evaporation due to warmer

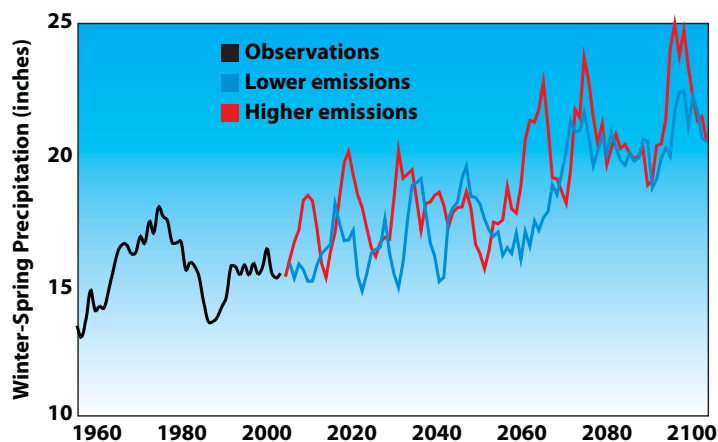


Figure 2 Increases in winter and spring precipitation.



Figure 1 The number of heavy rainfalls are projected to increase over the coming century.

temperatures, increases the risk of summer drought.

Impacts of this change: More rain and snow in winter and spring could mean an increase in flood risk for many areas. Floods cause damage to homes, buildings, roads, and bridges and may delay crop planting for farmers. In an agricultural area that relies primarily on rainfall to supply water to its fields, drier summers may mean that farmers would use more water from wells and springs to water their crops.

More heavy rain storms with dry periods in between: Heavy precipitations events—e.g., heavy rain and snow storms—may increase considerably, thus increasing the risk of flooding and stormwater contamination. (See Figure 3, other side.) Precipitation patterns are also likely to change in the summer, as rain falls more heavily but at fewer times with long dry periods in between the downpours.

Impacts of this change: Heavy rainstorms increase the risk of flooding, which can damage crops and cause soil erosion, contaminate the

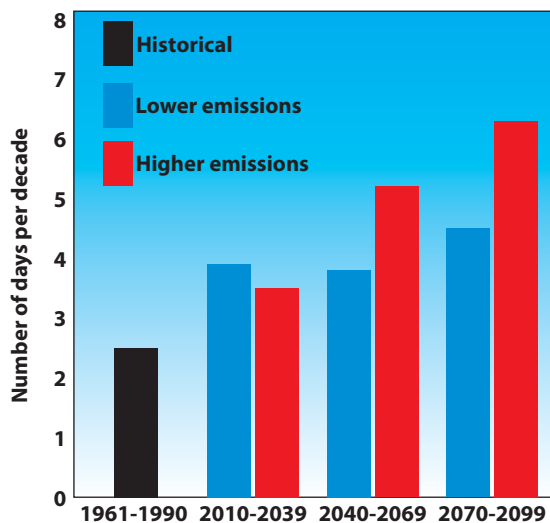


Figure 3 Increases in the number of days per decade with heavy precipitation, defined as more than 2.5 inches per day.

water supply, promote infectious disease, disrupt transportation, and lead to property damage or loss. In the Chicago region, extremely heavy precipitation events can lead to the pollution of water bodies such as the Chicago River and Lake Michigan by contaminated stormwater.

Dry periods cause serious problems, such as water shortage, reduced crop yields, increased livestock deaths, increased stress to plants and animals, greater risk of wildfires, and higher risk of water-borne diseases.

Similar snowfall amounts but less snow cover during winter:

On average, Chicago receives 38 inches of snow each winter. As winter temperatures increase, more winter precipitation is likely to fall as rain instead of snow. However, because winter precipitation is projected to increase overall, the total amount of

“There will likely be more heavy rain and snow storms. These could result in increased flooding and pollution of water bodies.”

snowfall isn’t expected to change much under lower emissions. Under higher emissions, average winter snowfall could be reduced by about 10 inches by the end of the century. Because of warmer temperatures, however, the snow that does fall is likely to melt faster when it reaches the ground. The number of days with snow on the ground is projected to decrease from an annual average of 40 days to between 13 and 23 days per year.

Impacts of this change: Since snow causes traffic problems and requires road clearance, fewer days with snow on the ground could have a positive effect on Chicago’s infrastructure. However, fewer snow days would affect winter activities in the Chicago area. Also, faster snow melts could exacerbate flooding.



Figure 4 Faster snow melts exacerbate flooding.



Climate Change and Chicago: Projections and Potential Impacts

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