

# Climate Changes and Impacts in Columbus, Ohio

## Rising Temperatures



### Average Temperature

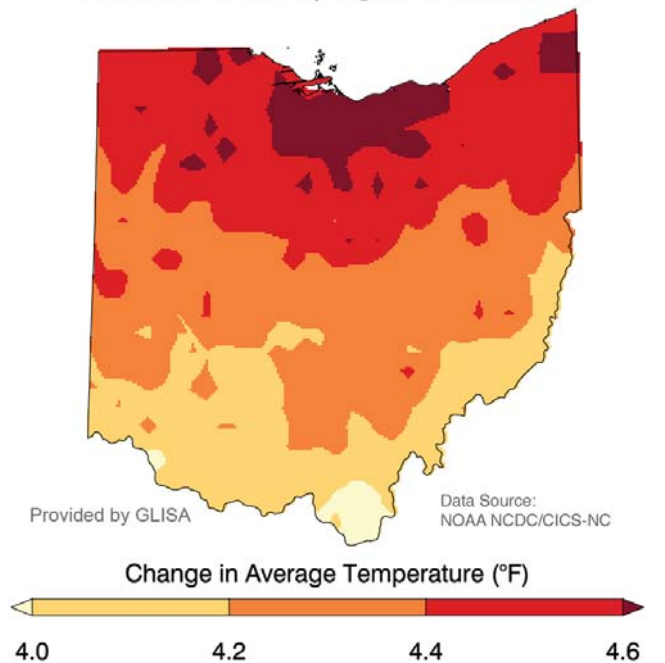
Average temperatures warmed by 2.3°F from 1951 through 2012, faster than the national and global rates. Models project this trend will continue with temperatures rising approximately 3-5°F by mid-century.



### Growing Season

The length of the freeze-free season (growing season) increased by 25.5 days from 1951 through 2012, and is expected to lengthen by an additional 1-2 months throughout the coming century.

## Projected Change in Average Temperature Period: 2041-2070 | Higher Emissions: A2



## What Rising Temperatures Mean for Columbus:



**Dangerously Hot Days:** Rising temperatures increase the risk of extremely hot days. By mid-century, Columbus could see an additional 3 to 7 weeks per year of high temperatures exceeding 90°F, and an additional 1 to 2 weeks exceeding 95°F.

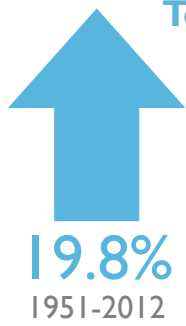
**Air Quality:** Air quality deteriorates with warmer temperatures, increasing the risk of serious public health consequences. A greater incidence of asthma attacks and other respiratory conditions is anticipated.



**Agriculture:** Through mid-century, some crop types may flourish in a warmer climate. Beyond mid-century, those benefits will likely be negated by heat stress, more frequent droughts, and a greater risk from pests.

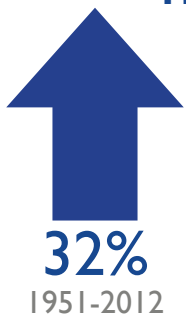
**Natural Resources:** Rising temperatures will alter the habitats of fish and wildlife, forcing plants and animals to migrate or adapt. Those unable to migrate with the pace of climate change will lose their advantage over other species, reducing ecosystem diversity.

## Increasing Precipitation



### Total Precipitation

Total precipitation increased by 19.8% from 1951 through 2012, similar to changes observed in other major Ohio cities. Fall precipitation increased dramatically, by 43.5% (3.2 inches).

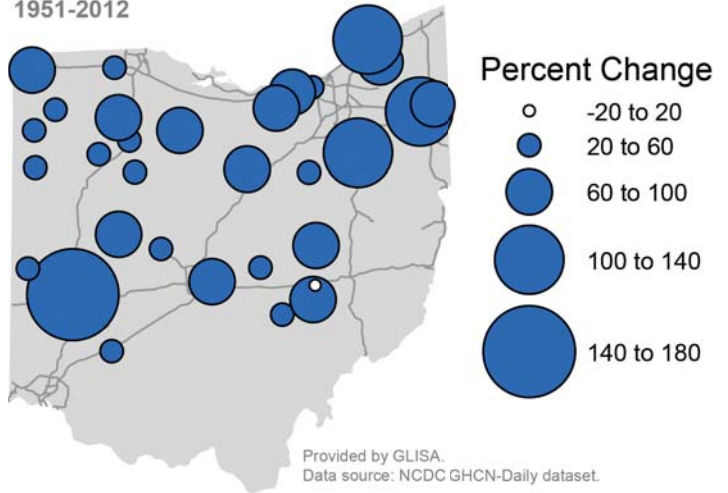


### Heavy Precipitation

Between the 1951-1980 and 1981-2010 periods, the number of very heavy precipitation events increased by 32%.

The number of days per year that saw more than 1.25" of precipitation increased by 130% from 1951-2012.

Percent Change in the Number of Days Exceeding 1.25" of Precipitation per Year 1951-2012



Provided by GLISA. Data source: NCDC GHCN-Daily dataset.

Nuisance flooding and other impacts begin to occur more frequently with daily precipitation totals over 1.25 inches.

Shown above is the percent change in the number of days per year exceeding 1.25" of precipitation recorded at high-quality weather observation stations from 1951-2012. All but two stations have observed a change greater than 20%. Long-term, contiguous climate records are limited in much of southern Ohio.

## What Increasing Precipitation Means for Columbus:

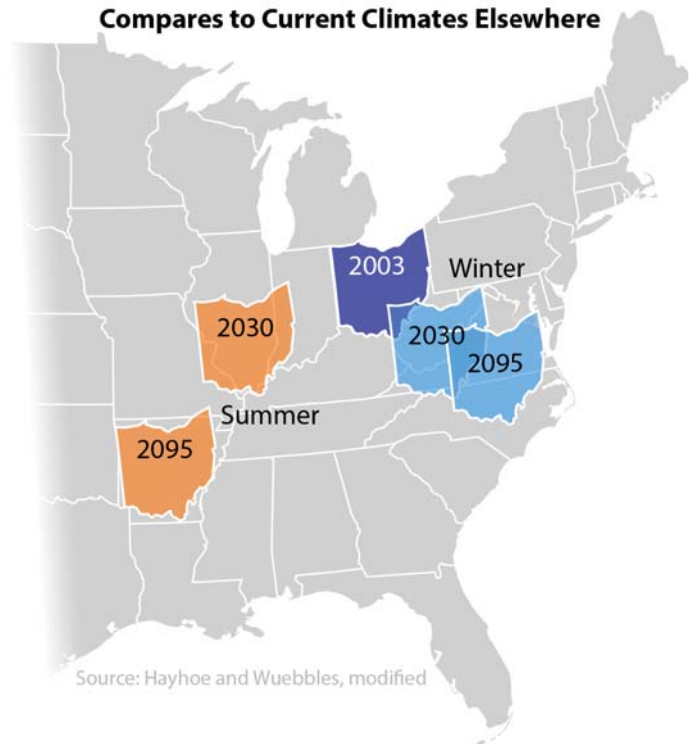
**Greater Flood Risk:** Ohio has seen large increases in heavy storms that can lead to flooding. Models project those trends will continue, increasing flood damage risks to infrastructure and public health.

**Changing Seasonal Precipitation:** As temperatures warm and precipitation increases, the form and timing of precipitation will likely change. The number of days dry enough to plant crops in the spring may be reduced, and the potential for rain on semi-frozen ground may increase.

**Reduced Water Quality:** With stronger storms come flashier flows, more runoff, and greater chances of sewer overflows that can contaminate water supplies.

**Summer Water Availability:** Many models project summer precipitation will decline even as precipitation increases during other seasons. This raises the potential for summer droughts and seasonal water shortages, particularly for agricultural and industrial use.

How the Future Climate of Ohio Compares to Current Climates Elsewhere



Source: Hayhoe and Wuebbles, modified

Based on temperature, humidity, and precipitation, future summers in Ohio might resemble those in Arkansas, and winters may become similar to those in Virginia.