

What Shapes Fall Leaf Colours?

What climate data can tell us about leaf health and fall colours in Canada's National Capital Region



Fall colours are a part of the NCR's identity



The region's "Fall Rhapsody" attracts visitors from across the globe



Climate change may impact the timing and vibrancy of fall colours

1 Why do leaves change colour?



Leaves do not simply "die" – trees instead recycle nutrients in a process called **senescence**



As the green chlorophyll break down, existing yellow and orange **carotenoids** become visible



Some trees also produce red pigments called **anthocyanins** in the fall



The timing and intensity of colour change vary by species and region

2 What can enhance vibrancy?



Cool fall nights (but not freezing) support vibrant colours



Warm fall days help create good conditions for seasonal colour change



Healthy moisture balance throughout the growing season will support healthier leaves



Sunny days help generate anthocyanins (bright red colours)



Leaf colour is determined by many factors, not simply temperature

3 What can reduce vibrancy?



Extreme heat can stress trees and lead to browning or shrivelling



An early frost can damage leaf cells and cause early leaf drop



Drought during growing season can stress leaves before fall



Extreme weather and high wind can damage trees and cause early leaf drop



Cloudy fall weather can also lead to reduced leaf vibrancy



Climate change can impact all of these factors at once

4 Climate data for the NCR

Projected changes under SSP2-4.5, 2041-2070 relative to 1971-2000

Warmer fall nights

Average fall minimum temperature

+3.0°C

Warmer fall days

Average fall maximum temperature

+3.1°C

More hot days

Days above 30 °C each year

+23 days

Hotter extremes
Annual hottest day

+3.2°C

Fewer frost days

Days per year with freezing temperatures

-28 days

Wetter falls
Total seasonal precipitation

+25 mm



Together, these changes suggest warmer fall conditions with overall less frost and greater heat stress. These indicators can help explain changing conditions for fall foliage, but they cannot predict exact peak colour dates or vibrancy.

Visit ClimateData.ca to browse, download, and visualize more climate data for your community