

## *Summary*

# FUTURE EXTREME HEAT IN THE DENVER METRO AREA



The City and County of Denver's Climate Adaptation Plan identified an increase in temperatures as one of the top three impacts Denver residents may face from climate change. This report to Denver Environmental Health identifies how much more extreme heat the metro area could experience.

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# Extreme Heat in the Denver Metro Area

Climate change could lead to much more extreme heat in the Denver metro area. If global emissions continue increasing at a high rate (illustrated by the red columns below) the median projections from 20 climate models are for an average of seven 100°-plus days in mid-century (2040–2059) and an average of 34 late in the century (2080–2099).

With emission reductions, there would be fewer very hot days. If emissions are reduced to very low levels (the green columns), 100°-plus days may be no more frequent than in recent years.

## Days 100° or hotter in typical years Projected averages for 20-year periods

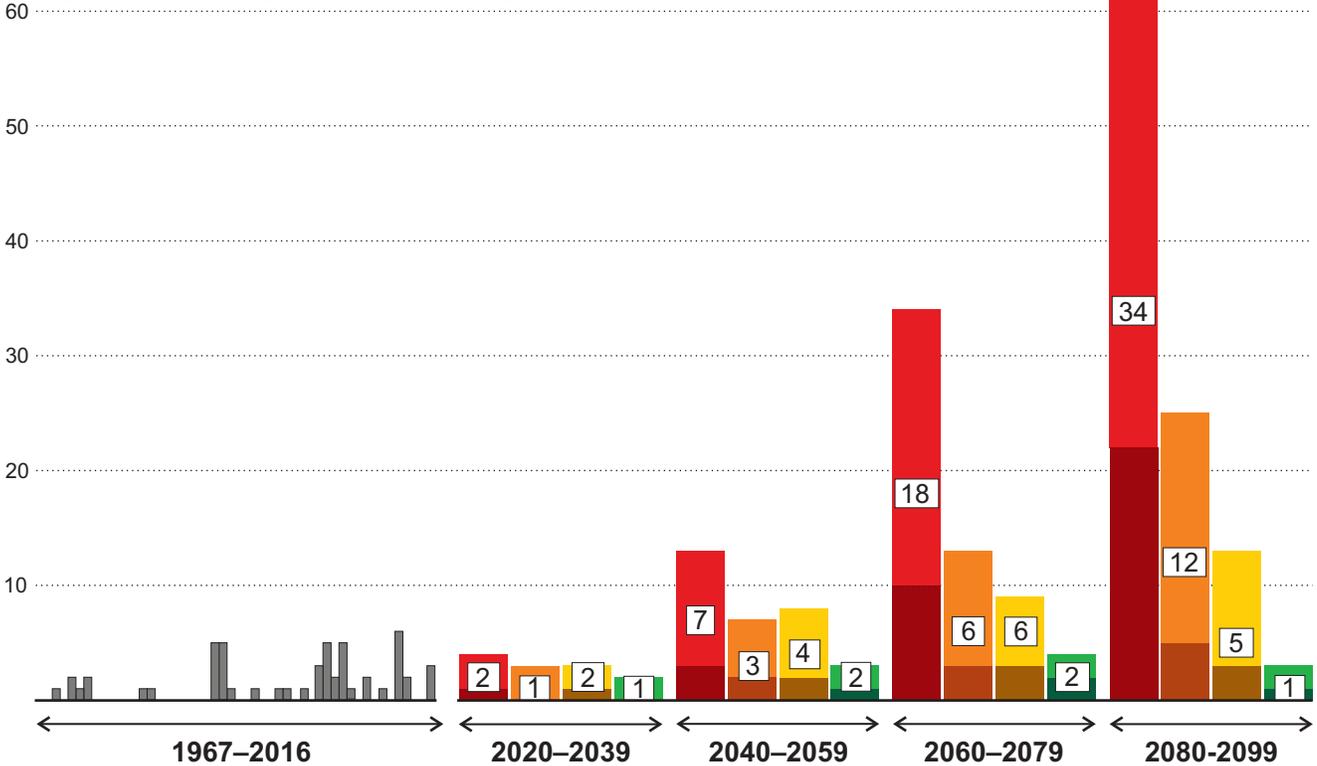
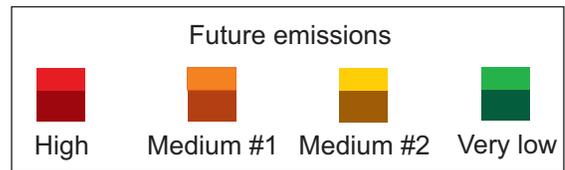


Figure 1. Days per year with high temperatures 100° or hotter. On the left, actual numbers for the past 50 years. On the right, projections for four 20-year periods, separately for different scenarios of future levels of global heat-trapping emissions. Shown are the medians and ranges of the projections; see below.



## How the figures represent multiple projections

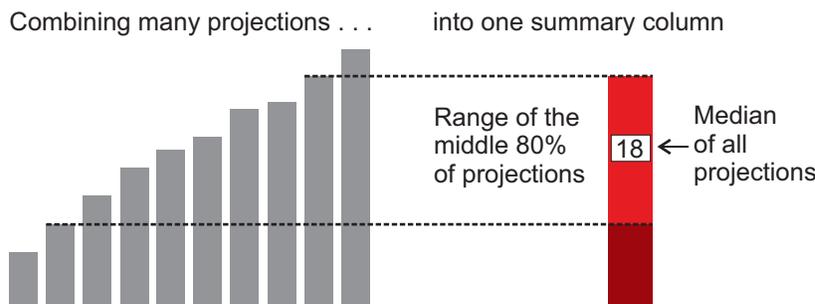


Figure 2. Illustration of how figures 1 and 3 represent multiple projections in a single column. In this hypothetical example, 10 individual projections (not the actual 20) are combined into one column. In it, the numeral is the median (or mid-point) of all projections and the brighter color shows the range of the middle 80 percent of the projections.

## Days 100° or hotter in *extreme years* Projections for the hottest year in each 20-year period

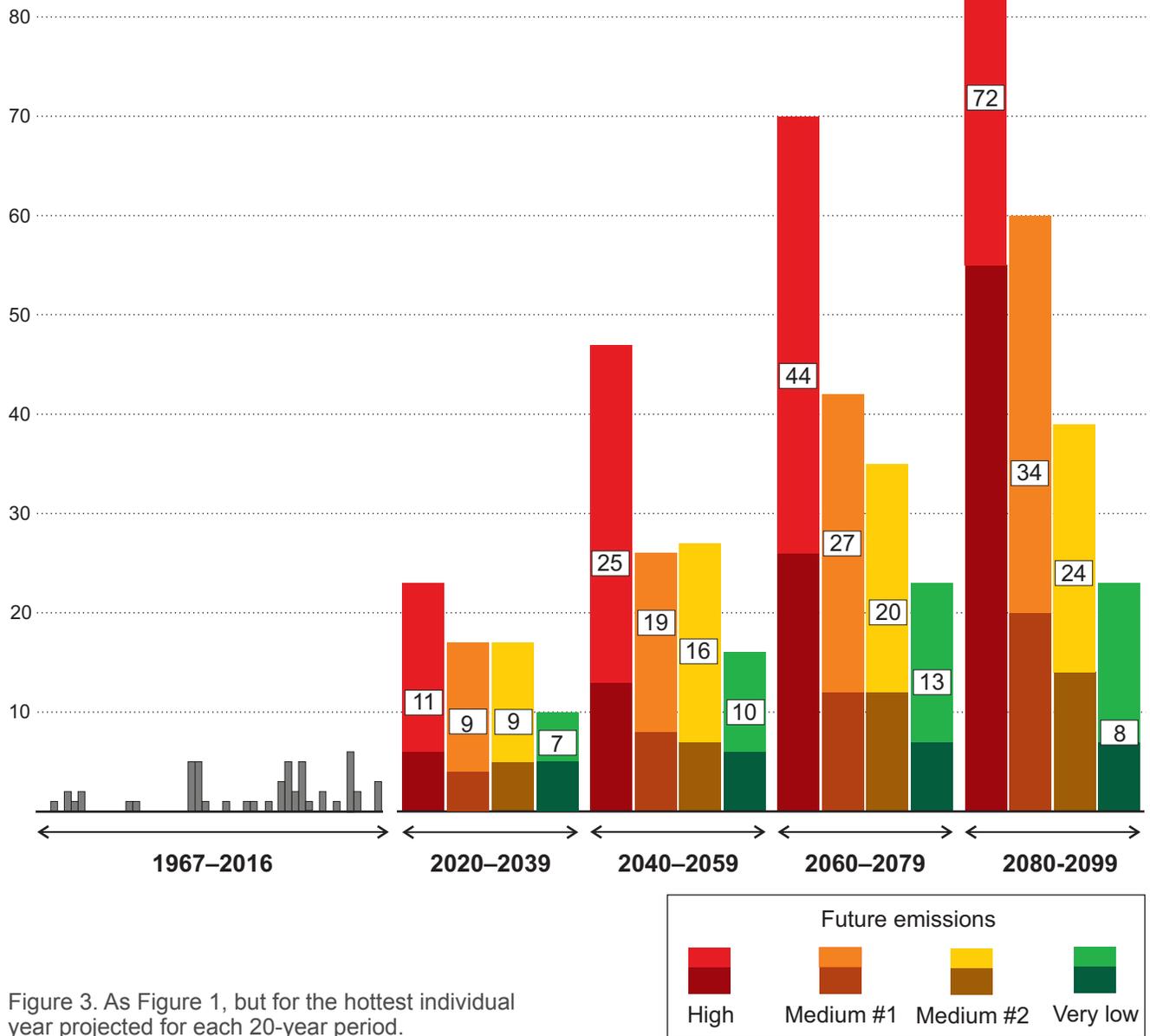


Figure 1 on the previous page shows projections for *typical* years—in other words, the average annual frequency, as projected for each of four 20-year periods. Figure 3 above shows instead projections for *extreme* years—the hottest individual year in each of those 20-year periods.

With high future emissions, the median projection is that the extreme year in mid-century would have 25 100°-plus days. Late in the century, the median projection is for 72 of those days in the hottest year in that period.

If instead future emissions are reduced, the hottest years would be this hot. Again, reducing global emissions to very low levels—represented by the green columns in the figures—would do the most to prevent major increases in extreme heat.

Detailed projections like those presented here have not been done elsewhere, so the projections for the Denver metro area cannot be compared to similar projections for other locations. But the projections for the Denver area's future can be compared to historic conditions elsewhere. This helps to bring home how different the Denver area's future climate would be if the projected increases with high emissions were to materialize.

Comparing Denver's projected average daily high temperatures in July with actual records for other locations in the recent past:

- With high emissions, the median projection is that Denver high temperatures in July in mid-century would average 94°. That would be 2° hotter than El Paso's average July highs in 1970–1999.
- Again with high emissions, Denver's July high temperatures late in the century could be 99°—approaching Tucson's recent July average high temperature of 100.5°.

Another comparison with Tucson: With high emissions, the median projection is that Denver's hottest year late in the century could have 38 *consecutive* 100°-plus days. That would be just short of Tucson's current record of 39 consecutive 100°-plus days.

**With continued high emissions, Denver late in the century could experience extreme heat about like that of Tucson in recent years.**

The projected increases in extreme heat in the Denver area shows what people here have at stake in the decisions to be made about whether to let heat-trapping emissions continue increasing or to reduce them enough to head off the worst possible impacts of climate change.

The projections also underscore the importance of preparedness actions to assess and address the possible impacts. Heat waves can cause misery and mortality, especially in areas like Denver where many homes are not air conditioned. Other impacts could include increased energy costs for cooling buildings, loss of outdoor recreation when temperatures exceed what people can tolerate, increased water demands for irrigating crops and lawns, and loss of urban trees and landscape plantings that cannot survive in extreme heat.

Preparedness actions, though, can reduce these risks. And actions taken now can both address the short-term risks that already loom and lay the foundation to tackle the greater long-term risks that could materialize.

Read the full report at  
[rockymountainclimate.org/extremes/denver](http://rockymountainclimate.org/extremes/denver).



Denver's Department of Environmental Health is dedicated to advancing Denver's environmental and public health goals. DEH works collaboratively with city, state, and community partners to conduct education, community engagement, and enforcement to ensure healthy people, healthy pets, and a sustainable environment. Our mission is to create a city with a world class environment and healthy communities for all ages and incomes, and where the well-being of our pets also matters. Through the Climate Action Plan, Denver Energy Challenge, and other programs, DEH works with partners to conserve energy, reduce greenhouse gasses, and promote sustainability.