

CLIMATE RISK AND VULNERABILITY ASSESSMENT (CRVA) - CARMEL, IN

What is a CRVA and its importance?

It is a comprehensive process that evaluates a community's vulnerability to climate change across five systems: Natural, Economic, Built, Social, and Cultural. Recognizing that resilient communities are more adept at recovering from disruptions and disturbances, this process helps us gain insight into the specific vulnerabilities Carmel has experienced in the past (trends) and may potentially encounter in the future (projections). This, in turn, enables us to enhance our preparedness measures and protect the well-being of our residents.

Why was this step taken?

The Department of Community Services (DOCS), in partnership with Indiana University's Environmental Resilience Institute, has taken this initiative in alignment with the recommendations and resources outlined in the [Climate Ready Communities](#) guidebook. The primary objective is to strengthen Carmel's climate resilience while actively supporting the City's Climate Action Plan, particularly its first strategic pillar, which focuses on public education and raising awareness regarding climate issues.

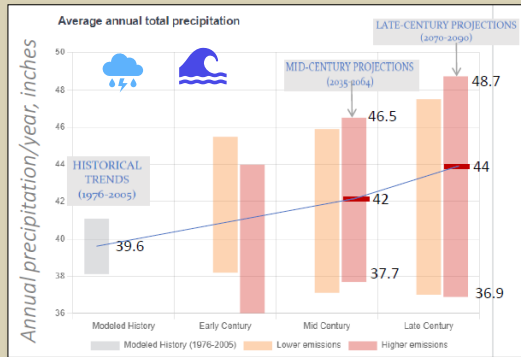
Climate vulnerabilities identified for Carmel

How was the information gathered?

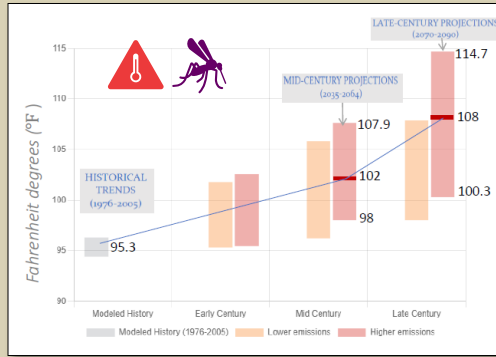
We looked at two different climate models ([CMRA](#) and [Climate Toolbox](#)). We checked them under two different climate scenarios (RCP 4.5 and RCP 8.5). These models used a specific method called Constructed Analogs and were adjusted to Carmel locally conditions. We examined the average values for 30-year periods during three different times: in the past (1976-2005), in the middle of this century (2040-2069), and towards the end of this century (2070-2099).

Some of the Key findings:

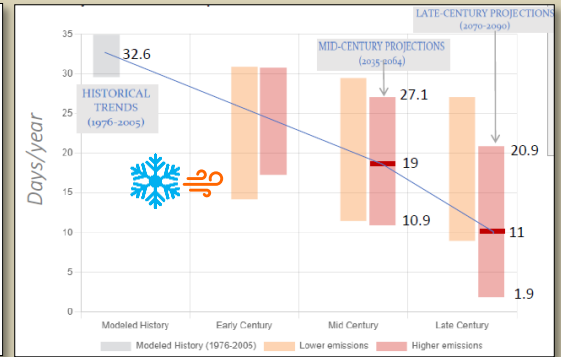
Carmel impacts summary



Carmel historically had an annual precipitation of 39.6 inches, with declining regional snowfall. Projections suggest a 5.3% to 23% increase in precipitation levels increasing the risk of frequent flooding as temperatures rise.



In recent years, Carmel has witnessed a noticeable increase in temperatures, with the annual high reaching 97.3°F. This upward trend is anticipated to persist, potentially resulting in 15-102 more days per year with temperatures exceeding 95°F. These rising temperatures are affecting all seasons, marking a significant departure from historical climate data



Winters are becoming milder, resulting in fewer days with freezing temperatures and reducing snowfall. This also extends to springs and falls, making them warmer, and summers hotter. Projections indicate a 66.6% decrease in below-freezing days by late-century. This shift facilitate the spread of diseases carried by vectors such as mosquitoes and ticks, posing threats to both human health and food security.

Required efforts to conduct CRVA

Key steps within the process was gaining insights from community members through a comprehensive community-wide survey and develop a collaborative [stakeholder workshop](#) that included participants from the five key systems mentioned above

- Quick overview of [Risk matrix](#)
- Quick overview of [the most prominent vulnerabilities](#)
- Quick overview of [community-wide survey results](#)

It was conducted on July 19th, from 9:00am to 5:00pm, and you can find the detailed report [clicking here](#).

