

Continued 21st century warming in response to rising global greenhouse gas emissions brings with it the risk of increasingly frequent extreme heat events, including those for which the heat index—a combination of temperature and relative humidity also known as the “feels like” temperature—is high enough to pose threats to human health and lives. Using a suite of statistically downscaled climate model output, we developed national-scale projections of the future frequency of days with heat indices above 90°F, 100°F, or 105°F for midcentury (2036-2065) and late century (2070-2099) under a higher emissions scenario (RCP8.5), a lower emissions scenario (RCP4.5), and a scenario in which future global average warming is limited to 3.6°F above preindustrial levels. In Seattle, the multi-model average number of days with a heat index above 90°F is projected to increase from a 1971-2000 baseline average of zero days per year to six days per year with RCP4.5 and nine days per year with RCP8.5 by midcentury. In Portland, the number of above 90°F days per year increases from four historically to between 17 and 23 by midcentury, depending on the scenario. By late century, Seattle and Portland are projected to experience an average of 30 and 53 such days per year, respectively, with the RCP8.5 scenario. By limiting future warming to 3.6°F, such days would be reduced by 80% in Seattle and by 67% in Portland compared to late century projections with RCP8.5. While the number of days with a heat index above 100°F remains relatively low even in late century for the Northwest region, southeastern Washington and parts of Idaho are projected to experience an average of 30 or more days with a heat index above 100°F by late century with RCP8.5. Assuming no population change and the RCP8.5 scenario, more than 10 million Northwest residents would face an average of seven or more days per year with a heat index above 90°F by midcentury compared to zero historically. Given the lower prevalence of air-conditioning in the region and the population’s lack of acclimatization to extreme heat conditions, these changes could pose severe risks to Northwest residents.