Climate Risk Assessment Brief

Louisville, Kentucky

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Summary

Climate change is expected to increase the intensity of rainfall and the frequency of dry spells in Jefferson County, Kentucky. Without proper adaptive measures, odor issues related to the region's sewer system are expected to worsen due to heat and precipitation changes.

Climate change is expected to both intensify precipitation events and increase the number of dry periods with little to no rainfall. By 2050, the 100-year 24-hour rainfall event is projected to increase 24%, from a current baseline of 7.8 inches to 9.6 inches.

Louisville's sewer system can emit odors when there isn't enough rainfall to flush out the buildup of organic matter in catch basins. An odor event is most likely to occur when there are 5 or more consecutive days with less than 0.5 inches of rain and a daily high temperature of 64°F or above. However, historical odor complaints are more strongly influenced by a lack of precipitation than by the maximum daily temperature. Currently, parts of western Jefferson County experience over 140 odor days per year on average. Without upgrades to the sewer system, Jefferson County could see more than 2 weeks of additional odor complaint days by 2070 due to changing climate conditions.

Adaptation strategies focused on odor control will be necessary to address the effects of more extreme precipitation and prolonged dry spells on public health and quality of life.

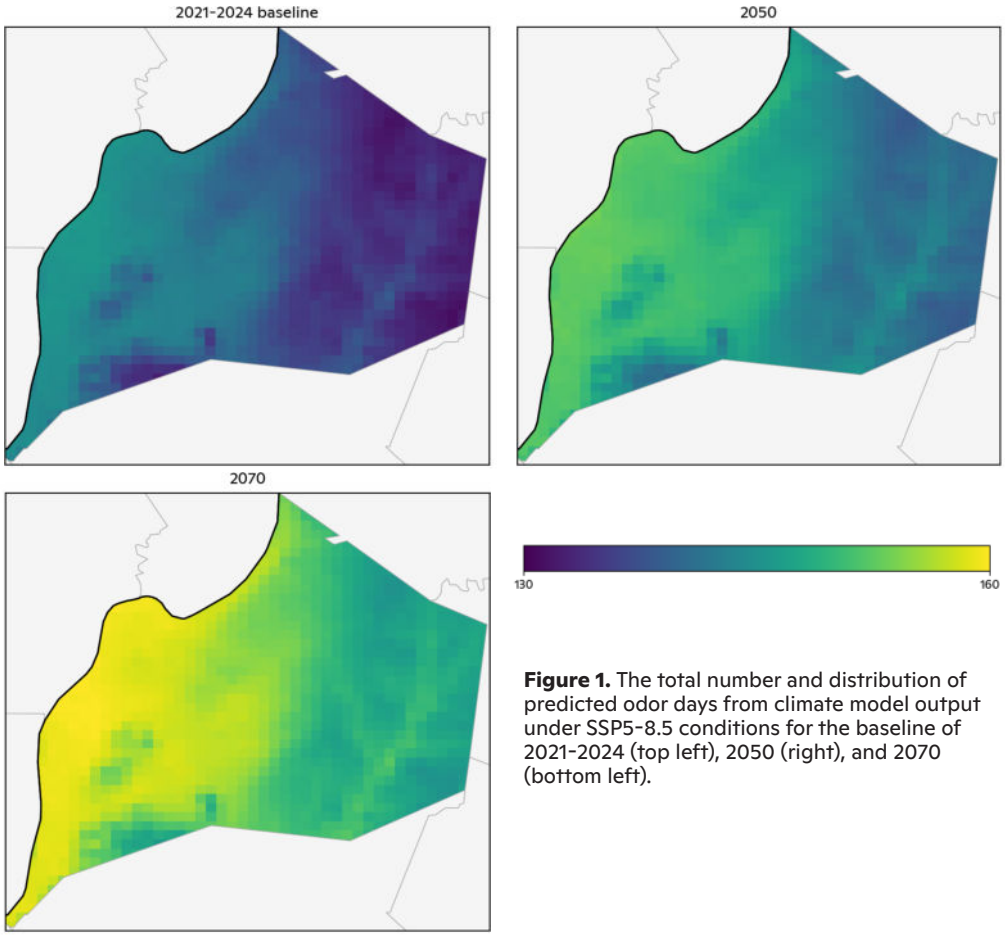

Figure 1. The total number and distribution of predicted odor days from climate model output under SSP5-8.5 conditions for the baseline of 2021-2024 (top left), 2050 (right), and 2070 (bottom left).

Woodwell Climate Research Center

Woodwell Climate conducts science for solutions at the nexus of climate, people and nature. We partner with leaders and communities for just, meaningful impact to address the climate crisis. Our scientists helped to launch the United Nations Framework Convention on Climate Change in 1992, and in 2007, Woodwell Climate scientists shared the Nobel Prize awarded to the Intergovernmental Panel on Climate Change. For 40 years, Woodwell Climate has combined hands-on experience and policy impact to identify and support societal-scale solutions that can be put into immediate action. This includes working with municipalities on the frontlines of the climate crisis.

For more information about this analysis, or Woodwell Climate's other climate risk assessments, please contact us at: policy@woodwellclimate.org

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Woodwell's Climate Risk Assessments

The way that Earth's natural systems respond to a rapidly warming climate will impact our quality of life for generations to come. Communities to countries worldwide must be armed with the most up-to-date science so that planning, zoning, and adaptation decisions can be made in the near term to protect against future climate-driven risks. Understanding the scale and nature of climate risks can also be an important motivator of mitigation action.

Combining technical expertise with local knowledge creates the most complete climate risk profile—one that is intentionally created to actually be used by local decision makers. Woodwell has already cultivated municipal partnerships with cities and towns throughout the world that have long-term sustainability goals, providing them with the science they need to make climate-smart decisions.

Communities for which Woodwell Climate has completed or is preparing municipal risk assessments.

We have expertise studying a wide range of climate hazards

Drought	Flooding	Water Scarcity	Sea Level Rise
Heat Stress	Hurricanes	Agriculture Yield	Permafrost Loss
Wildfires	Storm Surge	Precipitation	