

Canastra Region, Brazil

Summary

Woodwell Climate researchers analyzed the impacts of projected climate changes on heat danger, wildfire risk, and crop failure in the Canastra Region of Minas Gerais, Brazil.

Heat danger days—days when the temperature feels like at least 39.4°C (102.9°F)—are expected to increase from a historical average of 0–4 days to 0–39 days in 2040–2060. This poses human health risks such as an increased probability of heat stress and heat stroke, connecting the effects of climate change, which at times feel difficult to understand, to real people's lives—one of the three main goals of COP30 announced by the Brazilian Presidency.

Similarly, Fire Weather Index (FWI) data revealed that the Canastra Region could experience an 83–139% increase in wildfire risk days, translating to up to 15–25 additional risk days per year.

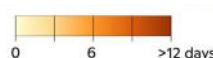
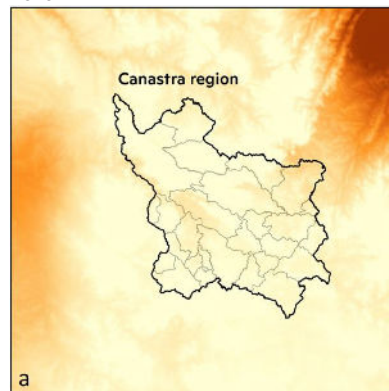
Finally, crop yield failures (declines of 10% or greater compared to average yields) are expected to worsen. Specifically, the probability of maize yield failures is expected to increase from a historical average of 11–23% chance of failure to a 29–61% chance of failure between 2041–2060. In contrast, the probability of soybean crop failure is expected to decline by about 10% except in the Northwest region, in which the probability of soybean crop failure may increase by up to 11%. Declining crop yields carry implications for economic stability and food security, making them a key concern as climate change progresses.

Relevance to COP30

- The main official outcome expected at COP30 is a set of ca. 100 indicators for global adaptation and resilience targets agreed at COP28. The indicators will cover the health and agricultural sectors, and the findings of this analysis can inform the design and future reporting on the indicators.
- The COP30 incoming Presidency has highlighted the importance of resilient health and agricultural sectors for the climate effort across several workstreams, including the COP30 Action Agenda. The findings of this study are relevant for actions towards in particular two key objectives of the Action Agenda: (9) more resilient, adaptive, and sustainable food systems and (16) promoting resilient health systems.

Select Results

Annual Average Heat Danger Days
2010



Change in Annual Average Heat Danger Days
Additional days by 2050

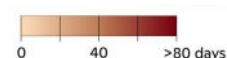
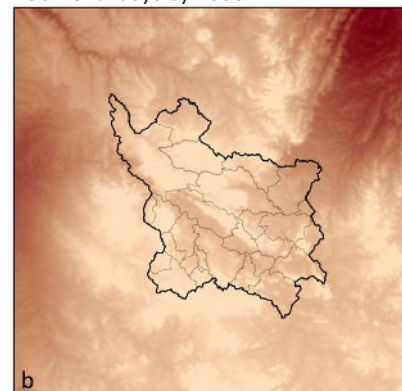


Figure 1. Heat Danger Days, Canastra Region. (a) Annual average number of heat danger days, 2000–2020. (b) The additional number of days with dangerous heat, 2040–2060.

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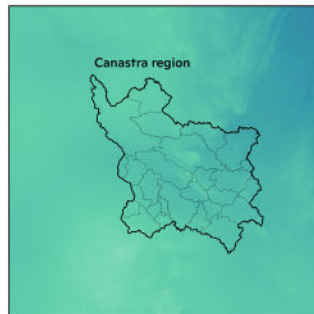
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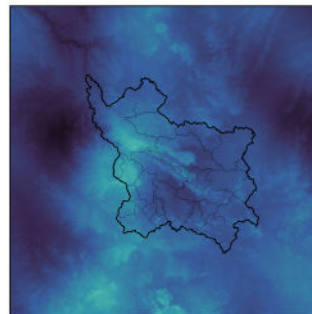
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**Probability of 10% Decline
in Maize Yield**
Historical: 1998–2017



**Probability of 10% Decline
in Maize Yield**
Future: 2041–2060



**Change in Decline
in Maize Yield**
Future: 2041–2060

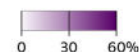
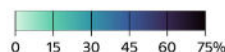
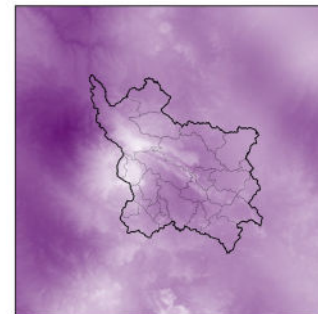


Figure 2. Maize Yield Failure, Canastra Region. (left) Probability of a 10% decline in maize yield, 1998–2017. (middle) Probability of a 10% decline in maize yield, 2041–2060. (right) Change in probability of 10% decline in maize yield, 2041–2060 minus 1998–2017.

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	



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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