

# Rio Branco, Brazil

## Summary

This summary outlines how the combined effects of deforestation and climate change will cause air pollution and adverse health effects in Rio Branco, Brazil.

Air pollution from particulate matter (PM) already causes health issues in Brazil. Deforestation and climate change are likely to increase rural fires, raising PM levels and exacerbating health problems.

The combustion of fossil fuels and biomass introduce PM into the atmosphere. PM often remains for long periods, travels long distances due to air currents, and can cause heart and lung issues if exposure exceeds the World Health Organization (WHO) guideline levels of an annual concentration of 5 µg/m. Currently, about 97.3% of the world population lives in conditions that exceed these limits, causing an average loss of 2.2 years of life expectancy per person. Because of PM's ability to travel long distances, the issue of air pollution defies national boundaries; it is a global issue that requires multilateral cooperation to reduce and resolve, and Brazil has stressed its importance for COP30.

Fire increases PM concentration, and deforestation and climate change are increasing the likelihood of fires. The Brazilian state of Acre has experienced 5.7% deforestation between 2000 and 2020. Deforestation increases fire risk by reducing dense forest area, which has the ability to hold moisture and humidity. To combat the effects of deforestation, the President of COP30, Ambassador André Corrêa do Lago, has emphasized the importance of achieving the goal to reduce and reverse deforestation and forest degradation by 2030 agreed at COP28.

A recent climate risk assessment undertaken by Woodwell experts for the city of Rio Branco in Brazil found that the annual averages of PM2.5 content in the Brazilian state of Acre exceeds WHO guidelines, translating to a 2.7 year average loss of life expectancy per person, or a total of 2.5 million years across the state of Acre. The impact of natural events on health and life expectancy shows the importance of addressing these problems and the ways in which they apply to human lives, something that the Brazilian leaders of COP30 want to emphasize.

Southern airflow has the greatest negative impact on the air quality in Rio Branco due to increased fire events south of the region. Our assessment predicts a 34% increase in annual fires in areas where smoke could reach Rio Branco within two days by 2090. This increase in fire danger is likely to increase PM content and degrade air quality further. Our estimates are conservative, meaning the continuation of unsustainable emissions and land use practices are likely to worsen air quality and fire danger predictions beyond our estimates.

## Relevance to COP30

- The main official outcome expected at COP30 is a set of 100 indicators for the global adaptation and resilience targets agreed at COP28. The indicators will cover the health sector, and the findings of this analysis can inform the design and future reporting on the indicators.
- Objective 16 of the Action Agenda announced by the incoming COP Presidency highlights focuses on building resilient healthcare systems. These will be increasingly important as increased fires further degrade air quality, and COP30 needs to find ways to advance the health agenda.
- Deforestation is a significant source of PM emissions. For COP30, the Brazilian Presidency has announced several initiatives related to forests, including the launch of the Tropical Forests Forever Fund and objective 5 of the Action Agenda (investments to halt and reverse deforestation and forest degradation). These efforts will be important for achieving the global target of reducing and reversing deforestation and forest degradation by 2030 agreed at COP28.

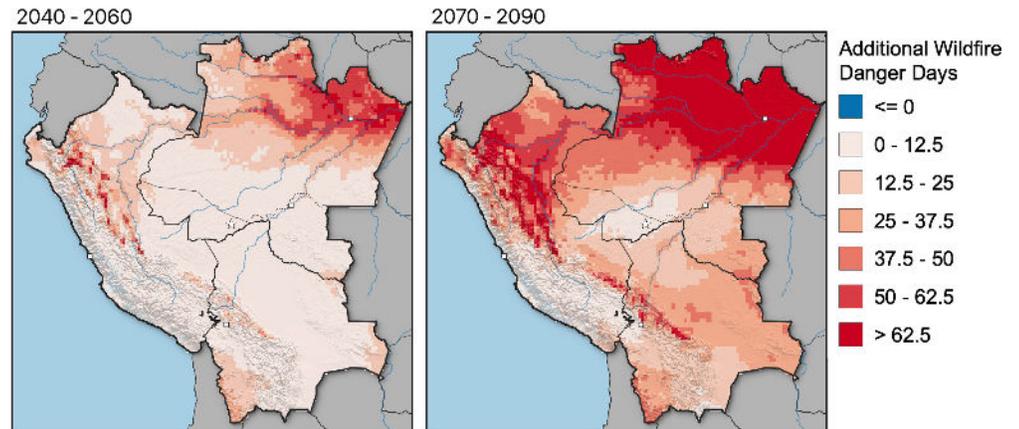
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## Select Results



**Figure 1.** The change in fire danger days per year relative to 2000-2020 in two future periods according to CMIP5 projections under the RCP85 IPCC scenario. A fire danger day is defined as a value of Fire Weather Index exceeding the 95th percentile at each location for the reference period.



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](mailto:policy@woodwellclimate.org)

## 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.

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map by Christina Shuttani