

THE CAT RESOURCE CENTER

Southern Brazil 2024 Floods

July 2024

Evolution of flood risks in Brazil

The southern Brazilian state of Rio Grande do Sul has recently been grappling with devastating floods caused by heavy rainfall. These floods have resulted in significant loss of life and widespread destruction, leaving hundreds of towns submerged and forcing thousands of people to evacuate their homes. As of July 11, there are at least 179 reported deaths, and 34 individuals are still missing. The state's civil defence agency has declared this to be the fourth environmental disaster in the last 12 months, following the floods of 2023.



Beira Rio stadium and surrounding area in Porto Alegre (AP Photo/Carlos Macedo)

The torrential rain events, which have been occurring since late April, have affected more than 2.3 million people in 475 municipalities. The severity of the floods is unprecedented, as the 2024 event exceeded the 1941 flood, with the Guaíba River rising 5.3 meters above its normal levels, compared to the recorded 4.73 meters in 1941.

Questions are now being asked by state officials regarding the cause of such extreme weather events. Are these floods merely a result of localized variations in weather patterns, or do they signify a larger trend of climate change? Understanding the underlying factors behind these floods is crucial for developing effective strategies for flood risk management.

GC Risk Scores

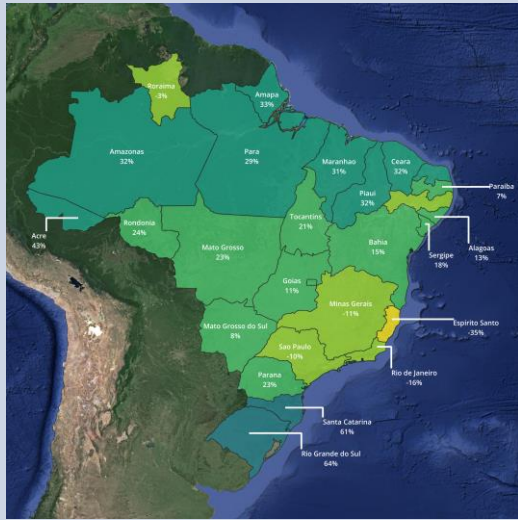
At Guy Carpenter, we have recently developed a set of products called GC Risk Ratings, which quantify flood risk at high resolution (30m) across the entire globe. This crucially includes future climate scenarios, which help to determine how the flood risk is impacted by different levels of warming.

By aggregating the future scenarios risk ratings at state resolution and comparing with the baseline scenario, we found that the states of Santa Catarina and Rio Grande do Sul are both likely to see the largest increase in flood risk in both the short term (1.5° C warming scenario compared to pre-industrial) and the long term (3° C warming scenario compared to pre-industrial) compared to the rest of Brazil.

Southern Brazil 2024 Floods

July 2024

Figure 1: Predicted change in flood risk using GC Risk Rating.



(a) 1.5°C warming scenario



(b) 3°C warming scenario

Our findings agree with precipitation projections from IPCC (Intergovernmental Panel on Climate Change), in which both total and maximum precipitation are projected to considerably increase (see Figure 2 below) in correspondence of the 2 Brazilian states.

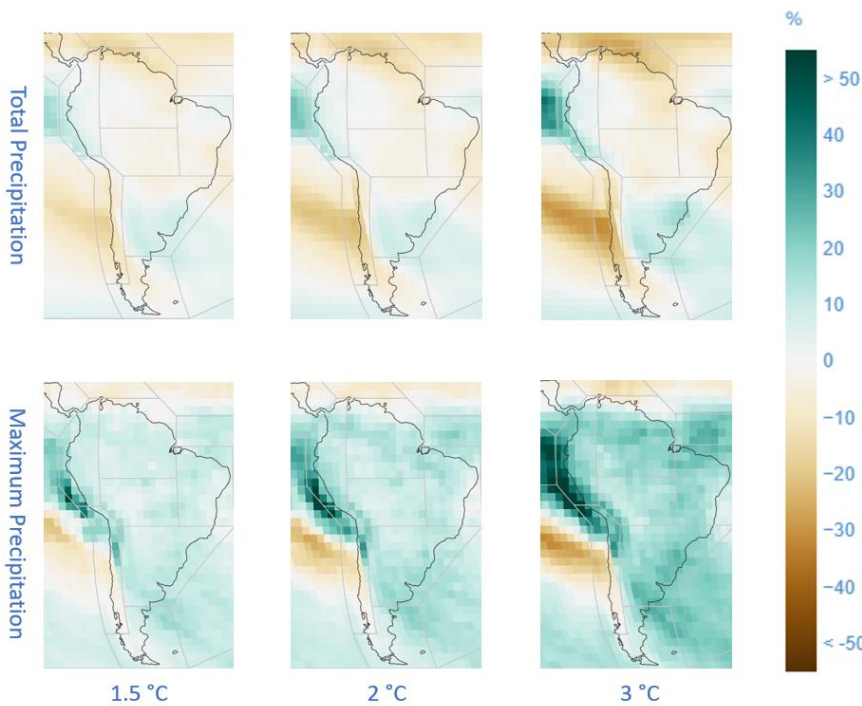


Figure 2: Predicted percentage of change in total and maximum precipitation from baseline for different warming scenarios. Green—precipitation increase; Brown—precipitation decrease. Source: Intergovernmental Panel on Climate Change

In conclusion, the GC Risk Rating products predict that the increased flood risk in the Southern States of Brazil is likely to persist and perhaps increase as global temperatures increase.

THE CAT RESOURCE CENTER

Southern Brazil 2024 Floods

July 2024

As a leading risk and reinsurance intermediary, Guy Carpenter is well-positioned to support the market in addressing extreme weather challenges. Our GC Risk Ratings offer comprehensive flood risk assessment, providing valuable insights for insurers and reinsurers. By leveraging advanced analytics and modeling capabilities, we identify high-risk areas, develop tailored risk management strategies, and design innovative insurance products.

In addition to these capabilities, we are proud to announce the launch of a pioneering probabilistic flood model in Brazil. This model revolutionizes flood risk management by providing a probabilistic approach to understanding and quantifying flood risk. With this groundbreaking initiative, Guy Carpenter continues to lead the way in addressing flood risk and supporting the resilience of the Brazilian market.

About Guy Carpenter

[Guy Carpenter & Company, LLC](#) is a leading global risk and reinsurance specialist with 3,500 professionals in over 60 offices around the world. Guy Carpenter delivers a powerful combination of broking expertise, trusted strategic advisory services and industry-leading analytics to help clients adapt to emerging opportunities and achieve profitable growth. Guy Carpenter is a business of [Marsh McLennan](#) (NYSE: MMC), the world's leading professional services firm in the areas of risk, strategy and people. The company's more than 85,000 colleagues advise clients in over 130 countries. With annual revenue of \$23 billion, Marsh McLennan helps clients navigate an increasingly dynamic and complex environment through four market-leading businesses including [Marsh](#), [Mercer](#) and [Oliver Wyman](#). For more information, visit www.guycarp.com and follow us on [LinkedIn](#) and [X](#).

Guy Carpenter & Company, LLC provides this report for general information only. The information contained herein is based on sources we believe reliable, but we do not guarantee its accuracy, and it should be understood to be general insurance/reinsurance information only. Guy Carpenter & Company, LLC makes no representations or warranties, express or implied. The information is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such. Statements concerning tax, accounting, legal or regulatory matters should be understood to be general observations based solely on our experience as reinsurance brokers and risk consultants, and may not be relied upon as tax, accounting, legal or regulatory advice, which we are not authorized to provide. All such matters should be reviewed with your own qualified advisors in these areas. Readers are cautioned not to place undue reliance on any historical, current or forward-looking statements. Guy Carpenter & Company, LLC undertakes no obligation to update or revise publicly any historical, current or forward-looking statements, whether as a result of new information, research, future events or otherwise. The trademarks and service marks contained herein are the property of their respective owners.

©2024 Guy Carpenter & Company, LLC. All rights reserved.