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Climate change played major role in UCT's April 2021 wildfire - study

Climate change was largely responsible in weather conditions that contributed to the devastating runaway wildfire that gutted large parts of the University of Cape Town's (UCT) upper campus almost two years ago. And as global temperatures soar, wildfire weather conditions as severe as those seen on that fateful day are now 90% more likely to reoccur.

This is according to a new research study titled: "The April 2021 Cape Town wildfire: has anthropogenic climate change altered the likelihood of extreme fire weather?" The study was carried out by Zhongwei Liu, a doctoral candidate at Coventry University in the United Kingdom in partnership with Stefaan Conradie, a PhD student in climatology in UCT's Climate Systems Analysis Group (CSAG) in the Department of Environmental and Geographical Science.

Climate change and wildfires
According to Conradie, researchers selected climate change attribution as their topic of choice due to increasing public interest in extreme events where weather and climate change play a leading role. The field of climate change attribution involves assessing the role that climate change plays during extreme weather and climate events such as droughts, floods and heatwaves.

Liu's study explored how these climate system changes affect the frequency at which extreme wildfire weather occurs, and researchers used Cape Town's April 2021 runaway wildfire as the focus of their study. To help them reach their conclusions they used climate model projections of hot, dry and windy weather conditions, which are known to be associated with a high fire risk.

"Wildfires are a complex natural phenomenon influenced by various physical, environmental and social factors, of which weather and climate are but a part. But weather and climate have a critical influence on when wildfires become dangerous and destructive," Conradie said.

The 'most severe' autumn
The study found that on the day of the 2021 fire, Cape Town experienced the worst autumn fire weather conditions in over 40 years. These weather conditions, Conradie added, contributed to the rapid spread of the wildfire. As researchers analysed weather patterns for

this study, Conradie said they found that the same fire weather conditions as experienced in April 2021 would "very likely" reoccur in the future. And while weather conditions are rarely responsible for starting wildfires around Cape Town, in the presence of sufficient flammable vegetation on a mountain, weather conditions determine how easily firefighters are able to control or suppress wildfires, or whether they will ravage uncontrollably.

"Devil's Peak's natural vegetation is highly flammable. And the invasive species that dominate much of the landscape and that are rapidly regrowing after the fire, tend to burn far more intensely. As has been pointed out with the volume of people moving around the mountain, ignitions are essentially inevitable," he said.

"Couple this with warming and drying weather patterns and the question is when – not if – another big wildfire will threaten the urban fringe around the mountain again. Such fires may exhibit behaviours that have not yet been observed or experienced by firefighters before – making it very challenging to contain the blaze. As the planet warms, this risk is expected to increase."

A local take

Conradie said he was selected to contribute local data for this study after Liu and her supervisors read an article that highlighted his observations of Cape Town's weather patterns before and after the 2021 fire. Because Liu's research was closely related to his, Conradie said he jumped at the opportunity to contribute to the study.

"From my exploratory analysis, it was clear that similar weather patterns influenced both the 2015–2017 Cape Town drought and the 2021 fire. I was excited to get involved in this study and to contribute local data and expertise," he said. "As scientists study complex challenges like climate change, I feel inter-disciplinary research is essential to make real progress."

A first of its kind

The study is believed to be a first of its kind that quantifies the role of climate change and the risk of extreme wildfire weather conditions in Southern Africa. Conradie said he hopes their research findings will encourage further studies that will help scientists understand the risk factors associated with a repeated April 2021 wildfire.

"This could then pave the way for evidence-based interventions to mitigate future risks and to protect students, staff, historic buildings and material from another devastating fire. I also hope it helps more people to see that climate change influences events that have a profound impact on our lives. It's not just an abstract, distant issue. Rather, it's a key emerging element of a complex range of factors that influence and risk our lives," he said.

Story by Niémah Davids, UCT News.

Read the study.

Ends

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