

Australia: Climate change and the bushfire crisis

Frank Gaglioti
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Australia is currently experiencing catastrophic bushfires throughout much of the country and bushfire smoke is enveloping towns and major cities. While the Australian countryside has always had fires that have shaped the landscape in many ways, the current fire season is qualitatively different to those in the past.

Climate scientists, who have been warning of the impact of climate change since the 1980s, are highlighting the influence of global warming that is increasing the ferocity of bushfires.

Devastating forest fires are an international phenomenon. Last year has seen major forest fires in Sweden, Portugal, Italy, California, Alaska and Siberia, as well as in Africa and South America.

The driving force to the changes in the climate is the steady increase of greenhouse gases into the environment.

According to the *State of the Climate 2018* report for Australia produced by the Bureau of Meteorology (BOM) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the concentrations of all greenhouse gases in the atmosphere have continued to increase.

Scientists estimate that the concentrations of greenhouse gases have not been so high for 800,000 years. The increases are mostly due to the burning of fossil fuels.

The steady rise in the concentration of greenhouse gases has increased global temperatures. According to the *State of the Climate 2018* report: “Globally averaged air temperature has warmed by over 1 degree Celsius since records began in 1850, and each of the last four decades has been warmer than the previous one.”

NASA’s Goddard Institute for Space Studies estimates that global temperatures in 2018 were 0.83 degrees Celsius or 1.5 degrees Fahrenheit warmer than the 1951 to 1980 mean. The past five years to 2018 have been the warmest in the modern record.

“The long-term temperature trend is far more important than the ranking of individual years, and that trend is an upward one... The 20 warmest years on record have been in the past 22 years. The degree of warming during the past four years has been exceptional, both on land and in the ocean,” Petteri Taalas, secretary general of the World Meteorological Organisation (WMO), said.

The steadily increasing temperatures are causing major shifts in the world’s climate.

University of Canberra climate scientist and lead author on the United Nations Intergovernmental Panel on Climate Change sixth assessment report Sophie Lewis assessed that the fire danger rating trend in Australia has been on the rise for half a century.

“There is something in the climatology that has changed; it’s a very clear trend,” Lewis said.

The current intense fire season points to two indicators of the shift in climate: there is no El Niño weather pattern as occurred in the severe 2009, 2003 and 1994 bushfire seasons, and this year’s season started early.

El Niño or the El Niño-Southern Oscillation (ENSO) cycle involves fluctuations in ocean and atmospheric temperatures in the east-central Equatorial Pacific that tend to bring about hotter, dryer conditions in Australia.

A study conducted by senior research scientist at the Australian Bureau of Meteorology (BOM), Chris Lucas, and the manager of research and development at the Country Fire Authority, Sarah Harris, have identified the central drivers of the Australian climate.

The two scientists examined seasonal fire weather history for 44 years at 39 different weather stations in order to reveal the long-term trends affecting fire weather. They found that while El Niño is the most important cause of extreme fire conditions, the Indian Ocean Dipole (IOD) and the Southern Annular Mode (SAM) also have a profound effect on climate.

The IOD are fluctuations in sea surface temperatures in the tropical western and eastern Indian Ocean. SAM describes the north south movement of the westerly wind belt circling Antarctica and is an important indicator of rainfall in southern Australia.

“Long-term climate change in Australia is an undeniable reality,” Lucas and Harris state.

El Niño, IOD and SAM control the natural variability in the environment and the Australian climate. The impact of global warming on these weather patterns has created the conditions for the current catastrophic bushfire disaster.

The *State of the Climate 2018* notes strong land surface temperature increases and a 10 to 20 percent decline in cool

season rainfall across southern Australia since the 1970s. These changes are closely associated with increasing human greenhouse gas emissions, as well as natural variability.

A report published by the Climate Council in November 2019 entitled *'This is Not Normal': Climate change and escalating bushfire risk* pointed out that rainfall for NSW from January to August has been the lowest on record for most of the state. Climate change has exacerbated the record dry conditions.

The increase in temperatures enhances plant transpiration leading to significantly dryer vegetation that can be set alight with the slightest spark. It has also led to the unprecedented situation where wet rainforests in NSW and Queensland have been burnt out this fire season.

"Heat is a factor too, both exacerbating dry conditions and enabling sparks to take hold. For instance, virtually the whole of the Murray-Darling Basin has experienced record-breaking heat this year (2019)," the *'This is Not Normal'* report stated.

Global warming is also causing an increase in the length of the fire season. The Australian fire season usually takes place in the height of summer in January and February, but this year the season started in early spring. The lengthening of the fire season has led to an overlap with the northern hemisphere season, making the international sharing arrangement for expensive firefighting gear, such as aeroplanes and helicopters that dump fire retardant, far more difficult.

"We're all feeling it... As fire seasons ramp up and get longer—and they definitely seem to be doing that, the science tells us that—it places more demand on aircraft to support the firefighting," general manager of Australia's National Aerial Firefighting Centre Richard Alder told the *New York Times*.

One of the most devastating and tragic aspects of global warming is the increased intensity of the forest fires with many being assessed as at the catastrophic level. These fires are so fierce that firefighters are powerless to put them out.

This category of fire was first developed after the 2003 Canberra fires and the 2009 Black Saturday fires in Victoria that killed 179 people. It was the first time in Australia that fires were known to produce their own weather pattern—a supercell thunderstorm known as a pyrocumulonimbus cloud.

According to Australian Capital Territory (ACT) emergency services, this produced horizontal winds of 250 km/h (160 mph) and a vertical air speed of 150 km/h (93 mph), and the resulting pyrocumulonimbus cloud produced a flashover covering 120 hectares (300 acres) in 0.04 seconds. A flashover is a near simultaneous combustion.

Last year on 12 November the greater Sydney area, including surrounding districts of the Blue Mountains, the Greater Hunter and Central Coast, the Illawarra and Shoalhaven regions, confronted catastrophic level fires. It was the first time the category applied to such a large populated area, consisting of six million people.

Such firestorms are known to occur in unstable weather conditions accompanied by low humidity, strong winds and

high temperatures. According to the *'This is Not Normal'* report, with the greater Sydney fire "the atmosphere was relatively stable and therefore shouldn't have been conducive to these wildly unpredictable and dangerous events. Yet it happened."

Global warming is also producing an increased frequency of lightning strikes that start fires. A paper published in the *Science* magazine in 2014 entitled *Projected increase in lightning strikes in the United States due to global warming* estimated a 12 percent increase in strikes for every degree Celsius of warming.

According to an article published in the *Scientific American* in October 2017, *Here's What We Know about Wildfires and Climate Change*, bushfires set up feedback loops. Trees and plant life in general are stored repositories of the greenhouse gas, carbon dioxide. When the plants are burnt the carbon dioxide is released into the atmosphere increasing greenhouse gases and increasing global temperatures. In fires such as those in Alaska, Siberia and Sweden, metres in depth of peat can burn in a single fire.

"One good fire that burns a metre or two [deep] could release many thousands of years of carbon accumulation in one blast," director of the Western Partnership for Wildland Fire Science at the University of Alberta in Canada, Mike Flannigan, told *Scientific American*.

Scientists predict that the number and ferocity of bushfires will increase in the future. The *'This is Not Normal'* report predicted that from 2019, the number of "very high" or "extreme" fire days could increase by 4 to 25 percent in 2020 and 15 to 70 percent by 2050. The report cites several studies that all indicate that fire conditions in NSW and Queensland will "increase substantially by the end of the century."

Australia is facing a bushfire season of horrendous proportions due to climate change. Scientists know what needs to be done in order to halt the steady increase in greenhouse gases but this cannot occur under the capitalist system dominated by short-term profit and the outmoded division of the world into rival nation states. Governments around the world are unable to agree on an international plan and to offer anything more than cosmetic measures.

Only a planned socialist society can end social inequality while at the same time implement an international plan to reverse the ravages of climate change.



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