The era of megafires: the crisis facing California and what will happen next
By Daniel Swain, Crystal Kolden and John Abatzoglou / Wed 8 Aug 2018 / theguardian.com

Firefighters with Cal Fire tackle spot fires near the town of Clearlake Oaks in northern California. Photograph: Mark McKenna/Zuma Wire/REX/Shutterstock

Three scientists explain the unprecedented danger facing the western US and call for new solutions to a growing threat

California is no stranger to fire. The temperate winters and reliably dry summers that make the Golden state such an attractive place to live are the same conditions that make this region among the most flammable places on Earth.

But even for a region accustomed to fire, the continuing wildfire siege has proven unprecedented. Although it is only early August, numerous very large, fast-moving, and exceptionally intense fires have already burned vast swaths of land throughout the state – consuming hundreds of thousands of acres and thousands of homes and claiming at least nine lives, including four firefighters. State and national firefighting resources are stretched to their limits; choking smoke inundated the state capital of Sacramento; and much of Yosemite national park is closed indefinitely.

California’s governor, Jerry Brown, has characterized these devastating wildfires as California’s “new normal”. But it would be a mistake to assume that the region has reached any semblance of a stable plateau. Instead, the likelihood of large, fast-moving, and dangerous wildfires will continue to increase in the coming decades – and it will
combine with other demographic and ecological shifts to produce a large increase in the risk of megafires that threaten both human lives and the ecosystems we depend upon.

**Fueling the fires**

Immediately on the heels of California’s deadliest and most destructive fire season, just a year ago, the early ferocity of 2018 has unnerved even veteran firefighters. While the number of fires in California to date is unremarkable, the total area burned is extraordinary: five times the five-year average, in a decade that has already been characterized by fire activity well above historical levels.

The causes are complex, and people are part of the problem. In 1980, 24 million people lived in California; today there are nearly 40 million. Much of this population growth has occurred outside of the dense urban core of cities, resulting in rapid expansion of housing in suburban and semi-rural areas adjacent to wildlands.

Of the tens of thousands of homes burned by wildfires in California in recent decades, nearly all were located in this suburban-rural borderland. With housing shortages and high prices plaguing cities throughout the state, it is unsurprising that residents build on the fringes, places often replete with natural beauty. Yet residents are often unaware of the risks inherent in living there, and the need to mitigate those risks accordingly – their lives may depend upon it.

Another exacerbating problem: the way we historically managed our forests. Demand for timber in the early 20th century ushered in a new era of federally mandated fire suppression. This national policy has been highly successful at achieving its intended goal: historically, 98% of new fires are extinguished before reaching the relatively modest size of 300 acres.

But while this well-intentioned policy of “total suppression” certainly reduced the amount of land burned in wildfires, it also had an unintended side effect: a deficit of low-intensity and forest-regenerating natural fires. This deficit has allowed for an accumulation of wildfire “fuel” in the form of more densely spaced trees and thicker undergrowth in areas that had previously experienced frequent fire. Forests and wildlands are increasingly “primed to burn” under hot and dry conditions.

Enter climate change, wildfire “threat multiplier”. While record-breaking heatwaves grab headlines, some of the most consequential warming in California (from a wildfire perspective) is more subtle. Nights have warmed nearly three times as fast as days during fire season – lowering night-time humidity and supporting unprecedented nocturnal fire behavior.

Declining spring snowpack and increased evaporation have reduced the moisture available to plants later in summer and autumn. The fire season itself is lengthening: not only have autumn and spring temperatures risen, but there are signs that
California’s already short rainy season is becoming further compressed into the winter months. We are truly burning the candle at both ends.

Despite this confluence of factors, the total number of fires in California has not increased in recent decades. Instead, climate change appears to be manifesting itself primarily through changes in the character (rather than frequency) of wildfire. Flames are spreading more rapidly and with greater intensity. Around half of the increase in area burned during western forest fires in recent decades can be attributed to the long-term warming trend.

In California, not all wildfires are forest fires – some of the state’s deadliest and fastest-moving fires have burned primarily in shrubs and oak woodlands. With climate change tipping the scales in favor of hotter temperatures and drier conditions across the entire landscape, vegetation of all types is becoming more flammable.

**Facing the megafires to come**

Just as Californians have found strategies to cope with the ever-present risk of earthquakes and other natural hazards, resilience in a dawning “era of megafires” will require Californians to proactively adapt to the wildfires of the future.

California already has the largest dedicated wildland firefighting agency in the country by far – a veritable army comprised of thousands of firefighters and an enviable fleet of vehicles, aircraft, and helicopters.

And some California communities have already made considerable progress in enacting building and landscaping codes to reduce fire ignition potential in urban areas, encouraging and facilitating “defensible space”, and developing emergency evacuation plans to limit risks to citizens and firefighters alike.

But given the inevitability of wildfire, thousands of other vulnerable communities will need to follow this lead or face a repeat of tragedies on the scale experienced in Santa Rosa, Ventura, and Redding over the past year. In the era of megafires, our choice is clear: find new solutions or face even greater disasters.

*Dr Daniel Swain is a climate scientist in the Institute of the Environment & Sustainability at the University of California, Los Angeles. Dr Crystal Kolden is an associate professor of fire science at the University of Idaho. Dr John Abatzoglou is an associate professor of climatology at the University of Idaho*