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Climate Change Behind Surge in Western Wildfires

By [John Upton](#)Follow [@johnupton](#)

Published: October 10th, 2016

Western firefighting veterans lamenting a “new normal” amid surging forest fires have received an explanation for the destructiveness they’ve been unable to quell. Rising temperatures are flatly to blame for recent fearsome fire seasons, leading scientists reported Monday.

The number of acres of forest burning yearly in large Western fires ballooned nine-fold from 1984 to 2015, with climate pollution and natural changes in the weather playing roughly equal roles in driving the deadly trend, research published in [Proceedings of the National Academy of Sciences](#) concluded.



The Erskine Fire spread so quickly in southern California earlier this year that some residents died before they could flee.

Credit: John Upton/Climate Central

The study showed that more than a century of fossil fuel burning, deforestation and farming has helped push the American West into an explosive new wildfire regime, and the findings suggest far worse could be ahead.

“The authors clearly demonstrate that a human influence on wildland fire as a consequence of global warming isn’t just a prediction for the future — it’s happening now,” said [Kevin Anchukaitis](#), a University of Arizona scientist who was not involved with the study.

Previous efforts to link Western wildfires with climate change have [hinted at a profound relationship](#) but led to unconvincing results, largely because long lists of factors influence ignition and wildfire properties.

Monday’s study focused on forest dryness, identifying the commanding role it has been playing in driving fires. The researchers relied on climate data and modeling to present a sweeping regional view of 30 years of worsening forest fires.

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"The exact percentage of human contribution remains uncertain, but the overall relationship — an increase in fuel aridity, fire days, and fire extent — is clear and significant," Anchukaitis said. "The statistical analysis is very convincing and elegantly done."

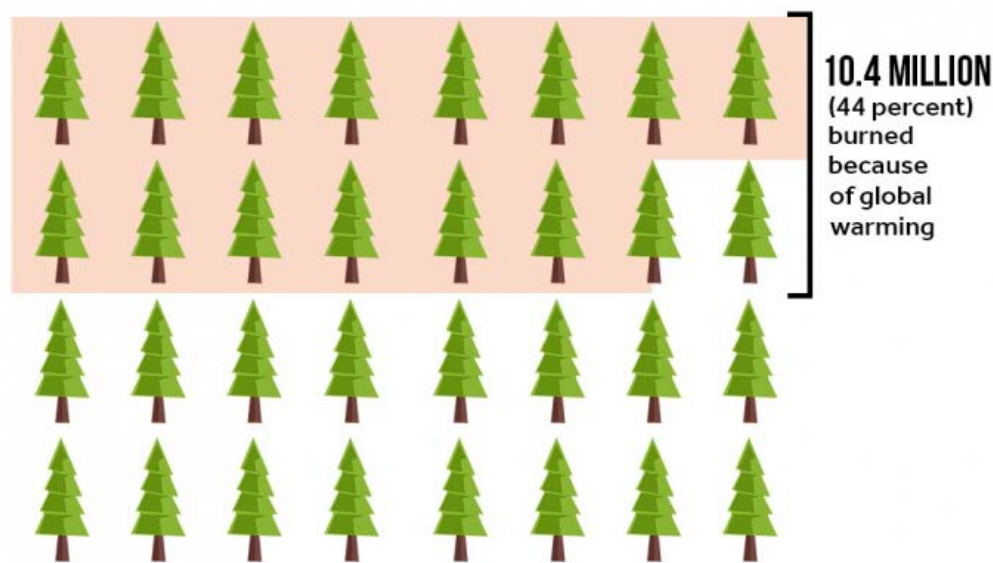
Western wildfires have been devouring forests parched by higher temperatures in recent years, draining federal and local firefighting funds, killing residents unable to flee fast-moving flames and filling skies with [sometimes-crippling levels of air pollution](#).

The new analysis showed temperature increases caused by rising levels of greenhouse gas pollution have had a drying effect on Western forests that caused 10.4 million acres to char in large fires during the three decades.

That suggests 44 percent of the forest area that burned during the three decades analyzed burned because of the effects of global warming. The finding was an estimate, with the researchers concluding global warming likely drove between 6 million acres and 16 million acres of forest fire.

Warming Causes Western Forests to Burn

23.5 million acres burned in Western forest fires from 1984 to 2015



Source: Abatzoglou and Williams, "Impact of anthropogenic climate change on wildfire across western US forests," PNAS, 2016

CLIMATE CENTRAL

Greenhouse gas pollution was also found to have extended fires seasons and caused additional days of severe fire danger.

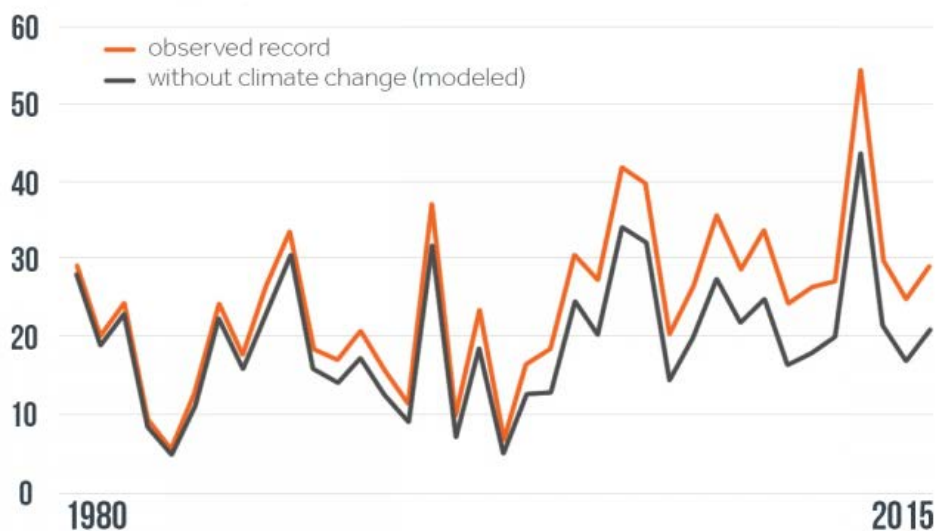
The "compounding effects" of climate change and natural weather fluctuations are "giving rise to this remarkable increase in forest fire activity," said [John Abatzoglou](#), a geographer at the University of Idaho who coauthored Monday's paper.

Even as greenhouse gas pollution has warmed the planet's surface in recent decades, warming rates across the West have been exceptionally rapid. That's [largely because of the effects](#) of a slow-moving ocean cycle, the Pacific Decadal Oscillation, which influences the global climate.

Warming caused by natural climatic variation was blamed for the burning of 11.4 million acres of Western forests during the study period — slightly more than the effects of warming caused by humans.

Climate Change Raising Western Forest Fire Risk

Days with very high wildfire potential



Source: Abatzoglou and Williams. "Impact of anthropogenic climate change on wildfire across western US forests." PNAS, 2016

CLIMATE CENTRAL

The study focused on the heavy role that temperatures can play on forest fires, ignoring other kinds of wildfires, such as those afflicting grasslands, and ignoring other factors that can shape fire seasons. Fires need ignition sources to get started — these include lightning strikes, arsonists and campfires. They're also affected by the thickness and type of vegetation that they consume, which in turn are shaped by weather, climate and wildfires.

"While this paper is an important contribution, we still face several open questions about other drivers of change on fire regimes," said [Max Moritz](#), a fire ecology and management scientist at the University of California, Berkeley. He was not involved with the research.

"We're going to have more wildfire on many of these landscapes," Moritz said. "We need to re-examine where and how we build our communities, so that we can learn how to better coexist with wildfire — similar to how we've adapted to other natural hazards."

California Gov. Jerry Brown and Nevada Sen. Harry Reid have directly linked the "new normal" of Western wildfires with global warming. Monday's findings lent scientific credence to these claims.

"The effect of warming on fire activity is actually exponential," said [Park Williams](#), a scientist at Columbia University who produced Monday's study with Abatzoglou. "That means that every degree of warming has a bigger impact than the previous degree of warming."

A United Nations climate treaty [will take force next month](#) that's designed to spur nations to work together to reduce their impacts on the climate, such as by ditching coal energy in favor of cleaner alternatives. Exhaustive work and escalating political commitment will be needed if the civilization-saving potential of the Paris climate agreement is to be realized.

"Even though climate is changing gradually, the way that fire responds is not gradual," Williams said. "As warming continues, there will probably be another leap, where fires are getting quite a bit more energetic — and quite a bit larger."

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Comments

By Geoff Beacon (UK)
on October 11th, 2016

The increase in forest fires is missing from IPCC climate models.

Climate will be worse than predicted.

<http://www.brusselsblog.co.uk/missing-feedbacks-ignored-by-ipcc-models/>

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By entrance (Austria)
on October 11th, 2016

The problem is that there are too many people on this Earth. Nice graph:

https://upload.wikimedia.org/wikipedia/en/3/3a/Human_population_growth_from_1800_to_2000.png

Overpopulation causes a lot of problems, not just only air pollution and global warming, but also mass extinction of animal species, water pollution, increasing difficulties to supply water and food, increased emergence of new epidemics and pandemics, elevated crime rate, and so on. A graph that shows the direct relationship between world population and CO2-emissions: <http://www.marketcalls.in/wp-content/uploads/2010/11/Correlation.jpg>

If we were able to solve this main problem overpopulation, we would automatically solve the mentioned problems too.

I am ready to help.

[Reply to this comment](#)

By Brother Raphael (massillion, Ohio)
on October 11th, 2016

I think climate change has affected the writer's brain..

[Reply to this comment](#)

By Nina Horsley (Cave Junction, OR 97523)
on October 13th, 2016

Last year in Oregon there were 202 fires. A large percent caused by logging operations, Oregon Dept. of Forestry. This year over 400, KOB15 news, over 1.5 Billion dollars this year in suppression costs.

I live here next to our federal BLM forests, that used to moist and thick and full of a diversity of all species of life, in 20 years it has reached the point, that if they do follow thru with the East/West junction timber sale, do allow the timber industry to cut it, to go thru and remove every tree over 8" in diameter, it will completely destroy the water supply of the Illinios Valley, in Josephine County, Oregon. And contribute to the demise of at least 5 river systems, in Southern Oregon and Northern California.

Based on the rate of over thinning on public forest land, and the clear cuts on private timberland, coupled with the use of pesticides, we have destroyed our forests ability to maintain it's own moisture levels and provide us with our water, our most precious resource. Without forests there is no reliable water cycles.

Forests absorb large amounts of water all rainy season long. Holds it until the temperatures increase to the point where trees then evaporate moisture into the atmosphere, which then starts our winter water cycle again. No more we have broken the back bone of our planets forests.

This is the reason the wild fires are up. That and the fact that we changed our approach to fighting fires. It's become a muti-billion dollar boon to those that own business', in the timber industry, who send people out to fight them, and you get to cut down the trees that may not be dead, but the fire gives the industry another way to make money off of a system that is self-serving to the point of self-destruction, killin millions of peoples water supply.

My local lumbermill started a forest fire last year thru sheer stupidity, and they still to this day, have not been held responsible, for the fire. They were unable to stop the fire before it burned down a neighbors house and out building, jump the river and come within 1000 ft from my home, and put my neighborhood in line for a direct hit to a completely avoidable event.

Nor is BLM enforcing the laws to protect our water supply, to maintain permanant forestry production, all facets, protect our water shed.

I apologizes for ranting, these are just the facts that I have seen happen before my own eyes, 50 years of playing, living, working and feeding from the forests. They give us more than just lumber. It's not too late to stop destroying the forests that provide us with water, they can recover if we just stop logging, thinning and spraying, and to put the fires out, instead of watching them burn down and rip up large swatched of forests with bulldozers that are no where near the fire. Just to increase the rate of timber harvests.

No self respecting farmer intentionally destroys the very plant they need to make a living or survive on, but the timber industry, going from country to country, raping the land. Accept the petro, coal and chemical industries, they are poisoning our water supply faster than anyone could imagine, look at Flint, Michigan, North Dakota, the oil sand tar pits in Canada.

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By Mal Adapted
on October 18th, 2016

Ms. Horsely, you are correct that forestry practices, along with decades of over-zealous wildfire suppression, have contributed to greater

wildfire activity in Oregon. This article explains why they are not the only reason for it.

The article links to another one on the relative contributions of natural and anthropogenic factors to the "exceptionally rapid" warming across the American west since the 1980s. There is no disputing that warming has occurred, though. It would be surprising if wildfire activity in the region had *not* increased as a result, even if there were no other changes like those you described. That's because the rate of evapotranspiration, by which plants take up water from the soil and release it to the atmosphere to drive photosynthesis, increases with the temperature. For plant communities, warming equals drying.

The growing season starts in Oregon when it's warm enough for trees to begin drawing on soil moisture that accumulated during the winter. With warming, growing seasons are beginning earlier; and reduced snowpack at higher elevations is leaving less water available in late spring, as rainfall tapers off. Now when the rains stop each summer, forests have already begun to dry out, so that fire season is beginning earlier as well.

I'm afraid it's all too easy to understand why Oregon is seeing more wildfires. In the long term, as warming continues we will see forests giving way to shrub- and grasslands, migrating north along the coast and higher into the Cascade mountains. It's what the pride of man has wrought.

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By FRANK PAPAN (virginia beach, va. 23452)
on October 17th, 2016

I'm 75 years old and remember reading about all of the fires on the west coast for most of them, even lived there for awhile. millions of acres being burned every year, with choking fumes all over southern California being the normal thing—EVERY YEAR. 1 REASON I MOVED OUT OF THERE.

WHEN THEY USED TO TEACH HISTORY IN SCHOOLS, we were taught of the dry spell our country suffered from that spread all across our country—the great dust storms that we don't seem to get anymore.

it seems like all of the damage to humans out there was because more humans moved into the state cutting down all of those trees to live around. - I remember our government deciding to let them burn—remember?

I remember a million areas burning in a year, more than once.

do I believe our planet is getting warmer?— AGAIN?—OF COURSE I DO, but that man is causing it.

I compare it to a flea on a rhino's hide hurting her.

I trust my government as much as I think that the Rhino can swat that flea off, if it even knew it was there.

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By Mal Adapted (Kennewick, WA 99336)
on October 17th, 2016

Mr. Papan:

"do I believe our planet is getting warmer?— AGAIN?—OF COURSE I DO, but that man is [not?] causing it.

I compare it to a flea on a rhino's hide hurting her.

I trust my government as much as I think that the Rhino can swat that flea off, if it even knew it was there."

If you don't trust your government's data, why do you believe it's getting warmer? Whose data do you trust?

You say you don't believe man is causing global warming, because you believe humanity's ability to affect the Earth's climate is comparable to "a flea on a rhino's hide". To be blunt, this is the argument from ignorance, or as Carl Sagan called it "the argument from personal incredulity". At 75, you're hardly too old to consider the evidence. The conclusion that the current warming is anthropogenic stems from three facts:

1. CO2 traps heat in the atmosphere, and that adding more CO2 to the atmosphere traps more heat. That was shown in the 19th century, by a Frenchman, Joseph Fourier (1826); an Englishman, John Tyndall (1859); and a Swede, Svante Arrhenius (1896).

2. Atmospheric CO2 has increased from about 275 ppm in 1750 to 405 ppm in 2016. That's based on samples of atmospheric gases trapped in Antarctic ice, and since 1959 on direct sampling of the atmosphere by Charles Keeling and his son Ralph.

3. Humans have burned about 500 billion tons of fossil carbon since 1750, about twice the amount needed to account for the increase in atmospheric CO2. That's based on estimates by the Carbon Dioxide Information Analysis Center at Oak Ridge National Laboratory—your government's data, but again, if you don't trust you're governments data, whose do you trust?

Given 1 - 3, it would be astonishing if warming had not occurred. In fact, global mean surface temperature has risen at least 1 degree C since 1750, and about 0.75 degrees since 1959. No known natural factors can account for the increase over time. It is very hard to explain the increase in GMST any other way than that man has caused it by burning fossil carbon for energy.

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By Noel Darlow (Scotland)
on October 22nd, 2016

A significant, long-term increase in fires must raise the question if a fundamental change in habitat from wooded regions towards more open savannah is underway.

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