Fires have been unusually severe lately. According to one scientist,

> "'[I]n the late 20th and early 21st century, with these hot droughts, fires are ripping now with a severity and ferocity that's unprecedented,' says Tom Swetnam. . . . A fire in the Jemez Mountains Swetnam studies burned 40,000 acres in 12 hours, a 'horizontal roll vortex fire' that had two wind-driven counter-rotating vortices of flame. 'That thing left a canopy hole with no trees over 30,000 acres. A giant hole with no trees,' he says. 'There's no archaeological evidence of that happening in at least 500 years.'"

In line with this scientist's perceptions, the U.S. government's 2017 Climate Assessment concluded that "[r]ecent decades have seen a profound increase in forest fire activity over the Western United States and Alaska."

Causation is a complicated issue in the context of wildfires. As the 2017 Assessment explains, "the frequency of large wildfires is influenced by a complex combination of natural and human factors," including "[t]emperature, soil moisture, relative humidity, wind speed, and vegetation (fuel density)." Details of weather matter. Wind patterns can make a fire spread much more quickly. Heavy precipitation followed by drought can create a worst-case scenario, with the rains leading to heavy vegetation growth, which is then killed, dried, and converted into tinder by drought. Insects and plant diseases can kill trees, again creating tinder for fires. Dry air can also help fires spread more quickly. On the other hand, if vegetation disappears, there may not be much to burn.

Despite the complications, there are strong reasons to link wildfires and climate change. For instance, a 2016 study of fires in the Western United States concluded that climate change more than doubled the area burned by forests fires from 1984 to 2005. The result: an additional 16,000 square miles destroyed. The 2017 Assessment – keep in mind that this was issued by the government during the Trump Administration – says that fires used to be rare in Alaska, but "historically less flammable tundra and cooler boreal forest regions could shift into historically unprecedented fire risk regimes" due to rising temperatures. Thus, the Assessment says, the risk of large fires in Alaska "has *likely* increased by 33%-50% as a result of anthropogenic climate change and is projected to increase by up to a factor of four by the end of the century under the mid-high [carbon emissions] scenario."

There is also some evidence that climate change contributes to some of the specific weather patterns that promote fires. For instance, the NY Times reports, scientists believe that climate change will increase weather variability in California, augmenting the likelihood of wet growing seasons followed by arid conditions. According to the *Washington Post*, before the Carr fire in California this summer, the area had broken the temperature record for July and humidity had dropped dangerously low. The fire quickly spread over 100,000 acres. This weather is a product of unusual patterns in the jet stream, which some scientists are firmly convinced are the result of climate change.

Because fire causation and spread are complex, it's hard to be confident about just how much impact climate change will have in coming decades, at least outside of Alaska where the predictions are strongest. But there's every reason to expect more large fires in our future. In my next post, I'll discuss how we can manage this increased risk – beyond getting smarter about reducing carbon emissions, of course!

Next up: Mitigating the Risks.