Global warming: Increased frequency and severity of forest fires

Michael Barnes
barnes_m@denison.edu
Denison University, Granville, Ohio

Introduction

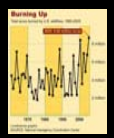
Just this October, forest fires forced more than a half million people from their homes in Southern California. The damage, devastation, and destruction of forest fires, however, is not limited to Southern California. Wildfires are ramped all across the Southwestern portion of the United States and all across many other nations of the world (Brazil, Greece, Australia, etc) in late summer and early fall. Sadly, this year was not unlike those of recent memory. It seems like the intensity and frequency of these disastrous wildfires has been significantly increasing over the past few decades.

So, the question is why? Why are there so many enormously severe and gigantic forest fires? Why does it seem like each time we turn on the news in August, September, or October, we are finding out about another life threatening, and ecologically damaging forest fire? Many experts believe the increased frequency and intensity of these forest fires is related to our current problem with global warming. Although they cannot tie the effects of global warming directly to the increase in forest fires, they do believe that the higher world temperatures increase the likelihood of these relentless forest fires.

A fire fighter walks by a bad fire on a hillside in Jamul, Calif.

Supporting Evidence

- Almost seven times more forested federal land burned during the 1987-2003 time period than the prior 17 years
- Large fires occurred about four times more often during that same time period
  - These increases are strongly linked to higher March-through-April temperatures and are most pronounced for mid-elevation forests in the northern Rocky Mountains
    - High temperatures led to early snowmelts, resulting in longer, drier summers and falls
  - The length of the fire season has increased almost two-and-one-half months compared with 1970 to 1986
  - 56% of wildfires and 72% of the total area burned occurred in early snowmelt years
- Not confined to the United States
  - Canada has reported similar results covering the time period from 1920-1999
  - In 1998, following the worst drought in 30 years, 14 million acres of the Amazon Forest went up in smoke
  - Wildfires blazed in Greece in recent years
  - Wildfires are prevalent and destructive across the Australian continent
  - Wildfires in Russia have become more intense and prevalent over the past few decades, correlating strongly with the global climate change



A graph showing the increased area burned by wildfires.

Fires and Ecosystems

- Wildfires create an amplified global warming effect
  - Wildfires are a consequence of global warming . . . when they occur, they add an estimated 3.5 x 10^{15} g to the atmospheric carbon emissions or, roughly, 40% of fossil fuel carbon emissions
- Possible erosion
- Soil degradation
- Possible introduction of non-native species
- Pollution of water
- Air pollution
- Wildfires, however, are a necessary and natural aspect of any healthy ecosystem
  - Fires nourish grasslands
  - Often can help control invasive species
  - Create more space for growth in a crowded forest
  - Help fire-dependent seeds burst and germinate
  - Create an environment that favors native species and diversity of wildlife
- Fire suppression tactics only increase the fire fuel and lead to larger more destructive fires
  - Sometimes need to just control a fire not deter or stop it

Mt. Evans State Wildlife Area after a prescribed burn. Burn removed debris and encouraged the growth of desirable plants.

Two images of large scale forest fires engulfing hundreds of acres of wilderness.

Effects on Humans

- Wildfires globally
  - Claim hundreds of lives yearly (i.e. 14 in San Diego and 64 in Greece this year)
  - Wildfires caused billions of dollars in damage yearly.
    - Billions of dollars more in the infrastructure and efficiency damages
  - Thousands of homes are destroyed
  - Millions of people are displaced and evacuated form their homes
  - Tons of crops and livestock are destroyed and killed
- Many long-term health problems are also associated with large-scale wildfires
  - Pollution pours into the atmosphere, creating the circumstances for long-term lung and respiratory problems
- Human population continues to push farther and farther into forested areas
- In southern California, 95 percent of wildfires are caused by humans
- Most fires occur near the wildland-urban interface

Fire creeps toward a home situated in the woods.

Fire burns down a hillside toward a town.

A wildfire jumped to a house situated in the forested hills of the western United States.

People evacuate their homes as a severe wildfire approaches from the hills.

Conclusion

Tremendously intense and destructive wildfires have become a common theme among the nightly news shows and the daily newspapers during the late summer and early fall. Every time we pick up our heads and look out west, it seems like there is yet another wildfire engulfing hundreds of thousands of acres and encroaching on the local community. **Catastrophic wildfires used to be very infrequent, but, in recent decades, they have become regular occurrences. They destroy ecosystems and pour immeasurable tons of green house gases into the atmosphere.** They decimate entire communities and leave people without homes and friends. They cause billions of dollars in damage yearly, and they leave people wondering why. **The answer lies in our current global climate change. As our climate gets warmer, snowmelt happens earlier, summer and fall lasts longer, and droughts become more accentuated. As forests and grasslands dry up from severe droughts, they become more susceptible to massive wildfires.** The dry areas ignite easily and spread fires at an astounding rate. The increased number of severe wildfires is not the sole fault of global warming. **The fire suppression tactics of the past century in America have also been a major contributor to the increased number of wildfires. Trying to control and suppress possible wildfires just magnifies their intensity when they do break out.**

A forest fire raging across the tree tops in a very dense forest.

Individuals who inhabit locations where wildfires are prevalent and likely, need to understand and be willing to accept the risks. Forest managers and wilderness rangers have to do what they can to control the severity of forest fires. **Cleaning out dry, dense forests and controlled burns are just a few ways to minimize the risk of devastating wildfires.** Wildfires will always be a natural occurrence in nature, and, with the increasing global temperature, they are sure to increase in frequency over the next century. **So, instead of trying to prevent and eliminate destructive wildfires, individuals must attempt to control and limit the extent of their damage.** There are countless examples of such efforts. **Forest managers across the southwest, with assistance from various universities, are focused on cleaning up the debris and fuel of forest fires and are determined to identify high risk areas.** Hopefully, these efforts will amount to noticeable differences, thereby limiting the number of intense and, ultimately, devastating wildfires.

This poster was developed as an assignment for Honors 295 **Population, Environment, and Sustainability—Ethics for Living into the Future.**

References can be obtained by contacting the author.

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