



Wildfires

Separating demagoguery from the science. By Jim Steele

In 2016 Climate Central, notorious global-warming demagogues, published the article “Climate Change’s Fingerprints All Over California Wildfires.” Ignoring a well-documented history of natural climate change, ignoring the ill-advised 20th century policy of fire suppression, and ignoring the increased percentage (approximately 80 to 90 percent) of fires ignited by humans, Climate Central tried to persuade the public that California fires (as well as all recent fires) are “part of a dire global warming-fueled trend toward larger, more frequent and intense wildfires.”

Whether you believe recent warming is natural or caused by rising CO₂, warmer temperatures have promoted better growing conditions and that has been good for man and beast. During the Little Ice Age tree lines retreated. From the 1400s to the end of the 1800s forests thinned, especially where it was too cold for tree seedlings to establish. Since the beginning of the 20th century that trend has reversed, our climate warmed, and growing seasons lengthened. Indeed, more warmth can generate more wood for fires. On the other hand, along with improved

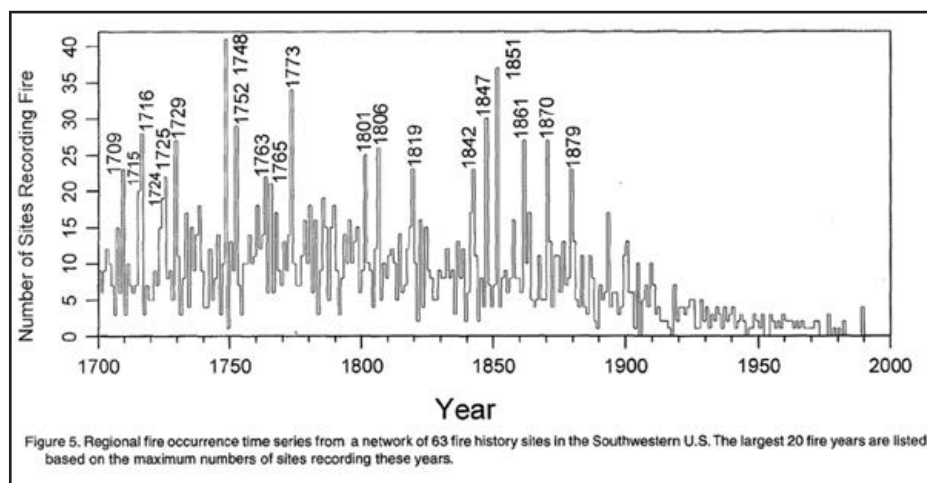
agricultural efficiency, this more favorable growing climate has allowed us to feed a rapidly growing global population despite Stanford scientist Paul Ehrlich’s dire predictions that we would experience mass starvation by the 1970s.

The Fire Suppression Effect

The statistical rise in fires since 1970 is mostly due to changes in fire suppression policies. The debate over pros and cons of fire has a long history. Native Americans had used fire to promote favored food plants and wildlife. Fire historian Stephen Pyne noted that timber owners and ranchers in California promoted the use of prescribed “light burning” in the 1880s to reduce fuels, maintain pastures and reduce the likelihood of larger more-destructive fires. Small natural wildfires also created natural firebreaks and a patchy forest mosaic that reduced a fire’s ability to spread beyond a local patch.

Unfortunately, a few terrifying fires led land managers to embark on a policy of complete fire suppression. The Peshtigo, Wis., fire of 1871 blackened 1.5 million acres and caused the deaths of 1,500 to 2,500 people. Fires threatened recently formed Yellowstone National Park in 1886, and the Army was called in to fight it.

But by 1996 fire ecologist Thomas Swetnam echoed the growing consensus against fire suppression. He wrote: “The paradox of fire management in conifer forests is that, if in the short term we are effective at reducing fire occurrence below a certain level, then sooner or later catastrophically destructive wildfires will occur. Even the most efficient and technologically advanced firefighting efforts can only forestall this inevitable result. It is clear



By examining tree rings and dating the ages of fire scars from old living trees on 64 study sites in Arizona and New Mexico it was determined fires occurred on five or more sites each year and more widespread fires burning 30 percent to 40 percent of all sites happened every 10 years on average until fire suppression began in the early 1900s. SOURCE: Swetnam (1999) *Historical Fire Regime Patterns in the Southwestern United States* <http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1085&context=barkbeetles>

OPPOSITE: Unfortunately, large fires are more likely today because past fire suppression has caused an unnatural buildup of fuels.

from many years of study and published works that the thinning action of presettlement surface fires maintained open stand conditions and thereby prevented the historically anomalous occurrence of catastrophic crown fires that we are experiencing in today's Southwestern forests."

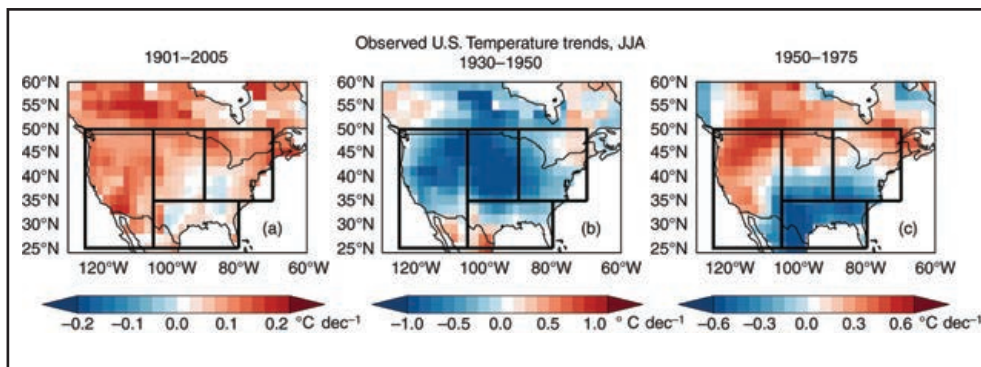
Around the 1970s, some government agencies began adopting "let it burn policies" if human habitat was not threatened. An increasing use of prescribed burns attempted to reduce abnormal fuel loads and restore the natural fire balance. But fire ecologists still "estimated that approximately three to six times more area must be burned to restore historical fire regimes." The unnaturally low fire frequencies of the 1980s and '90s can be seen in the graph on previous page from a 1999 research paper by Dr. Swetnam. Based on fire scars of old living trees from 64 Southwest study sites, fires were five to 15 times more numerous and widespread between 1700 and 1880 than during the 1990s. When global-warming demagogues argue that climate change has now resulted in five times more fires than observed in the 1970s, they fail to inform the public that this increase is largely due to a shift away from the previous complete fire suppression policy to selectively allowing fires to burn.

Not only were fires naturally more common before "global warming," but earlier fires could be huge. Newspaper articles from Tucson, Ariz., reported individual fires that scorched over a million acres before 1890. Elsewhere, Wisconsin's Peshtigo Fire blackened 1.5 million acres in 1871 and over three million acres were torched in the Big Blowup (aka the Great Fire of 1910). The largest fire in Canadian history was the Miramichi Fire of 1825 that burned three million acres in New Brunswick and extended into the state of Maine. Unfortunately, large fires are more likely today because past fire suppression has caused an unnatural buildup of fuels.

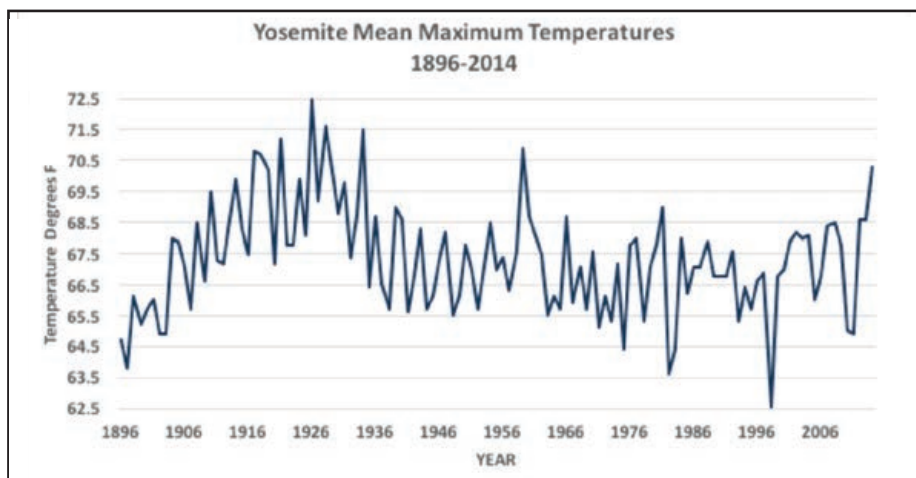
Misuse of Global Average Temperatures

Fires are more likely during droughts. So

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The United States "warming hole" is a region in the southeast/central U.S. where observed long-term surface temperature trends are insignificant or negative. Temperature trends were associated with different factors in different seasons and different time periods. The summer warming hole was associated with cooling effects of aerosols. The winter warming hole (not shown) was driven by the Pacific Decadal Oscillation and North Atlantic Oscillation. SOURCE: Mascioli et al. (2017) Timing and Seasonality of the United States "Warming Hole"; Environ. Res. Lett. 12 <http://iopscience.iop.org/article/10.1088/1748-9326/aa5ef4/meta>



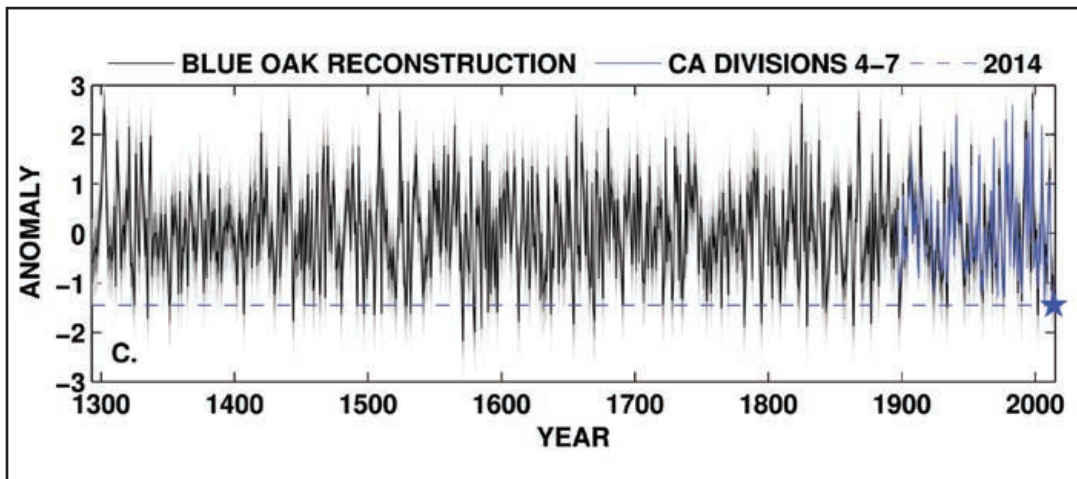
Average maximum monthly temperatures from 1896 to 2014 at Yosemite National Park show a sharp increase from 1900 to 1930 followed by cooling to 1950 and no significant trend thereafter. SOURCE: Data downloaded Aug. 20, 2017, from U.S. Historical Climatology Network <https://www.ncdc.noaa.gov/ushecn/>

demagogues blame a "dire global warming-fueled trend" for increasing droughts and, thus, fires. But regional temperature trends usually differ from the global-average statistic. For example, the western Arctic was cooling in the '80s and early '90s until shifting winds removed thick insulating ice into the warmer Atlantic, allowing stored subsurface heat to more readily ventilate. Arctic temperatures then rose twice as fast as the global average. In contrast, the eastern half of Antarctica has not warmed at all.

The misleading use of a global-average statistic reminds me of an old joke. A man got

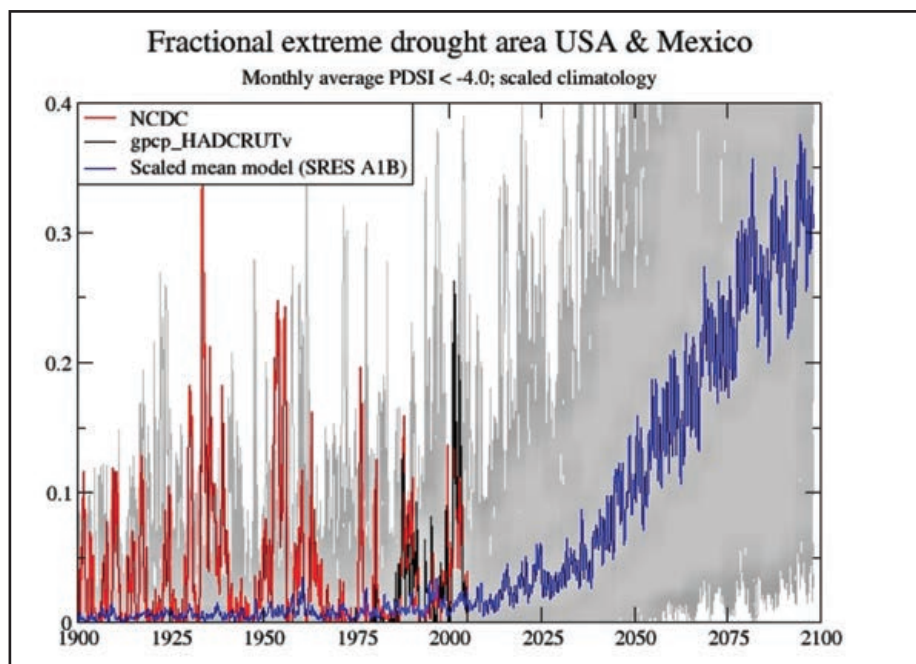
his head stuck in a hot oven. While trying to extricate himself he got his feet stuck in the freezer. Not knowing what to do, his wife summoned a doctor hoping he could ease her husband's pain. But after a careful examination, the doctor concluded her husband was just fine. On average, his body temperature was perfectly normal.

In contrast to the global average, the Southeastern United States has not warmed since 1900. The illustration at top is from a 2017 research paper, "Timing and Seasonality of the United States 'Warming Hole.'" It shows summer temperatures cooled by about 1°C from 1930 to 1950. While warmth in the northern United States began to recover from 1950 to 1975, the Southeast remained cool. Despite some recent warming, as of 2005 temperatures in much of the Southeast are still slightly cooler than 1901.



Examination of blue oak tree rings reveal that precipitation during the 2012-2014 California drought had been anomalously low but not outside the range of natural variability evidenced over the past 700 years.

SOURCE: Griffin, D., and K.J. Anchukaitis (2014), How unusual is the 2012-2014 California drought?, *Geophys. Res. Lett.*, 41 <http://onlinelibrary.wiley.com/doi/10.1002/2014GL062433/abstract>



The ability to reproduce observed temporal and spatial patterns of North American drought in 19 state-of-the-art climate models was examined. After adjustments to correct for substantial biases in the models' surface air temperature and precipitation fields, there were significant differences in the models' ability to reproduce observations. SOURCE: Wehner et al. (2011) Projections of Future Drought in the Continental United States and Mexico, *Journal of Hydrometeorology* <http://journals.ametsoc.org/doi/abs/10.1175/2011JHM1351.1>

In 2016, devastating fires burned more than 100,000 acres across seven states in the Southeast. The Public Broadcasting System's "PBS NewsHour" hyped the fires with the headline, "How Big Droughts and Forest Fires Can Become the New Normal in Appalachia." PBS interviewed U.S. Forest Service ecologist James Vose, who stated, "It's very rare to have this many fires burning this amount of area in the Southeast."

But before extensive logging, the Southeast was dominated by the longleaf pine, a fire-

adapted tree that depends on frequent fires to remove competing vegetation. Its widespread dominance could only be maintained by frequent forest fires. And with no warming trend since 1900, Appalachia's "old normal" was likely no different than the "new normal."

After America's widespread midcentury cooling, California's average temperature began warming in the 1970s. But as exemplified by temperatures in Yosemite, the trend in maximum temperatures for the northern two-thirds of California has declined since

the 1930s. Because maximum temperatures are the main determinant of heat stress, it is hard to honestly blame California's fires on a "dire global warming-fueled trend." (See "Yosemite Mean" chart on previous page.)

Extreme swings between wet and dry years, driven by El Niños and La Niñas, are exactly what natural climate change predicts. Periodic La Niñas induce droughts that amplify the effects of California's annual summer drought and cause anomalously high temperatures. El Niños induce greater winter rainfall and more growth that then serves as fuel for the next dry fire season.

California's blue oaks are sensitive to changes in precipitation, and based on their tree rings scientists have reconstructed California's precipitation anomalies. Negative anomalies indicate less rain and more drought and positive anomalies indicate heavier rains. The blue star in top graph highlights the extreme drought conditions of 2014 and the dashed blue line serves as a reference to 2014. We see that extreme drought conditions, similar to or worse than 2014, happened three or four times a century. Likewise there were frequent periods of anomalously high rainfall. Despite 700 years of these natural extreme weather swings, Stanford's Noah Diffenbaugh blames recent swings on global warming, stating, "This is exactly what state-of-the-art climate models predicted should have happened, and what those models project to intensify in the future as global warming continues."

Should We Trust Model Projections of Impending Doom?

There is no consensus among climate scientists regarding the effects of increasing CO₂ on the strength and frequency of El Niño events. Some models indicate more La Niña-like conditions; some models indicate more El Niño-like conditions. Tree rings suggest no trend since the 1300s. Most likely periodic droughts and high fire risks will always be a fact of life, exactly as natural climate change predicts.

It is worth noting that the only "evidence" scientists have that the earth's changing climate has been driven by rising CO₂ is based on their models' failures to simulate 20th century warming when only "known"

natural factors are considered. When increasing CO₂ is added, their models can simulate average global warming since the 1970s. But their models fail to simulate earlier oscillating weather patterns. So there is a high likelihood climate models have failed to incorporate some critical natural factors affecting climate change.

For example, the natural Pacific Decadal Oscillation results in 20- to 30-year periods of more frequent El Niños, which alternate with periods of more La Niñas. The negative phase of the PDO amplifies the impacts of La Niña droughts and increases the risk of fires from California to the Colorado Rockies to the Southeast. Yet the PDO was not even named until 1997 and is still not accurately incorporated into global climate models.

In 2014, the scientist who discovered the PDO co-authored a research paper demonstrating how it explained observed climate swings along much of North America's West Coast. The impact of the PDO was highly significant, but contributions from greenhouse gases were insignificant.

As illustrated on the previous page in a graph highlighted in a past National Climate Assessment, CO₂-driven climate models failed to replicate the extent and severity of observed droughts since 1900. The number on the left axis represents the proportion of the United States and Mexico that was in drought. The red and black lines represent actual observations. During the Dust Bowl years, 20 to 35 percent of the United States and Mexico were in extreme drought. Gray lines represent the scatter of individual models. The blue line represents averaged model results, which project that as CO₂ rises, we'll experience growing widespread catastrophic droughts in the 21st century. That catastrophic projection is what the media hypes. But should we trust dire future predictions from models that totally failed to simulate the extreme droughts of the 20th century? Would you trust a doctor's diagnosis if he failed to correctly diagnose his previous patients? ■

Jim Steele is an ecologist who served as director of San Francisco State University's Sierra Nevada Field Campus from 1984 to 2010, was principal investigator of the U.S. Forest Service's Neotropical Migratory Bird Monitoring in Riparian Habitats on the Tahoe National Forest in California from 1991 to 2010, and initiated the partnership for the Carman Valley Watershed Restoration Project. He is also the author of "Landscapes and Cycles: An Environmentalist's Journey to Climate Skepticism."