Data Shows Climate Change Fuels Spread of Wildfires Across Country

Greenhouse Gases And Failed Policies Amplify the Risks

By KENDRA PIERRE-LOUIS and NADJA POPOVICH

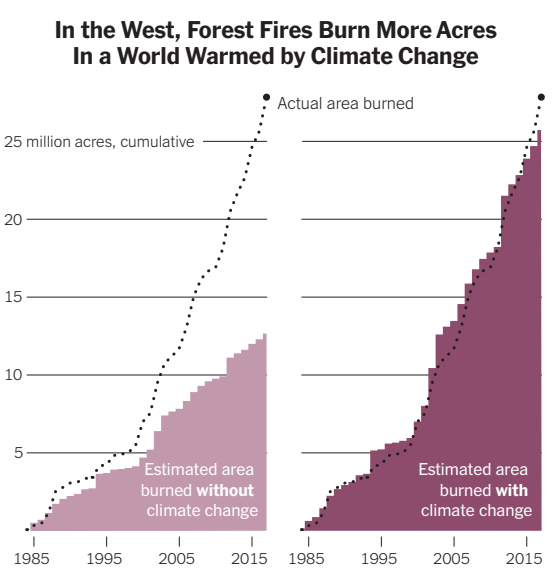
A warmer world makes for a more combustible country. That's the conclusion in the most comprehensive assessment of the effects of climate change on the United States, released by the Trump administration just weeks after the deadliest and most destructive wildfire in California history.

The report says the continued release of greenhouse gases from cars, factories and other sources will make fires more frequent, including very large fires that burn more than 12,400 acres. And wildfire risk in the United States won't just be a Western problem.

"One of the big warnings there is about the potential for increased fire in the southeast," said Andrew Light, a contributor to the report and a senior fellow at the World Resources Institute.

JIM WILSON/THE NEW YORK TIMES

Paradise, Calif., after the Camp Fire. Wildfires like this, common out West, may be more common.



Source: Proceedings of the National Academy of Sciences
Data updated through 2017 by A. Park Williams

THE NEW YORK TIMES

More Land Burned

Human-caused warming has increased the area burned by wildfire in the Western United States, according to the report, "particularly by drying forests and making them more susceptible to burning."

A recent study cited by the report estimated the total acres burned in western forests under current climate conditions and in a model without human-caused warming. It found that half as much forest area would have burned between 1984 and 2015 in a world not warmed by climate change.

Climate change is not the only factor determining the size and destructiveness of a fire. Humans are increasingly intruding into wildland areas to build communities, increasing both the likelihood of fires and their devastation. Historical wildland management that focused on fire suppression has created some areas that are ripe for burning.

"Wildfire is an essential part of many forest ecosystems, but two major factors have produced the catastrophic fires we're seeing in the western U.S. — old policies and human-caused climate change," said Patrick Gonzalez, a forest ecologist at the University of California, Berkeley and a contributor to the climate report.

There is evidence "that area burned is more closely related to climate," Dr. Gonzalez said.

Fires in Unlikely Places

The report notes that warmer winters in the Northwest have reduced snowpack, the thick layers of snow that would form in the mountains over winter and melt through spring and summer. The decline in snowpack has decreased the amount of water available in summer, increasing wildfire risk.

Forest fires in the region "are expected to increase as temperatures increase and as summer droughts deepen," the report says.

Warmer temperatures and drought are also expected to increase wildfires in the Southeast, which already experiences more billion dollar disasters than any other region in the United States.

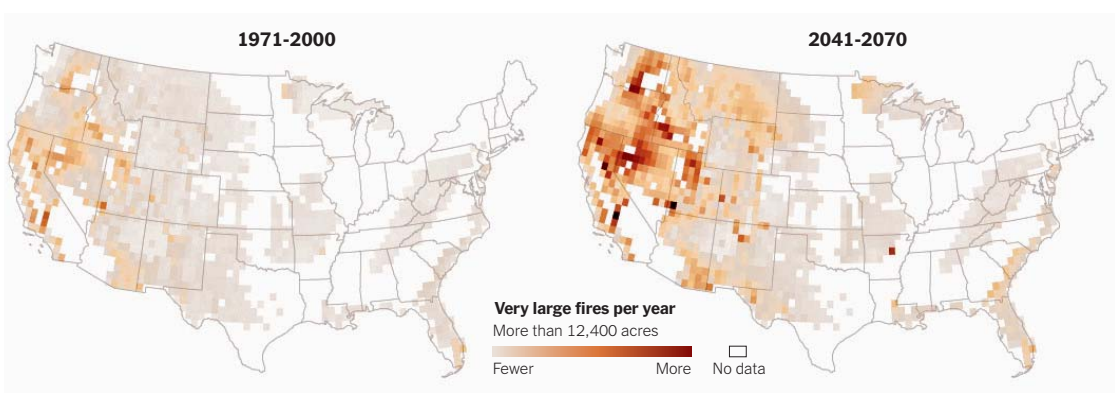
A Source of Emissions

Extreme wildfires are not only a consequence of climate change, they also can contribute to the rise in carbon emissions. "Two-thirds of the carbon emitted by California ecosystems from 2001 to 2010 came from six percent of the land area that burned," said Dr. Gonzalez, referring to his published research.

Dr. Gonzalez said the result was that California's ecosystem, including its grasslands and forests, actually emitted more greenhouse gases than it took in, becoming a net contributor to the planet's warming.

And increasingly, there's concern about what happens after a fire strikes. Over the past 15 or 20 years, the number of forests rebounding after a wildfire has declined.

"There's questions about what's going to come back where that fire burned through," said John Abatzoglou, an associate professor in the Department of Geography at the University of Idaho. "Is it not going to regenerate as a forest? Are we going to see more grassland and shrublands?"



Source: International Journal of Wildland Fire

THE NEW YORK TIMES

Interior Leader Is Cleared In Utah Monument Inquiry

By LISA FRIEDMAN

WASHINGTON — A government watchdog agency has cleared Interior Secretary Ryan Zinke of wrongdoing following a probe into whether he redrew the boundaries of a national monument in Utah to avoid the nearby land holdings of a Republican state lawmaker and supporter of President Donald Trump.

The Interior Department's inspector general, Mary Kendall, found "no evidence" that Mr. Zinke gave Utah State Representative Michael E. Noel preferential treatment when the agency last year shrank the size of Grand Staircase-Escalante National Monument in a way that excluded a parcel of land owned by Mr. Noel.

Investigators concluded there was also no evidence that Mr. Zinke or other Interior staff "were aware of Mr. Noel's financial interest in the revised boundaries, or that they gave Noel any preferential treatment in the resulting proposed boundaries," according to a November 21 letter Ms. Kendall wrote to David Bernhardt, the deputy secretary of the Interior.

Mr. Zinke is the chief architect of a number of President Trump's environmental regulatory rollbacks. Several investigations into his behavior at the agency are still pending, and he also faces a possible Department of Justice inquiry into his involvement in a land deal in Whitefish, Mont., linked to the energy giant Halliburton.

Mr. Zinke's spokeswoman, Heather Swift, did not respond to requests for comment about the national monument investigation.

Mr. Noel, reached by phone in Utah on Tuesday, said he felt vindicated. He called the investigation, requested by the Western Values Project, an environmental watchdog group, "pretty spurious" and said he spent more than two hours speaking with federal investigators who traveled to Utah to interview him.

The Associated Press earlier reported on the inspector general's findings.

The Western Values Project had claimed that Mr. Noel — who had toured the Grand Staircase-Escalante National Monument with Mr. Zinke during a review last year of the boundaries — failed to properly disclose that he owned 40 acres of land within the monument. The land was ultimately removed from the monument boundaries. Mr. Noel on Tuesday said he owns thousands of acres of land in the region, adding, "There was really nothing to report because I have never talked to the secretary about any of my property."

Representative Raul Grijalva of Arizona, a Democrat who is expected to chair the House Natural Resources Committee next year, said in a statement he accepts the results of the investigation into Mr. Zinke. He also said that "the process he and President Trump used to destroy Bears Ears and Grand Staircase-Escalante will be front and center in our oversight and investigations efforts" when Democrats formally take control of the House.

Chris Saeger, director of the Western Values Project, criticized the Interior Department for not releasing the full investigative report.

ERIC THAYER/REUTERS

Ryan Zinke, the secretary of the Interior Department, is still facing several investigations into his behavior at the agency.

Pollution Takes Long-Term Economic Toll

By AUSTIN FRAKT

One argument for rolling back environmental regulations — as is occurring under the Trump administration — is that a lighter touch on industry will lift investment and economic growth.

But increased pollution can also have long-term negative economic consequences. The effects on health are bad enough on their own, and are well understood.

- Particulate matter — a significant recent concern in California because of wildfires — as well as sulfur dioxide, nitrogen dioxide and ozone can aggravate people's airways, degrade lung function and worsen asthma.
- Carbon monoxide can cause problems for people with some types of heart disease and, at very high levels (usually indoors), can lead to dizziness, confusion, unconsciousness and death.
- Lead can cause cardiovascular and neurological problems. Pollution to groundwater from industrial waste can also harm health.

Less well understood is how this can affect things like educational and economic outcomes. Many studies, some focused on regions of the United States, others on cities elsewhere, have documented this kind of relationship: It's harder to perform well at work or school if you don't feel well. Additionally, if school performance suffers as a result of health problems, that threatens long-term work and earnings prospects.

Children are especially vulnerable to the effects of pollution. The fetal origins hypothesis posits that environmental conditions before birth can affect development, health and well-being. Daniel Prinz, a Harvard Ph.D. candidate, is an author of a recent paper on the subject. "The evidence is overwhelming that pollutants encountered in utero can cause long-term harm," Mr. Prinz said. (I was a co-author on this paper, along with two Harvard health economists, David Cutler and Michael Chernew.)

The 1970 amendment to the Clean Air Act significantly reduced air pollution in certain areas, offering a research opportunity. A study published last year in the Journal of Political Economy looked at the level of pollution experienced by children born in each year between 1969 and 1974, and also their earnings 30 or more years later.

WALTER HINICK/THE MONTANA STANDARD, VIA ASSOCIATED PRESS

Berkeley Pit in Butte, Mont., so polluted that it has become something of a tourist attraction.

The study found that exposure to lower levels of pollution in their birth years led to higher earnings by age 30 and at least $4,300 more over their lifetimes, or $6.5 billion per affected cohort.

Another study, by authors from Northwestern and the University of Florida, examined the test scores of 13,000 children born in Florida between 1994 and 2002, when the E.P.A. cleaned up many Superfund sites.

The children were all in families with one child born before and one after a nearby Superfund site cleanup. That meant one child was exposed, in utero, to a higher level of environmental toxicity than the other. The study found that children conceived within two miles of a Superfund site before it was cleaned up had lower elementary school standardized test scores than the siblings born later. They were also 40 percent more likely to repeat a grade; 6.6 percentage points more likely to be suspended from school; and 10 percentage points more likely to be diagnosed with a cognitive disability.

But it doesn't take decades to see pollution's effect. One study of the 39 largest school districts in Texas found that when carbon monoxide levels were higher, children were more likely to be absent from school. Janet Currie, a Princeton economist, was an author of the study.

"Pollution harms everyone," she said. "But kids are hit the hardest. Pollution impacts kids' health in the short and long term, and ultimately translates into poorer labor market outcomes — lower productivity at work and lower incomes."

Another study examined the effects of carbon monoxide and particulate matter on Israeli students' performance on high school exit exams that were required for college admissions. It found worse performance when pollution was greater. Scores on tests administered on one of the days ranked in the top 5 percent in carbon monoxide pollution were about 14 percent lower than average, for example.

The quantity of work produced by people can degrade at higher levels of pollution. A study found that higher concentrations of fine particulate matter depressed the productivity of pear packers in Northern California. In another study, the same authors found that when pollution was higher, Chinese call center workers took more breaks.

Pollution may also affect the quality of work, which is much harder to measure. An intriguing study in the Journal of the Association of Environmental and Resource Economists got at this issue by examining how accurately baseball umpires called balls and strikes under different pollution conditions.

Since 2008, pitch calls have been checked by Major League Baseball with an electronic system. In a typical game, an umpire makes 140 ball/strike calls. When there was a 150 percent increase over average carbon monoxide levels or the same increase in small particulate matter, the study found an average of 1.4 additional incorrect calls. Levels of pollution that high occur in about one in 10 games.

Over the very long term, economic growth has been a boon to health and longevity. But when that growth is achieved through increased pollution, that can harm both health as well as longer-term economic prospects. And pollution from large-scale environmental events like the California fires may also challenge productivity at school and work, even for children only now in utero.