

CLIMATE

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NEWS ANALYSIS

Humans Are Making Hurricanes Worse. Here's How.



By **John Schwartz**

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When hurricane Florence struck the Carolinas last week, humanity played a role in the destruction.

Human intervention is making natural disasters unnaturally harmful, both in causes and effects, and the number of ways our own influence is making things worse, taken together, is sobering.

On a global scale, we are bolstering the destructive potential of hurricanes and other extreme weather events by driving climate change. At the local level, we remain reluctant to deal with the problems of our own making, building and rebuilding in risky areas even as we avoid the policies and investment that would help mitigate the threats.

Kim Cobb, a climate scientist at the Georgia Institute of Technology, said that people tended to think of climate change as an abstract problem with only technocratic solutions. But it is getting more concrete all the time, and requires real-life action in response.

“This year has shown us that climate change is a present-day threat to the safety and livelihoods of communities across America,” she said. “Some communities are tackling these issues head on, but some have their heads in the sand.”

‘Human interference’ is making hurricanes more destructive

The human contribution to heating up the planet by burning fossil fuels is already nudging up the destructiveness of hurricanes like Florence and last year's Hurricane Harvey in some ways, and will have even greater effects over time: "Climate change is expected to make intense hurricanes more intense," said Andrew Dessler, a climate expert at Texas A&M University.

The consequences of human-driven climate change on hurricanes plays out in a number of ways. Hurricanes get energy from warm ocean water, and the oceans are heating up. (The waters Florence encountered were, in fact, warmer than normal.) Compounding the problem, warmer air can hold more moisture, which can lead to the kinds of intense rain events and high levels of inland flooding associated with storms like Florence.

On top of that, Dr. Dessler said, sea levels have already risen because of global warming, and those heightened sea levels make storm surge levels higher, pushing more water onto land and creating even more flooding.

Other research suggests that climate change is weakening the atmospheric currents that tend to move weather systems along during the summer months. That makes storms like Harvey and Florence stall while they dump stunning amounts of water over the landscape, so that even a storm without catastrophically powerful winds can do tremendous damage, even far inland.

Researchers working in the field of attribution science, which searches for possible links to climate in individual weather events, have suggested that Hurricane Harvey's rainfall was 38 percent higher over what would have been expected in a world without climate change.

That branch of science is evolving, and speeding up: Researchers led by Prof. Kevin A. Reed of Stony Brook University published a prospective look at the effects of climate change on Hurricane Florence as it neared landfall last week. They estimated that the storm's heaviest rainfall would be 50 percent greater, and the size of the storm some 50 miles wider, because of the human interference in the climate system."

Politics and policies put people in harm's way

Damage from such powerful storms is becoming increasingly expensive. Costs in the United States could increase by \$23 billion per year by the middle of this century if steps aren't taken to adapt coastal communities, the Government Accountability Office warned in a recent report.

Yet the Federal Emergency Management Agency, which leads recovery efforts and pays insured homeowners for their flood damage, primarily uses historical records in mapping flood risk, a system that underestimates the risk to come because of the accelerating nature of climate change.

After disaster strikes, federal policies favor paying people to rebuild in place rather than helping them relocate to safer ground. The Natural Resources Defense Council, an environmental group, has called that tendency "flood, rebuild, repeat," citing \$5.5 billion spent between 1978 and 2015 to repair or rebuild more than 30,000 properties that had already flooded multiple times.

And Americans keep moving to the coasts. The population of the Atlantic and Gulf Coast regions jumped from 52 million in 2000 to nearly 60 million in 2016, according to the Census Bureau. In flood-prone areas, rapid development often means paving over much of the landscape that might absorb floodwaters, which was certainly a factor in the Houston area when Harvey came.



Flooding in Orange, Tex., after Hurricane Harvey dumped record amounts of rain on the Houston area in August 2017. Gerald Herbert/Associated Press

Our propensity to engage in poor planning is not newly discovered. The geographer Gilbert F. White, known as the father of floodplain management, wrote in 1942 that “floods are ‘acts of God,’ but flood losses are largely acts of man.” That means that any steps we take to avoid building in places with flood risk should minimize the cost of disasters.

Russel L. Honoré, the retired Army lieutenant general whom President George W. Bush placed in charge of Hurricane Katrina recovery efforts after initial stumbles, has more blunt advice in the title of his new book: “Don’t Get Stuck on Stupid.”

“If you live on a street named River Road,” he said in an interview, your home “is going to flood.” But the problems stem not only from personal choices but also from a lack of national will to make things better, he said.

Far from fighting, mitigating or adapting to global warming, the federal government is rolling back Obama-era climate policies. President Trump, who has called climate change a hoax, is withdrawing the United States from the Paris Agreement, the world's biggest climate pact. He says that regulations designed to combat climate change are a drag on the economy.

When governments do act, it is often after disaster has already struck. New Orleans got \$20 billion in new hurricane protection from federal, state and local sources, but only after damage from Katrina cost the region some \$135 billion.

This year, voters in Harris County, Tex., which includes Houston, passed a \$2.5 billion bond measure after Harvey to better protect the area from future storms and to buy out homes in some of the riskiest areas.

Humans have a hard time planning ahead

Jim Blackburn, a professor of environmental law at Rice University in Houston, said that the bond measure was a start, but that attitudes had not changed enough after years of sprawling development and inadequate flood planning.

He recalled that after Hurricane Ike struck the Texas coast in 2008, FEMA paid for signs in the community of Clear Lake, near Houston, that were intended to tell homeowners how high surge waters from a major storm would rise there. Local officials, besieged with complaints from residents and real estate agents, took the signs down.

“The bottom line is we really don't want to deal with this problem yet,” Mr. Blackburn said. “We're more interested in selling houses than we are in taking care of people.”

What explains the lack of action to stave off climate change at the global level and to address issues of resilience and adaptation at the local level? Katharine Hayhoe, a climate scientist at Texas Tech University, suggested it goes back to a fundamental human flaw.

Long-range planning is necessary to confront the threat of climate change, but “psychologically, we’re just not designed to do that,” she said. Humans are most acutely attuned to immediate threats, she added: “We are evolved to run away from the bear, not plan for long-term food supply.”

General Honoré said he uses strategies to make the problem feel more real to audiences unwilling to accept that climate change was happening. “I ask, ‘Do you know of a place you used to be able to fish, and you can’t fish any more?’ ” he said. “They all raise their hands.”

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