



Inherit the wind

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September 28, 2017

Hours after Hurricane Harvey deluged Houston with catastrophic flooding, some storm watchers blamed an unseen culprit for the storm's massive destruction: global warming.

More caustically, they heaped personal responsibility for the tragic loss of life and property on anyone skeptical that climate change caused the storm or made it so severe.

Mark Hertsgaard of *The Nation* announced: "The victims of Hurricane Harvey have a murderer—and it's not the storm." Hertsgaard blamed global warming for Harvey's severity, and he castigated anyone unsure or unwilling to take drastic measures to combat climate change: "Murder is murder, whether the murderers admit it or not."

After Harvey's landfall, journalist Brian Merchant wrote, "Climate change denial should be a crime." (Merchant even identified a section of the Texas penal code on "gross negligence" as a way to punish government officials skeptical of global warming's effects.)

After Hurricane Irma plowed into Florida two weeks later, a *Washington Post* editorial penned by three scientists declared: "Irma and Harvey should kill any doubt that climate change is real." Even Pope Francis claimed the hurricanes proved the effects of climate change and warned, "If we do not turn back, we will go down."

Others weren't so sure. Some say the science isn't clear about whether climate change causes hurricanes or makes them worse. And commonsense preparations and tangible improvements to infrastructure remain the first line of defense against hurricanes and other disasters no man ultimately can control.

Indeed, even as Harvey made landfall in August, officials at the National Oceanic and Atmospheric Administration (NOAA) wrote, "It is premature to conclude that human activities—and particularly greenhouse gas emissions that cause global warming—have already had a detectable impact on Atlantic hurricane or global tropical cyclone activity."

NOAA wasn't denying the earth is warming: It was simply reporting that scientific data don't support the notion that global warming caused the severe storms we've seen this hurricane season.

It's an important distinction in a contentious debate: It's possible to acknowledge the climate is changing without being convinced the results would be catastrophic or that our response should be apocalyptic.

It's also a timely discussion: As President Donald Trump considers whether to remain in the Paris climate accord, climate change activists use hurricanes as leverage to warn of disastrous consequences if the United States doesn't commit to spending billions of more dollars on combating the possible effects of global warming around the world.

History reminds us that severe storms devastated some of the same spots walloped by Harvey, Irma, and Maria—long before man-made climate change could have been the culprit. As debates continue over climate change, how can Christians prepare to be good stewards—and good neighbors to those who will most need our help in the storms or other disasters yet to come?

NEIL FRANK KNOWS the history of storms. He's watched them professionally for more than half a century.

The retired meteorologist worked at the National Hurricane Center in Florida for 25 years and served as director of the center from 1974 to 1987. After moving to Texas, he worked as a meteorologist in Houston until his retirement in 2008.

These days, he's a fellow for the Cornwall Alliance—a network of Christian scholars and scientists—and he still gets calls from news stations when big hurricanes roll in. Frank watched Harvey's deluge safely from his perch at home about 40 miles outside of Houston.

When Frank, 86, compares Harvey and Irma to past hurricanes, he rattles off storms and corresponding years with ease. He likes to start with 1886: That's the most active hurricane season on record in the United States, according to NOAA, with seven hurricanes making landfall, including one that wiped out Indianola, Texas.

In 1893, another hurricane hit Louisiana, killing as many as 2,000 people. In 1900, an infamous Category 4 hurricane swamped Galveston, Texas, and killed at least 6,000 people in the booming coastal town.

The year 1935 brought a Category 5 hurricane to the Florida Keys, knocking a train of departing workers off a set of railroad tracks. During the same year, another storm caused massive flooding in Houston, submerging swaths of downtown and closing the city's port for eight months.

Frank, who doesn't think data shows global warming is making hurricanes more frequent or fierce, notes that all these storms struck before the major emissions of carbon dioxide that some modern scientists say contribute to similar storms today: "There were no SUVs in 1935."

Fierce storms continued, and the Houston area endured another round of flooding with Tropical Storm Claudette in 1979. The storm stalled out near the city—much like Hurricane Harvey this year—and it dumped some 43 inches of rain in 24 hours—approaching Harvey's recent rainfall.

After Hurricanes Katrina and Rita rocked the Gulf Coast in 2005, climate activists warned more megastorms were sure to follow soon. Former Vice President Al Gore predicted in 2005 that the storms were the "first sip of a bitter cup" the country would drink year after year because of global warming.

As it turned out, it would be 12 more years before another Category 3 storm would hit the United States: Hurricane Harvey made landfall in August as a Category 4.

Roger Pielke, a professor at the University of Colorado at Boulder, notes that since 1970, the United States has seen only four hurricanes ranked Category 4 or 5 make landfall. In the 47 years before that, he says, the country endured 14 such storms.

Given the history, he warns against using Harvey and Irma as a form of "single-issue myopia" to make the case for drastic measures toward combating climate change.

Ryan Maue, a Florida-based research meteorologist, also warns against overreaction. His research—included in a recent Intergovernmental Panel on Climate Change report—found that during the last 50 years, tropical storms and hurricanes did not show an upward trend in frequency.

What about intensity?

Some scientists and climate change activists say global warming may not cause individual storms, but they maintain that warmer conditions may make storms more severe. Maue notes that climate models predict over the next half century the world will see fewer but stronger storms.

The key word is *predict*: As Cato Institute scholar Patrick Michaels points out, given the variability in hurricanes each year, it could take a half century to determine whether the models are correct.

None of this means more megastorms won't hit the United States.

In a *Wall Street Journal* op-ed, Pielke, the Colorado scientist, wrote that history suggests we'll experience more storms in the future, whatever one believes or doesn't believe about climate change: "Because the world has experienced a remarkable period of good fortune when it comes

to catastrophes, we are due.” (What some call good fortune, others know as God’s mercy.) The question then becomes: Where should we put scarce resources when preparing for future disasters?

Fully implementing the Paris accord (aimed at reducing global greenhouse gas emissions) could cost tens of trillions of dollars over the next 50 years. (Under President Barack Obama, the United States already pledged \$3 billion to the fund, and President Trump is considering whether the United States should pull out of the agreement or renegotiate the terms.)

What would the accord achieve? Cal Beisner of the Cornwall Alliance has said the most optimistic outcome would lead to 0.3 degrees Fahrenheit of cooling: “It won’t save human lives.”

WHAT WOULD SAVE LIVES?

Global warming’s effects on storms may be debatable, but most of the at least 50 deaths in Florida after Hurricane Irma came from clear-cut causes: In many cases, the loss of electricity.

Authorities reported at least 11 people died from carbon monoxide poisoning, often caused by inhaling noxious fumes from running a generator during a loss of power.

Eight residents of a Miami nursing home died from heat-related causes shortly after the storm knocked out a transformer that powered the center’s air-conditioning unit. Three other residents died later. Authorities are investigating whether the staff could have done more to save the residents’ lives.

As other nursing homes and retirement centers struggled without power in a state where some 20 percent of the population is elderly, some staff members tried to keep residents cool with ice pops and cold compresses. Florida’s massive power outage left nearly half the state without service for days, with workers toiling around the clock to repair many aboveground lines.

Roger Anderson, a senior research scientist at the Center for Computational Learning Systems at Columbia University, says the power grid is an important place to start in preparing for future disasters. In a commentary for CNN, he noted 60 percent of Florida’s power grid is above ground, which led to considerable damage and outages during Irma’s wind gusts.

Since Hurricane Irma is one reminder of how easily a power outage could cripple a large population, Anderson suggests moving power to critical infrastructure underground in Florida and elsewhere: “While we cannot prevent every blackout, we can certainly speed up repair time and better deal with inclement weather (and terrorism) by putting these wires underground.”

It's certainly an expensive prospect: Florida Power & Light Co. gives a broad estimate for the costs: anywhere from \$500,000 to \$4 million per mile. But selecting areas with vulnerable populations or critical infrastructure could be a first step.

Other coastal communities might discuss whether to build higher seawalls—an effort Galveston successfully undertook after a hurricane in 1900 killed thousands there.

More-complicated systems to divert water in the case of flooding are far more expensive. Houston has discussed developing a more complex system for years, but costs have been prohibitive. (The dilemma raises an even tougher question: Should residents build again in flood zones at all?)

Finding practical ways to prepare for storms is particularly important for vulnerable populations that can't or won't leave. For example, major hurricanes bring excruciating decisions about whether to evacuate ailing residents from nursing homes. There are no easy answers.

At least 80 people died in New Orleans nursing homes during Hurricane Katrina's flooding in 2005. A month later, 24 residents from a nursing home in Houston died in a bus fire while they tried to evacuate ahead of Hurricane Rita.

A 2011 study led by a professor of medicine at Brown University found evacuating nursing home patients during emergencies later led to a higher rate of death and hospitalization than during normal periods. (Reasons vary from a higher likelihood of injury to developing potentially serious illnesses like pneumonia.)

Nursing homes in Florida are required by state law to maintain emergency plans, generators, food, and water. But under the best of circumstances and care, it's still a precarious decision and task. (And decisions must be made well ahead of storms' landfalls in order to give staff time to evacuate fragile groups of people on already-packed roads.)

Plenty of other elderly residents live alone. For them, dangerous storms can be especially treacherous if they aren't connected to a wider community. Senior care services offer critical advice to these residents: Make yourself known to others.

That's also an especially pressing task for churches.

David Acton of Christ Fellowship Miami said his church had gone door-to-door in nearby neighborhoods to check on vulnerable residents after Irma. That includes low-income areas where families may have lost critical food supplies during power outages. The church members distributed food boxes and made sure neighbors were OK.

But that's groundwork the church laid far ahead of the storm. Acton says the congregation has developed relationships with retirement communities, local schools, and low-income areas over a

span of years through service projects and simple outreach programs. It's allowed them to know where to find those in need and has established trust with those that need help.

Acton says it's something any church—large or small—should consider doing well before any disaster strikes. It's a means of ongoing outreach, but it's also a way to make sure they know they're cared for: "We want them to know that neither God nor the church has forgotten them."