

National

# People love to live in places that are at risk for disasters, ‘and this is what happens’

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By **Joel Achenbach** and **Mark Berman** October 15, 2017

California was burning and emergency management officials in Sacramento were listing the latest statistics about the fires, the firefighters, the acres burned, the fatalities, the missing people, the number of tanker planes and helicopters deployed, and so on. To one side, in a suit and tie, stood the governor, Jerry Brown.

When he took the microphone, he offered the long view of this extraordinary year of natural disasters in the United States.

“It’s just part of the facts of a highly developed society, is that you have a lot of people and a lot of assets in the face of floods and hurricane and fires,” Brown (D) said at the Wednesday briefing. “And this is what happens.”

That might have sounded detached and cerebral while in the middle of a crisis, but it’s what everyone in the emergency management business knows to be true. As a people, we are consistently stepping into the path of destruction. “Natural” disasters have a heavily engineered element.

Recent months have delivered a steady pounding of misery, as flooding drowned Houston, hurricanes chewed through Florida, the U.S. Virgin Islands and Puerto Rico, and wildfires killed dozens of people in California. If it feels like these things are getting worse, experts say that’s because, in some cases, they are.

There are more people and property vulnerable to natural forces. And climate change doesn’t help. Scientists know that global warming does not create a specific hurricane or a wildfire, but climate change, which has been driven significantly by the burning of fossil fuels, primes the pump for extreme weather.

A warmer atmosphere can hold more moisture and produce heavier deluges. On a hotter planet, droughts can be, and have been, more severe. Coastal flooding gets worse as seas rise.

The wildfire season has gotten longer in recent years, and the wildfires are bigger, said Shawna Legarza, director of Fire and Aviation Management for the U.S. Forest Service.

“We’re seeing intense periods of longer, hotter summers,” she said. “We saw that this summer in Montana where it didn’t rain for 60 days.”

Kerry Emanuel, a professor of meteorology at the Massachusetts Institute of Technology, said the kind of torrential rains that flooded Houston are far more likely than they were a generation ago.

“The underlying probability of a [Hurricane] Harvey-like rainfall in Texas was maybe 1 percent annual probability in 1990 and is 6 percent probability today because of climate change,” Emanuel said.

The recent U.S. events have been catastrophic but hardly unimaginable. Engineers have long warned of the flood risks in Houston, which flooded in 2015 and 2016.

Florida, meanwhile, has historically been a magnet for hurricanes, getting hit by more than any other state between 1851 and 2015, according to the National Oceanic and Atmospheric Administration. Florida’s population has quadrupled in half a century, to more than 20 million. At one point in September, the entire Florida peninsula was under a hurricane warning from Irma, which traveled up the state as if trying to drive up Interstate 75 and affected almost every one of Florida’s major population centers.

Florida’s booming coastal population might create its own herd mentality of collective safety rather than vulnerability. And psychologists say it’s human nature to avoid thinking about natural disasters.

“Most of us evaluate risk based on our gut feelings,” said Paul Slovic, a psychology professor at the University of Oregon. When we rank potential threats, “natural hazards tend to be relatively low considering the amount of damage that they pose and their frequency.”

Disasters such as wildfires, hurricanes and floods have been around forever, so we’re familiar with them, he said. People tend to be worried about new, unfamiliar threats, he said — such as terrorism and the kind of mass shooting that took scores of lives in Las Vegas.

“Mother Nature isn’t malicious,” Slovic said. “We don’t feel she is out to get us, whereas a terrorist is out to harm us, just for the pure hatred, desire to harm.”

Some hazards have only recently been grasped by the scientific community. Researchers in the Pacific Northwest have discovered that every few hundred years, an offshore fault known as the Cascadia Subduction Zone ruptures in a manner that creates not only a powerful earthquake but also a devastating tsunami.

The odds of an 8-magnitude earthquake or stronger somewhere in the Cascadia region are between 30 and 40 percent during the next half-century, said Chris Goldfinger, a paleoseismologist at Oregon State University. This year’s rash of hurricanes or flooding might seem unprecedented, Goldfinger said, but such things have happened thousands of times before, back when there weren’t any humans around to record them.

“Wherever we are in time, we’re always between things most of the time, until your number comes up,” he said.

Science and technology can limit the hazards that develop whenever that number comes up. For example, satellites monitor weather patterns in a way impossible 50 years ago — and people have more time to evacuate before a hurricane. Scientists such as Goldfinger can study prehistoric earthquakes and improve the nation’s seismic hazard maps.

The Internet and smartphones give people instant access to emergency information. Facebook and other social media platforms helped organize rescues when intense flooding struck Houston. Police and fire officials can send out alerts to tell people to flee or take shelter from a shooter.

There is an extensive disaster-management community that preaches the virtues of mitigation — essentially, planning ahead, making preparations, strengthening defenses, improving building codes.

But mitigation is often a budget line that gets scratched out during recessions or when a community or government agency is facing a fiscal crunch. The Forest Service repeatedly has exceeded its budget for firefighting and has had to dip into funds intended for fire risk reduction and other forest management programs.

What’s unfolding nationally is a race between vulnerability and preparedness.

“It seems to me like we’re losing,” said Ken Hudnut, science adviser for risk reduction at the U.S. Geological Survey. “It seems to me like we’re not figuring out strategies and implementing them rapidly enough to keep pace with all of the change that we are observing.”

Carol Friedland, an associate professor of construction management at Louisiana State University, echoes that view: “I do not believe we’re keeping pace with what we’re facing from nature.”

She noted that Louisiana’s flood maps do not factor in land subsidence or sea level rise.

“Our elevations are lowering. And while sea level rise, at least down here, can be a controversial topic, everybody knows our land is sinking,” she said.

Much of the country is settled around coastlines, in part because historically, before the age of railroads and airlines and interstate highways, people and cargo tended to travel by water and societies built up around ports. Those coastal cities are now exposed to storms and the threat of sea level rise. Moreover, port cities often have a great deal of reclaimed land, created with dredged material, and that can be shaky ground — as seen in the Marina District of San Francisco, which was heavily damaged by the 1989 Loma Prieta earthquake.

Human nature often doesn’t help: People like a view of the ocean. And as the governor of California pointed out last week, people like being close to green places that are full of wildfire fuel.

According to researchers at the University of Wisconsin, in the Lower 48 in 1990 there were 30.8 million homes in the wildland-urban interface, or WUI. That's pronounced "WOO-ee" by researchers. The number increased to 43.4 million by 2010. California added 1.1 million of those homes.

The University of Wisconsin researchers last week studied three of the big California wildfires and compared them with the WUI database. Two wildfires, the Atlas and Adobe, fit the usual pattern: The overwhelming majority of the homes (upward of 80 percent) within the fire perimeter were classified as being in the wildland-urban interface.

But the Tubbs fire that devastated Santa Rosa was an anomaly. About 71 percent of the homes in the Tubbs fire perimeter were classified as being in the WUI, but most of the rest of the homes were in solidly urban neighborhoods. That includes homes in Coffey Park, a neighborhood tucked behind six-lane Highway 101.

The extreme winds showed how a wildfire can invade an urban area. Embers can be blown more than a mile from a hot fire. Then, when some homes in Coffey Park ignited, they became fuel for the urban fire, said Pam Leschak, a program manager for the Forest Service.

"People don't think of their homes as fuel for a wildfire," she said.

A 2004 analysis of fire danger in Santa Rosa described the city's location, surrounded by forested uplands, as "remarkably similar" to communities that have experienced "historic urban interface fires" in recent decades.

"In a major urban interface fire, the extensive annual grasslands in the Santa Rosa area would provide a receptive fuelbed for spotfires to occur resulting from long-range spotting in heavier fuels, rapidly expanding the fire front in more developed areas," the analysis said.

"My heart goes out to the people who lost homes, and lost friends and family. But what happened was not unforeseeable," Volker Radeloff, a professor of forest ecology and management at the University of Wisconsin, told The Washington Post. "Almost the exact same area burned in the 1960s."

That was in 1964 — the Hanley fire. It burned 52,000 acres, according to the Napa Valley Register, but destroyed only 150 structures.

There just weren't many people or homes there then. In 1960, there were 766 homes within the perimeter of the Tubbs fire, compared with 6,253 in 2010, an eightfold increase, according to University of Wisconsin researcher H. Anu Kramer.

Emergency managers talk about an "all-hazard" approach to their jobs. They say people need to be ready for whatever might happen. Calamity can come in many forms, often with no warning.

Legarza, the Forest Service official, poses simple questions for everyone.

"Are you ready?" she asks. "Do you have your bags packed?"

 **179 Comments**

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