

Scientists Warn of “Ecological Armageddon” Amid Waves of Heat and Climate Refugees

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Global Research, November 01, 2017

[Truthout](#) 30 October 2017

Theme: [Environment](#)

In-depth Report: [Climate Change](#)

Featured image: A dirt berm is maintained along the coast of Utqiagvik, the northernmost city in Alaska, in an effort to slow seawater intrusion from increasingly severe Arctic storms. (Photo: Dahr Jamail)

As the summer Arctic sea ice melts and continues to recede further, the fragile coastline resting atop thawing permafrost is made more vulnerable to the warming waters of the Arctic Ocean, and the waves are given room to grow larger by the vanishing ice.

This past August, every time I walked to the shore in Utqiagvik, the northernmost point in the US and only 1,300 miles from the North Pole, a large bulldozer was busy maintaining a large dirt barrier that perilously separated the northern edges of the village against the steadily encroaching, increasingly turbulent seas. It is a full-time job, because, as I would soon learn from the president of the Ukpeagvik Iñupiat Corporation that owns and runs a large portion of the village, the berm requires rebuilding from storms past, ongoing maintenance, and then building back up in preparation for coming storms.

One evening I walked to the coast as large sets of waves, sent from a windstorm out at sea, rolled onto and up the beach. Many of them were large enough to crash against the flanks of the 25-foot berm. As they did, the water jetted up into the air, colored dark brown from the fresh soil that had just been dumped onto the berm. As the waves pulled back into the ocean, they carried with them large clumps of fresh dirt that rolled down the beach into the shallow waters of the Chukchi Sea.

Only rows of the very top portions of older canvas bags filled with soil remained atop portions of the beach, remnants of previous attempts to stop the sea's relentless march towards the village. Soil from the newest iteration, the large berm, actively covered and rendered impotent the old barrier. In another place on the beach were the top corners of large metal tanks, rusting as they lay side by side in a row, protruding above the sand ... for now.

Where I stood, the sea was already washing directly against the manmade barrier. The first row of houses in the village was barely 15 meters from the back of the berm. Not far behind them stood government buildings, the police station, tribal offices. One hundred meters south of me along the coast, larger homes stood atop a bluff that was about five meters tall. A dirt road separated the homes from the edge of the bluff. Waves were already splashing against the bottom of the bluff, as they rolled over the tops of mostly buried sandbags.

The motor of the front-loader rumbled as it scooped up shovelfuls of dark soil from a large pile that had been carried from a gravel pit a half a kilometer inland. Black exhaust smoke billowed from the top of the front-loader as it quickly carried another load of soil to the berm

where it slowed and allowed its blade to tip down. Out tumbled another load of future seabed. Underneath it, unseen, methane was already bubbling up to further heat the atmosphere and render these efforts laughable.

Utqiagvik is one of several Indigenous villages along Alaska's north coast that have existed for thousands of years: Estimates vary, but people settled in them between 1,500 and 4,000 years ago. Now, anthropogenic climate disruption is threatening to demolish them.

[Less than two months after I left](#) Utqiagvik, residents experienced coastal flooding in and around the town, as [parts of the berm were breached by waves](#). This kind of erosion and where it will inevitably lead is a central problem for that village, among many others. In talking with a friend who is working with more than 30 other Native villages along rivers and coastlines of Alaska that are susceptible to thawing permafrost and increasingly severe Arctic storms, I learned that they will all have to be relocated. Until they relocate, the plight of these future US climate refugees will only intensify and worsen. In addition to the endangerment of residents' homes and sustenance, their culture and religious practices, which are deeply connected to the land and seas where they currently live, are threatened. And there will be no funding from the Trump administration to assist them in their survival.

We can no longer simply speak about what is happening to the planet in the future tense. And keep in mind that currently, we are "only" at 1.1°C above pre-industrial baseline temperatures.

Growing numbers of scientists have concluded we are already in the midst of the Earth's sixth mass extinction event. A [recent report showed](#) that plant and animal species, which in addition to their own intrinsic value are the very foundation of our own food supply, are as endangered as our rapidly disappearing wildlife.

"If there is one thing we cannot allow to become extinct, it is the species that provide the food that sustains each and every one of the seven billion people on our planet," Ann Tutwiler, director general of Bioversity International, which published the report [told the Guardian](#).

Meanwhile, 14 million people around the world are being made homeless due to floods and storms fueled by anthropogenic climate disruption (ACD), according to a [recent report](#).

Although, no single weather event can be attributed solely to ACD, scientists are in agreement that ACD is contributing to the severity and frequency of these phenomena.

[According to NASA](#), meanwhile, this August was the second-hottest August in the 137 years that records have been kept.

From the camp of scientists who aren't convinced that we are already in a mass extinction event comes a study that shows the Earth might be close to the "[threshold of catastrophe](#)," given that the amount of CO2 humans will emit by 2100 might be enough to trigger said mass extinction event.

Whether or not we have entered such an event yet, this month's dispatch reveals a sobering future for all the Earth's species, should ACD continue unabated.

Earth

As ACD progresses, evidence of dramatic impacts across the terrestrial sphere are becoming ever more obvious.

Likely the most devastating piece of recent news in this section concerns insects. A recent report showed that three-fourths of all flying insects in nature reserves across Germany have [disappeared in just the last 25 years](#). According to shocked scientists, this has very serious implications for all life on Earth. Scientists involved in the study told the Guardian that the planet is now “on course for ecological Armageddon.”

This data has serious implications for all agricultural landscapes.

“Insects make up about two-thirds of all life on Earth [but] there has been some kind of horrific decline,” Sussex University’s Dave Goulson, who is part of the team that generated the new study, [told the Guardian](#). “We appear to be making vast tracts of land inhospitable to most forms of life, and are currently on course for ecological Armageddon. If we lose the insects then everything is going to collapse.”

A [recently published study in the journal Science](#) sounded the alarm on the fact that Earth’s tropical forests are now so degraded that they are emitting more carbon than all of the traffic in the United States. A healthy forest sequesters carbon dioxide from the atmosphere, whereas forests that are degraded by drought, wildfires and deforestation release previously sequestered carbon.

“When I look at these numbers and the map of where the changes are occurring, it’s shocking,” Alessandro Baccini, one of the lead authors of the research team from Woods Hole Research Center and Boston University, [told the Guardian](#). “My child may not see many of the forests. At this rate of change, they will not be there.”

Adding insult to injury, NASA data collected in 2015 revealed that as the planet continues to warm, overall tropical forest CO2 emissions will skyrocket.

“Up to now, land ecosystems, mainly forests, have been mitigating part of the fossil fuel problem. They’ve been sucking CO2 out of air, about 25 percent of our fossil fuel emissions,” Colorado State University climate researcher Scott Denning [told Inside Climate News](#). “The worry is that, as the climate warms, that will stop, and that’s exactly what we saw.”

Furthermore, another [recently published 26-year study](#) showed that warming soils are now releasing much more carbon into the atmosphere than previously thought. This means another disastrous feedback loop exists that will trigger giant carbon releases in a cycle that will be impossible to stop.



Meanwhile, impacts abound.

Forests of ancient bristlecone pines are already being overwhelmed by the impacts of ACD.

Temperature and climate changes have created a [struggle for dominance](#) between the older and younger trees. The younger, limber pines are moving rapidly (for trees, that is) uphill, consuming moisture, space and nutrients that the ancient bristlecone have always relied upon.

In the wake of Hurricane Maria, the destruction wrought across Puerto Rico has seen tens of thousands of storm victims fleeing the island for the mainland US. Experts note these victims could well be considered the [latest iteration of US climate refugees](#). Other refugees will, before long, include former residents of southern Louisiana, which is melting into the sea, and residents of the shrinking islands in Alaska's Bering Strait.

Lastly in this section, out of a colony of nearly 40,000 penguins in the Antarctic, all have starved to death except for two chicks. Changing conditions due to ACD are a primary cause of the [collapse of the colony](#), which was located in one of the most remote regions on the planet.

Water

The watery realms continue to see massive changes.

In the Antarctic, the Pine Island glacier, which alone is capable of contributing nearly two feet to global sea level rise, [recently lost a massive piece of itself](#), providing scientists with another sign of its ongoing retreat. This is the second time in as many years the glacier has shed such a large portion. The glacier is already losing 45 billion tons of ice to the ocean each year.

Another recent report on the Antarctic showed that sea ice there is literally being attacked by warmer temperatures from above and below. Warming atmospheric temperatures coupled with warmer ocean waters have combined to cause Antarctic sea ice to [shrink by two million kilometers in just the last three years](#). This caused a recent swing from a record large maximum area of coverage to a record low area of coverage.

Meanwhile at the other pole, recently released data showed that the Arctic ice cap melted down to [hundreds of thousands of square miles below its average](#) this past summer. The ice minimum for this year was 610,000 square miles below the 1981-2010 average, in addition to its being the eighth-lowest year in the 38-year satellite record.

Across the globe, flooding is intensifying. Central India has seen [violent floods triple](#) since 1950, according to a recent report. Violent floods are those that cause death to humans and damage to property. This particular region of India, which is home to roughly half a billion people, is regularly hit with flash floods, landslides and torrential rains that kill thousands and displace millions, in addition to drowning livestock and crops.

Extreme flooding has taken place in Mexico, Guatemala, the Congo, Poland, Malaysia, Thailand, Indonesia and Oklahoma recently.

Meanwhile, eroding coastlines along with increasing shortages of food are becoming more common across the Pacific, [according to another recent report](#). Lack of drinking water — along with vulnerability to rising seas and increasingly extreme storms — are also growing problems across this largest geographic area of the globe.

Fire

For those living in the US, wildfires in California have been in the headlines this month. At the time of this writing, the [current death toll](#) from the Northern California wildfires is 42, and the monetary total has reached more than \$1 billion in lost and damaged property. Dozens of people remain missing, so the number of deaths is expected to increase. Entire neighborhoods, hotels and schools were burnt to the ground, as thousands had to evacuate. Nearly a quarter of a million acres burned in 13 major fires, and at least 6,700 homes, structures and wineries were destroyed.

California's [new normal](#), for now, is obviously longer and more intense wildfire seasons, ongoing droughts and ever-increasing warm temperatures. Like something out of a science fiction novel, California is en route to being one of several US states (including Florida, Alaska and Louisiana) that are poster children for ACD impacts.

In Europe, we may well be seeing another instance of how ACD is playing a role in destabilizing the government of a country — this time in Portugal. A minister in charge of emergency services there resigned after at least 106 people were killed in wildfires. The area burned by wildfires in Portugal was a stunning six times higher than the annual average for the last eight years, and was the largest area burned on record.

Air

A recently published study in the Bulletin of the American Meteorological Society showed, again, how the warming of the Arctic is actually making winters in the US colder, as exemplified by the extreme winter of 2014-2015. The following year, which brought an unusually warm winter to the mid-northerly latitudes, is another example of how the Polar Vortex, a large area of cold air and low pressure that surrounds Earth's poles, is impacting the planet. The study showed that ACD is weakening the vortex, and this was linked to many of the coldest winters over the last four decades.

ACD-fueled warmer temperatures, both in the atmosphere and oceans, have been the primary driver behind this year's horrific hurricane season and extreme weather.

Puerto Rico, home to 3.4 million US citizens, continues to languish from the impact of a massive hurricane with no end in sight. Brazil just experienced its [hottest winter on record](#) along with an extreme dry season, while in Spain, thunderstorms that formed in a far warmer-than-normal atmosphere released an [apocalyptic half a meter of hail](#) in some areas. Thirty-five liters of water per square meter fell in just half an hour, and temperatures plummeted so suddenly that several people required treatment for hypothermia.

One-hundred-year-old warm temperature [records](#) across much of the East Coast and Midwestern US were shattered in late September when a heat wave struck these regions. In the Midwest, the National Weather Service [reported](#),

“There has never been a heat wave of this duration and magnitude this late in the season in Chicago.”

Buffalo, New York saw its latest-ever number of consecutive 90°F days, while Burlington, Vermont saw the [thermometer hit 92°F](#) on September 25th, which was the latest it had been that hot — 7 degrees higher than the previous hottest temperature. Records for the hottest day or series of hottest days this late in the year were being set, with room to spare,

in Ottawa, Canada, northern Maine, Minneapolis, Minnesota and Green Bay, Wisconsin.

A recent study [published in Nature Scientific Reports](#) found,

“Summer in some regions of the world will become one long heatwave even if global average temperatures rise only 2°C [3.6°F] above pre-industrial levels.”

In mid-October, Ireland was slammed by the remnants of Hurricane Ophelia, the [strongest ever eastern Atlantic hurricane](#). The storm knocked out power to more than 120,000 people, and left at least one person dead.

Denial and Reality

The US isn't the only country with an ACD-denialist sector of society, as [one in five Australians](#) believe, like Donald Trump, that ACD is a hoax.

Meanwhile in the US, the Trump administration is having federal agencies like FEMA and the Department of Homeland Security [use the term “resiliency” instead of climate change](#), as though that will make it go away.

Scott Pruitt, the former fossil-fuel henchman who is now head of the EPA, announced plans to [withdraw the Clean Power Plan](#) that regulates greenhouse gas emissions, while no less than [52 environmental policies are on the way out](#) as part of a Trump plan to ease burdens on the fossil fuel industry. Trump's pick to run the White House Council on Environmental Quality, Kathleen Hartnett White, believes that increasing CO₂ in the atmosphere is [good for humanity](#) and calls it “[the gas of life](#).” This should come as no surprise given that she is the senior fellow and director of the Armstrong Center for Energy and the Environment at the fossil-fuel-funded Texas Public Policy Foundation.

On the reality front, a [recent report showed](#) that more than half of US citizens want their local officials to take up the fight to mitigate ACD impacts, particularly given that Trump is stomping on the fossil fuel gas pedal. [Moreover, more than half of the US population](#) sees ACD as responsible for the severity of recent hurricanes, a universal shift from Hurricane Katrina, when 2/3 said it was just severe weather.

General Motors announced plans to, eventually, [only produce electric vehicles](#). It will release two more electric vehicles next year and another 18 by 2023.

[Paris announced plans](#) to banish all but electric cars by 2030, and last year the [Netherlands joined Norway](#) in banning the sale of new cars powered by internal-combustion engines after 2025, in addition to stipulating that all vehicles must be zero-emission by 2030.

Forty Catholic institutions around the world are [divesting from fossil fuels](#) and have urged others to follow suit.

Although the White House may be closing its eyes to ACD's impacts, the rest of the world is increasingly waking up — and not a moment too soon.

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