It's Raining in Antarctica While Trump Slashes Climate Science Funding

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This Memorial Day I awoke in a tent high on Klahhane Ridge in Washington state's Olympic National Park. With the Strait of Juan de Fuca just to the north, and a sweeping view of Mount Olympus and the rest of the park to the south, the sunset the night before went on for hours.

After the sun set, slivers of red arched across the sky in streaks on the underbellies of a few wispy clouds. That night, the stars were so bright they ran all the way down to the horizons.

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The morning sun found me crawling out of my sleeping bag early. I sat outside eating oatmeal while marveling at the majesty of the park before me. All of the high mountains, including Mount Olympus, were covered in late-spring snow, which covered everything down to 3,000 feet. The grandeur of the wild high country was augmented by the white backdrop.

The sound of rivers and waterfalls was ever-present in the background, and aside from the one

road into the park in this area, the land was unscarred. Yet all around the park, logging has left a patchwork of the forest. And now, emboldened by this particularly destructive administration, the loggers want all of these parks. And in time, I fear they will get them. Because they want everything. They are the Earth eaters.

That day I wondered, will we have a Memorial Day for all the lost, wild places? Will we have a Memorial Day for all the glaciers that used to be here?

Meanwhile, abrupt anthropogenic climate disruption (ACD) continues apace.

As President Donald Trump announced the US withdrawal from the Paris climate agreement, NOAA [National Oceanic and Atmospheric Administration] released data showing 2016 saw the biggest annual jump in atmospheric CO2 levels on record, coming in at nearly double the average pace.

NASA announced that April was the second hottest April in the history of record-keeping, and that agency, along with NOAA, released data showing that 2016 was the warmest year on record globally, making 2016 the third year in a row to set a new record for global average surface temperatures.

And the records continue to be broken. NASA data showed May to be the second hottest on record, barely trailing 2016 by one-tenth of a degree, and this was the second-warmest spring on record, again only behind 2016. The first five months of this year make it likely that this will be the second hottest year on record, again only behind last year.

Meanwhile, parts of Antarctica are literally beginning to turn green, as scientists there are finding a four- to five-fold increase in the amount of moss growth on the ice continent's northern peninsula.

Even more stunning news comes from Antarctica in a study published in the June 15 issue of the journal Nature Communications which revealed that over an area of West Antarctica, scientists were stunned to find rainfall and a melt area larger than the size of Texas in 2016.

Yes, it is now raining in Antarctica.

The New York Times published a fantastic interactive piece on the ice continent that is well worth a look, while warm temperatures last fall caused water to breach the entrance of the Arctic's "Doomsday" seed vault, one of humans' last hopes of preserving seeds to survive a global catastrophe.

Meanwhile, Arctic sea ice is disappearing off Alaskan coasts more than a month earlier than normal, and due to congressional budget cuts, the 38-year continuous US Arctic satellite monitoring program is about to end, leaving researchers in the dark about ongoing sea ice losses.

And this May, atmospheric CO2 content set an all-time monthly high when it reached 409.65ppm, according to NOAA data.

Earth

Anthropogenic climate disruption has created stunning major developments in the lives of the Earth's plants and animals over recent weeks.

A recently published paper in the journal Scientific Reports shows how ACD is disrupting the timing of dozens of songbird species. Timing is critical for migratory birds, because if they arrive too late they only get the tail end of the spring's insect supply and have trouble finding nesting spots and mates. On the other hand, if they arrive too early, they will arrive in temperatures colder than they are prepared to deal with. Yet, ACD is causing spring to arrive earlier in eastern US states and later in the west, disrupting the timing of dozens of bird species.

This is threatening the survival of many species that are currently popular in many people's backyards. "The long-term concern is that this growing mismatch can lead to population declines," Stephen Mayor, the study's primary researcher said in an interview.

An interesting thing is happening to trees in the US -- they are moving westward, and nobody seems to know why, aside from the influence of ACD, which scientists say accounts for 20 percent of the reason. One main hypothesis is that the trees are following moisture as it moves westward: The east has been getting less rain, and the great plains are getting more.

Meanwhile, a vast dieback of trees caused by a tiny beetle from southeast Asia that is on track to kill 26.8 million trees across Southern California over the next few years is expected to bring about a human death toll that could reach into the thousands. A recent report cited differences in illnesses and deaths in human populations that live near greenery versus those who do not, and is predicting these ramifications from the widespread tree dieback.

In other parts of the world, ACD-driven extreme weather events and wild temperature swings are predicted to slash major staple crop production (corn, wheat, rice, soybeans) by nearly one-quarter over the upcoming 30 years, according to another report.

In another astounding turn of events, a recently released study showed that in Greenland, so much water and ice rushed through a melting glacier that it literally warmed the Earth's crust. A mass of melting ice the size of 18,000 Empire State Buildings traveled over 15 miles through the Rink Glacier in 2012, a record melting year for the ice sheet.

Eric Rignot, a leading expert on the melting of the Greenland Ice Sheet from the University of California, Irvine, recently told Scientific American that in the Arctic, the Greenland Ice Sheet poses the single greatest risk for ocean levels due to the obvious fact that land ice that is melting, like Greenland, is the single biggest cause of rising seas, and that "most of the Arctic's land ice is locked up in Greenland." If the entire Greenland Ice Sheet melted, it would raise sea levels an average of seven meters.

And the consequences of a melting Greenland Ice sheet are far from limited to global sea level rise. A study published in the Proceedings of the National Academy of Sciences suggests that if the melting is large enough, it could literally change global weather patterns that could result in devastating crops in Africa. In sum, the massive influx of freshwater from the melting ice sheet could disrupt a major ocean current system, which would then dry out the Sahel of Africa. The consequences of this would be devastating agricultural losses as that area's climate shifts, and upwards of tens of millions of people could be forced to migrate out of the area in the worst-case scenario.

And that's not the only place major changes in melting ice are having an impact on the planet.

In Savoonga, Alaska, a village island 164 miles west of Nome in the Bering Sea, the sea ice is

arriving later and going out earlier than ever before, and with it, the walruses the natives in the village depend on. "This year it's worse. Unusual. The ice moved out in April," Larry Kava, 76, a tribal and cultural leader in Savoonga, told the Alaska Dispatch News.

Water

Not surprisingly, a recently published study in which researchers looked very closely at cities lining US coasts found that they will flood more often and more severely as ACD progresses. The study warns that cities should brace for much more flooding, from what they refer to as "nuisance" floods that cover streets at high tides, to deluges that kill people and take out vast swaths of infrastructure.

As if to underscore that point, another recent study has found that Earth's oceans are now rising three times as rapidly as they had been throughout much of the last century, showing that sea level rise acceleration is now very much under way.

At the same time, other land-based glaciers and ice fields continue to wither at ever-increasing paces. Recently released data from the USGS and Portland State University showed that ACD has dramatically reduced the size of 39 glaciers across Montana since just 1966. Some of them have been reduced by 85 percent, and on average Montana's glaciers have been reduced by 39 percent, and only 26 of the remaining glaciers are larger than 25 acres, the minimum size threshold used to decide if bodies of ice are large enough to be considered glaciers.

Seeing the writing on the wall, a team of international scientists in Bolivia called the "Ice Memory" expedition is working feverishly to transport samples of ice from a melting glacier there to Antarctica, in order to preserve and study the 18,000 years of climate history embedded within the ice before the glacier disappears completely.

Meanwhile, as oceans continue to warm, global coral bleaching continues apace.

The Australian government's primary aim of protecting the Great Barrier Reef is now no longer achievable due to the dramatic impacts of ACD, according to experts advising that country's governmental advisory committee for the plan. The reef is now likely to become listed as a World Heritage Site in Danger.

The coral bleaching event that struck the Great Barrier Reef this year was recently revealed to have had an escalating impact from north to south, killing 70 percent of all shallow-water corals north of the coastal town of Port Douglas.

Another report has gone so far as to claim that the damage already done to the Great Barrier Reef is so great that the reef is beyond repair and can no longer be saved, at least according to some scientists. This is, they said, because of the "extraordinary rapidity" of ACD, and because roughly 95 percent of the reef has been bleached since 2016.

In the US, NOAA scientists recently warned that US coral reefs are on a course to disappear within just a few decades, and the Chagos Archipelago, a small group of roughly 60 islands in the Indian Ocean, was recently found to also be devastated by ACD impacts. After back-to-back bleaching events in 2015 and 2016, scientists there found approximately 90 percent of the coral in shallow waters to already be dead.

Ocean waters in the tropics are becoming so warm that a leading fisheries expert recently

warned that fish are literally abandoning tropical waters.

Meanwhile flooding is progressing apace as extreme rain events continue to happen more frequently. In late May, Sri Lanka was seeing flooding from its most torrential rains since 2003. At least half a million people were impacted, with a death toll of at least 169 according to the Disaster Management Centre.

Another recent report revealed that three-fourths of California's native species and subspecies of salmonids (fish in the salmon family) may be extinct within 100 years, primarily due to ACD impacts and severe degradation of wild river habitats, according to biologists at the University of California, Davis, and the watershed advocacy group California Trout. In their study, "State of the Salmonids II: Fish in Hot Water," the authors warned that climate change impacts and the severe degradation of habitat of wild rivers that continues to this day could extinguish almost half of California's 32 types of native salmon and trout within 50 years.

Fire

There have been several major fires over the last month, many of which affected the US.

Southern California saw a 950-acre wildfire near Big Bear Lake. And in Utah, hundreds of people had to flee a ski town due to a rapidly spreading fire. In Arizona, more than eight structures burned as more than 100 firefighters worked to contain the wildfire amid extreme heat, hot winds and bone-dry vegetation.

In New Mexico, a volunteer fire fighter died from burns, while in Portugal raging wildfires killed at least 62, many of whom died in their cars while trying to flee to safety.

In the US, at the time of this writing, 27,943 wildfires have burned more than 2.5 million acres thus far for 2017.

Air

Methane, a greenhouse gas that is at least 20 times more potent than CO2, is already being released across much of the Arctic at far higher levels than ever recorded.

Hundreds of huge craters (some of which are half a mile wide) were recently discovered in the Arctic Ocean sea floor -- craters that formed after ice sheets melted, allowing trapped methane to blow out. One of the authors of a study on these craters described the event as being like "champagne bottles being opened" -- a phenomenon that could well happen again.

Meanwhile, examples of rapidly escalating global temperatures abound.

A recent study shows that India is now 250 percent more likely to experience deadly heat waves than it was just 50 years ago, and all it took to produce this dramatic change was increasing the average temperature there by just 0.5 Celsius.

In June, a record-breaking heat wave in the Southwestern US affected 40 million people. The heat wave was so intense it cracked pavement, threatened power grids, caused escalated risk of serious injuries and grounded flights. Temperatures reached 127 degrees Fahrenheit in Death Valley, California, the hottest June 20th ever recorded there, and Phoenix saw 119 Fahrenheit. Las Vegas tied its all-time heat record of 117 Fahrenheit (the previous time it saw that kind of heat was just four years ago), and temperature records were set across other parts

of Arizona, Nevada and California.

Forty-three flights were grounded in Phoenix when aircraft could not generate enough lift for a safe take-off in thin, low-density super-heated air. By the time of this writing, more than 50 flights had been grounded from the heat.

At one point in Arizona in June, it had never been that hot for that long, in the history of record keeping. For example, in Tucson, a record-setting seven consecutive days of intense heat saw highs above 110 Fahrenheit -- the longest streak of such heat in the city's history.

Also at the time of this writing, at least four people had died from the heat in the Southwest, with that figure expected to rise as the heat wave persisted.

A recently released study shows that one-third of the population of the planet now faces deadly heat waves due to ACD, and the number of people in danger will grow to nearly 50 percent by 2100 even if emissions are dramatically reduced before then.

And another recent report warns that ACD is pushing tropical diseases toward the Arctic Circle as the atmosphere continues to warm. This means that rare pathogens from the hotter parts of the planet are already creeping toward the north, and some of these diseases are already appearing near the Arctic.

Denial and Reality

Never a dull moment on the ACD denial front with the Trump administration.

US Energy Secretary (and scientist extraordinaire) Rick Perry said he does not believe CO2 emissions are the primary driver of Earth's warming, hence denying a core finding of ACD science. Instead of CO2 emissions driving warming, Perry claims the driver to be "the ocean waters and this environment we live in."

Trump named a BP oil disaster lawyer, Jeffrey Bossert Clark, who has also repeatedly challenged the science behind US climate policy, as the country's top Department of Justice environmental attorney. Trump's budget request to Congress will also eliminate or shrink core programs the federal government uses to track heat-trapping gases, while 85 percent of the top science jobs in Trump's government remain without a nominee, and the White House thinks the government has been spending too much money on climate science and the new budget from Trump aims to kill "crazy" climate science.

On the reality front, climate scientists are now uniting with lawyers in order to build networks to respond to attempts by the government to subvert their research and threaten them, and a recent poll shows that eight out of 10 people see ACD as a "catastrophic risk."

More news outlets are running stories asking the question of whether or not it makes sense to bring new children into an increasingly climate-disrupted world with a dystopian future that looks more inevitable by the day, and more than 1,400 cities, states and businesses in the US have vowed to meet the Paris climate commitments in the wake of Trump announcing the US withdrawal from the accords.

French President Emmanuel Macron is actively luring US climate researchers to move to France to do their work by offering four-year research grants, staff and coverage of other

expenses, and China is now looking to California Gov. Jerry Brown, not Trump, as a partner to work with in mitigating ACD.

Meanwhile, evidence of ACD becoming more abrupt continues to mount. A recently published study shows that ACD-intensified storms over the US Great Plains may well already be eroding the protective ozone layer of Earth's atmosphere, meaning that for starters, the risk of skin cancer and destruction of plants and crops is more likely.

And the final reality check comes in from another recent study that confirmed the planet is already warming 20 times faster than it did during its fastest natural climate change, which occurred when it came out of the last Ice Age.