

As Climate Disruption Advances, UN Warns: "The Future Is Happening Now"

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Global Research, May 05, 2016

Truth Out 2 May 2016

Theme: <u>Environment</u>

Each month as I write these dispatches, I shake my head in disbelief at the rapidity at which anthropogenic climate disruption (ACD) is occurring. It's as though each month I think, "It can't possibly keep happening at this incredible pace."

But it does.

By late April, the Mauna Loa Observatory, which monitors atmospheric carbon dioxide, recorded an <u>incredible daily reading</u>: 409.3 parts per million. That is a range of atmospheric carbon dioxide content that this planet has not seen for the last 15 million years, and 2016 is poised to see these levels only continue to increase.

Recently, Dr. James Hansen, a former NASA scientist and longtime whistleblower about the impending dangers of ACD, <u>published a paper</u> with several colleagues showing that ACD will push sea level rise into exponential levels by the end of this century. Their paper shows how melting is actually compounding itself, generating dramatically fast increases in both melting and sea level rise. We may well see the current three millimeter per year sea level rise grow to nearly five centimeters by 2056, and continue to increase in a nonlinear fashion.

Scientists in Antarctica are now <u>astounded</u> at the rapidity of the disintegration of the massive Antarctic ice shelves: It turns out the ice in Antarctica is far more fragile and predisposed to melting than was previously believed.

The situation is already dire enough that the conservative UN <u>warned recently</u>, "The future is happening now," and called for more urgent measures to be taken to cut global carbon emissions.

"Many people now think that the problem is solved since we reached a nice agreement in <u>Paris</u> last year ... but the negative side is that we haven't changed our behaviors," Petteri Taalas, secretary general of the World Meteorological Organization, <u>told the media recently</u>.

As if to underscore that point, March global temperatures <u>crushed</u> the 100-year-old record by the greatest margin we've seen for any month yet. February was also notably far above the long-term average, enough so that scientists described that month as a "shocker," as well as it being "a kind of climate emergency." Then, on the heels of February, the Japan Meteorological Agency <u>released data</u> showing that March was even hotter. <u>NASA data confirms this increase</u>, and also shows that March was 1.65 degrees Celsius higher than the 1951-1980 March average, while February was 1.71 degrees Celsius hotter than the February average over that time period.

<u>NASA data shows</u> that March was also the 11th straight month in a row that set a new global temperature record. According to the <u>National Oceanic and Atmospheric Administration</u>, that is the longest such streak ever recorded.

The Japan Meteorological Agency <u>also reported</u> that the first three months of this year were 1.5 degrees Celsius above preindustrial baseline levels.

Hansen had <u>warned</u> three years ago, via a study conduced by himself and several of his colleagues, that an increase of 1 degree Celsius above baseline levels was more than enough to cause "catastrophic" ACD, <u>while another paper</u> had, just one month earlier, shown that 1.5 degrees Celsius was enough to cause "a tipping point for continuous permafrost to start thawing."

While I was working in Iraq during the initial years of the US occupation there, Iraqis had a saying: "Today is better than tomorrow," in reference to how quickly things were deteriorating.

Now, clearly, the same can be said for ACD.



Recent studies have shown that the melting of ice is compounding itself, generating dramatically fast increases in both melting and sea level rise. (Photo: Marie and Alistair Knock / Flickr)

Earth

A <u>recent NASA report</u> shows how ACD is literally shifting the way the earth wobbles on its polar axis. This is caused by melting ice sheets — in Greenland, in particular — that then change earth's weight distribution, hence influencing planetary wobbling.

This fact is underscored by two more <u>recent reports</u> that show that the entire Arctic is melting much faster than previously believed. Given the increased rate of the melting of the permafrost, Arctic soils are now becoming major contributors of greenhouse gases into the atmosphere. This functions to accelerate warming, becoming yet another positive feedback loop of ACD.

Meanwhile, moose are returning to the northern Alaskan tundra for the first time since 1880. The moose hadn't been in the region since then due to overhunting, but are now returning because they once again have ample food for the harsh winter periods due to warmer and longer summers, which are allowing shrubs to grow taller.

As usual in this section of the dispatch, planetary food security is an issue. In the Philippines, the Philippine Atmospheric, Geophysical and Astronomical Services Administration <u>warned recently</u> that ACD is now a major threat to that country's food security, thanks to the way in which climate disruption has caused a far more destructive El Niño and La Niña. Worsening storms and their greater frequency are wiping out food crops on a regular basis, and this is expected to worsen.

In the United States, a <u>new federal report</u> shows how ACD is making Americans sicker, and predicts that this will worsen with time. The report shows that the negative impacts include how ACD is contaminating food and water, making the air dirtier and increasing diseases spread by ticks and mosquitos. ACD is also causing longer allergy seasons, and thousands of deaths due to intensifying heat waves.

Another <u>recent report</u> warns of how ACD is placing the world's microbiomes at risk. Microbiomes are formed by microbes within soil, which play a critical role in creating healthy ecosystems, but these systems are now being disrupted by ACD. <u>According to the report</u>, "Researchers say that as the planet warms, essential diversity and function in the microbial world could be lost."

Distressingly, a <u>recent study shows</u> that the largest group of monarch butterflies in the world, the eastern migratory population — which includes 99 percent of all monarch butterflies on the planet — could disappear within 20 years unless it rebounds in dramatic fashion. The two main drivers of the dramatically declining butterfly population are ACD and the increased use of genetically engineered corn and soybeans, which have caused declines in milkweed, the monarch caterpillar's only food source.

Water

This month, there are several shocking developments evidencing ACD's impact on water.

A recently published analysis of 65 years of winter precipitation data <u>by Climate Central</u> shows that "As the world warms, the meaning of winter is changing. In the US, a greater percentage of winter precipitation is falling as rain, with potentially severe consequences in western states where industries and cities depend on snowpack for water, and across the country wherever there is a winter sports economy." The <u>group's analysis</u> "found a decrease in the percent of precipitation falling as snow in winter months for every region of the country."

As if on cue, Houston, Texas, saw <u>record-breaking flooding</u> recently, as the fourth-largest city in the country found itself in a state of emergency after swelling waters from the deluge

claimed at least five lives. Nearly 18 inches of rain fell in one day alone, and a <u>city official</u> <u>said</u> that waters recorded in one area were a staggering 40 feet higher than the previous record.

Meanwhile, North American ski resorts are <u>scrambling to adapt</u> to ACD's impacts on their business. As they continue to see less (or sometimes, no) snow, they are increasingly offering what they refer to as "weather independent" attractions and activities, like pools, bike parks and mountain coasters.

Meanwhile, ice continues to disappear rapidly from the North American continent. According to a <u>study</u> by experts at the University of Alaska Fairbanks and other universities, the 1,500-square-mile Juneau ice field, which is the fifth-largest ice field in the Western Hemisphere, will lose more than half of its ice by 2100, and will disappear completely by 2200.

In the Arctic, for the second straight year, sea ice has reached a new <u>wintertime low record</u>. Given the record-breaking warm summer for that region, it is not out of the realm of possibility that we could see an ice-free period of Arctic sea ice either this or next summer.

A <u>recently published study</u> shows that polar bears are losing weight as the Arctic sea ice melts, since less sea ice means the bears spend more time on land not eating as opposed to hunting seals. At the same time, <u>another recent study</u> found that the melting of Arctic sea ice is forcing a dramatic increase in the number of polar bears having to swim for more than a week without rest in order to find a usable piece of ice to stand on.

In Greenland, <u>recent studies</u> warn that the rate of ice melting there is likely much faster than was previously expected, meaning that sea levels will likely be rising faster than was expected as well.

A <u>recent heat wave</u> in Greenland that brought record-setting high temperatures triggered an early beginning to the ice melt season. "It's disturbing," Peter Langen, a climate scientist at the Danish Meteorological Institute, <u>said</u> of the early, record-setting warming there. "Something like this wipes out all kinds of records, you can't help but go this could be a sign of things we're going to see more often in the future."

Greenland's capital of Nuuk <u>reached</u> 62 degrees Fahrenheit, smashing the April record high temperature by a whopping 6.5 degrees. Inland from there, at Kangerlussuaq, it was <u>64 degrees</u>, a temperature that on the same day was warmer than it was in St. Louis and San Francisco.

<u>Another report</u> warned that Canada's northern coastline is facing new challenges due to ACD, including storms, floods, erosion and melting sea ice.

The melting is happening at record levels in the Antarctic as well.

Recent modeling shows that the Western Antarctic Ice Shelf could be undergoing ice loss that would double the amount of sea level rise by 2100. The computer modeling is predicting up to three additional feet of sea level rise, and an additional nine feet should the ice shelf melt in full, which it likely will in due time.

Another <u>recent study</u> predicts that a staggering 44.7 feet of sea level rise could occur by 2500 from the melting of Antarctica's ice, in a worst-case melting scenario — that is, if nothing is done to change our current pace of emissions.

Sea level rise is already progressing rapidly enough that <u>NASA is having to consider future</u> <u>plans</u> for where to launch space vehicles, as its two largest launch pads at the Kennedy Space Center in Florida are under threat from rising seawater.

In a <u>perfect storm of ACD-related problems</u>, the entire Eastern Seaboard in the US is facing a crisis caused by the shorelines sinking from too much groundwater being pumped out, while simultaneously being confronted with rising sea levels, according to an April study.

Another <u>recent study</u> shows that sea level rise is happening faster than it has for at least the last 27 centuries.

Meanwhile, drought continues to plague many parts of the world.

In the United States, this is most obvious in California, where the ongoing drought, which many scientists are already explaining as the beginning of a multidecade megadrought, saw the majority of the state's major water reservoirs at <u>below-average levels</u>, even at the end of the so-called rainy season.

The situation is bad enough that California is <u>looking toward Australia</u> in order to learn how that country dealt with a 14-year drought by doing things like using rooftop water storage tanks, shared showers and recycled toilet water, among other water-saving techniques.

In India, power stations have been shutting down for "<u>unprecedented</u>" amounts of time due to lack of water. Even the <u>Ganges River</u> is seeing its flow receding, a crisis that shows the water situation in India is critical and worsening.

A <u>recent study</u> found that Asia is now officially in "high risk" of severe water stress: It estimated that approximately 1 billion people there will be "severely" short of water by 2050 if global population growth and ACD continue without a radical change in proper water use planning.

Also in Asia, the <u>most severe drought in 100 years</u> has killed thousands of farm animals across Vietnam.

Meanwhile, ocean waters around the globe continue to warm alongside the atmosphere.

Off the east coast of Australia, this warming has caused the "worst" bleaching event in history for the Great Barrier Reef. The 1,400-mile-long reef is the single largest living ecosystem on the planet, and is now in danger of being lost, as approximately 95 percent of the entire area is bleached. If the waters do not cool enough soon to give the reef a chance to bounce back, most of the bleached areas (in other words, most of the reef) will die, which has caused local media in Australia to question if what we are witnessing is the end of the Great Barrier Reef.

As this event is happening, <u>a recent report</u> showed that the link between the bleaching event and fossil fuels is both clear and "incontrovertible."

Beyond the Great Barrier Reef, <u>another recent report</u> found scientists alarmed at the frequency and area of coral death around the world, most of which is clearly being caused by ACD.

One <u>scientist referred</u> to the death of coral happening around the world as a "horror show,"

and warned that dying and dead coral reefs may well be an indicator of the beginning of "dangerous" ACD.

Fire

Record-setting wildfires continue to blaze at various locations around the globe.

The single largest wildfire in Kansas history raged through that state recently, burning roughly 400,000 acres across two states. Local <u>reports</u> showed Kansas' Republican Gov. Sam Brownback declaring states of emergency for at least five counties.

Across the globe in Nepal, out of control wildfires consumed more than 3.2 million acres of forest in a mere 15 days, according to NASA data on the disaster.

Air

In the 135 years of record-keeping to date, the United States is officially already experiencing its third-warmest year to date, according to <u>recent National Oceanic and Atmospheric Administration data</u>.

As if to underscore that point, the largest US city in the Pacific Northwest, Seattle, saw a <u>record temperature</u> on April 18 of 89 degrees Fahrenheit, which demolished the previous record for that day by a whopping 4 degrees.

Some interesting footnotes to the recent heat record in Seattle include the fact that the record was 30 degrees above the April 18 daily average temperature of 59 degrees Fahrenheit, which made it the biggest departure from average for any existing record. The new record temperature was even 12 degrees hotter than the average high temperature during the warmest of Seattle's summer days, which occur (at least until now) from July 19 through August 16.

The record temperature was also <u>hotter than the hottest day during the summer of 2011</u>, in its entirety. The record hot day was also part of the first three-day stint of 80 degrees Fahrenheit or above in Seattle in April.

Denial and Reality

The ongoing Republican presidential campaigning means that ACD denial is reaching a fever pitch.

Republican presidential candidates Sen. Ted Cruz (R-Texas) and front-runner Donald Trump both vowed to undo several Obama administration policy efforts aimed at mitigating ACD impacts.

Meanwhile, former governor of Alaska and vice presidential candidate <u>Sarah Palin</u> <u>claimed</u> that ACD was "bogus" and a myth that scientists and policy makers "are peddling" in order to advance political agendas.

Also on the denial front, the group Media Matters cataloged the questions asked during both the Republican and Democratic presidential debates, and found that of the 1,477 questions asked by the various networks to the candidates, only 22 of them (approximately 1.5 percent) were about ACD. Of all the networks that hosted debates, the one that asked the

most ACD-related questions was the Spanish-language network (Univision, which is US-based).

Back to reality, recent polling shows that the <u>vast majority of Americans</u> now believe that ACD is real and ongoing, and that the US government needs to do something about it.

Meanwhile, scientists in a global coalition known as <u>Climate Feedback</u> have begun working together with the aim of sorting fact from fiction in US media ACD coverage.

According to Michael Levitin, the group's communications coordinator, the new group will use a web platform to verify facts and annotate online articles and include their comments on top of the original story. They will then use a rating system so readers are able to judge the stories' scientific credibility.

"Recognized by NASA, the UN Framework Convention on Climate Change and California Gov. Jerry Brown, among others, Climate Feedback is already improving journalistic standards by flagging misreported climate science in mainstream outlets," Levitin said.

A <u>recent study in the International Journal of Primatology</u> found that every primate species on the planet will be negatively impacted by both increasing temperatures and the varying rainfall levels associated with ACD.

"This is troubling news for the world's primates, as many species rely on narrow habitats or have extremely specialized diets," according to a <u>report in Scientific American</u> about the study. "Some primates only eat one or two things, so their food and habitats are particularly sensitive to disruption. Many primates are already endangered by habitat loss, hunting, or the illegal pet trade, so this additional threat could push several species over the brink."

<u>Another recent study</u> shows how unlikely the world is to keep global temperatures from rising above 2 degrees Celsius, the temperature stated as the threshold that cannot be crossed in last year's climate talks in Paris. To underscore their point, the <u>authors of the study point out</u> that, staggeringly, every hour of every day:

- 3.7 million barrels of oil are extracted from the Earth
- 932,000 tons of coal are removed from Earth
- 395 million cubic meters of natural gas are removed from Earth
- 4.1 million tons of carbon dioxide are put into the Earth's atmosphere
- 9,300 more people inhabit the Earth

To round out this month's reality checks, <u>according to the US Environmental Protection Agency</u>, recently released data show that greenhouse gas emissions in the United States are not decreasing. Rather, they increased in both 2013 and 2014, the most recent years where data is available.

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