

2020 began with the hottest January in recorded history

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The Earth just experienced its hottest January in recorded history, as reported by the US National Oceanic and Atmospheric Administration. Both land and ocean temperatures exceeded all records for the last 141 years. The readings were 1.13 degrees Celsius (2.05 degrees Fahrenheit) above the 20th century mean. This is no aberration; the four hottest Januarys have all taken place since 2016, and the 10 hottest all occurred since 2002.

For the year as a whole, 2019 was the second hottest on record after 2016. Temperatures were more than 0.6 degrees Celsius (1 degree Fahrenheit) above the 1981 to 2010 average, according to Copernicus Climate Change Service. Based on this trend, 2020 is likely to be among the five hottest on record. Scientists have warned that an increase of 2 degrees Celsius above the pre-industrial mean will have catastrophic consequences, including massive flooding, drought, wildfires and crop failures.

One especially telling statistic was recently recorded in Antarctica. On February 7, the highest temperature ever measured on the frozen continent—18.3 degrees C (64.9 degrees F)—was reached at the Esperanza Base along Antarctica's Trinity Peninsula. This tops the previous record of 17.5 degrees C (63.5 degrees F) just five years ago in March 2015. Antarctica is among the fastest warming regions in the world.

What makes this especially alarming is the huge amount of water currently held by the continent's glaciers. As temperatures increase, the rate at which these glaciers melt is accelerating. Measurements show that approximately 87 percent of glaciers on the west coast of the Antarctic Peninsula have retreated (i.e., melted back) over the last half-century, with the rate increasing during the past dozen years.

If the Antarctic Ice Sheet were to melt completely,

global sea levels would rise approximately 60 meters (200 feet). Add to that, the Greenland Ice Sheet, which is also melting at an accelerating rate, sea level would rise by another 6 meters (20 feet). And that does not even include the additional contribution from smaller glaciers around the world, such as in the Himalayas and the Alps. All told, if all the world's glaciers were to melt, which is highly likely given current trends in rising global temperatures, sea level would reach about 70 meters (230 feet) above current levels.

Even short of these extreme scenarios, sea level rise will have devastating impacts. Current projections indicate that by the end of this century, global sea levels will rise between 0.5 and 2.5 meters (1.6 and 8.2 feet). Globally, in 2000, approximately 30 percent of urban land lay within high-frequency flood zones, projected to rise to 40 percent by 2030.

An analysis of the dire consequences of projected sea level rise (SLR) on one part of the global population was recently published in the scientific journal *PLOS ONE*. "Modeling migration patterns in the USA under sea level rise" (Robinson, Dilkina, and Moreno-Cruz, 22 January 2020) describes the displacement of tens of millions of people resulting from the inundation of low-lying portions of the US, including many of its major cities.

This enforced migration would not only have devastating consequences for those driven to flee their homes, jobs and their whole way of life, but would also have drastic consequences (so-called "indirect effects") for the "recipient" areas, which are totally unprepared for the massive influx of people that would ensue.

In the US alone, 123.3 million people, 39 percent of the population, lived in coastal counties in 2010. By 2100, 13.1 million would be in permanently flooded areas, based on a rise of 1.8 meters (6 feet) in sea level,

resulting in a massive migration of climate refugees. The Robinson et al model predicts that by 2100, 56 percent of counties will experience substantial population influxes under a 1.8-meter sea level rise scenario.

It must be remembered that sea level rise will result not only in permanent inundation of formerly habitable areas, but also the more frequent temporary flooding of adjacent areas due to increasingly powerful storms. In addition, infiltration of saltwater into the groundwater of low-lying agricultural areas will negatively impact food production.

The authors stress that these migrations will not necessarily follow the relatively limited, “business as usual” patterns of population movement that have been experienced so far due to such temporally limited events as Hurricanes Katrina and Rita. Recipient areas will include both nearby and more distant locations far from coastal regions. As a result, major disruptions will occur in a wide variety of spheres, including housing, transportation, employment and food production.

As illustrated in Figure 1, the entirety of the US Atlantic, Gulf and Pacific coasts will be under water, including many major cities. Among these are Boston, New York, Philadelphia, New Orleans and Miami, to name just a few. Inundation will reach significantly inland as well. Much of Florida will be inundated, leaving only a central island and a northern-most remnant. Beyond that, many counties will experience population influxes of tens and hundreds of thousands of additional people.

The Robinson et al model has been applied only to the United States. Similar effects will occur around the world, affecting billions of people directly and indirectly.

Sea level rise is only one consequence of anthropogenic (human-induced) climate change. Droughts, flooding due to excessive rainfall, wildfires (as recently experienced in Australia and California) and other extreme weather events have already disrupted the lives of millions of people. The impact of climate refugees from Africa, Mexico and Central America, along with those driven out by war, political persecution and economic crises, moving to Europe and North America pales in comparison to the massive disruptions that will occur under even “moderate” projected scenarios of climate change.

decades of inaction have demonstrated. As the capitalist system is totally unprepared for the consequences of sea level rise and other effects of climate change which will increasingly manifest themselves over the next few decades. Only a massive, globally coordinated effort, encompassing both a drastic reduction in greenhouse gas pollution and measures to prepare for population dislocations, can avert catastrophe. This will not happen as long as the world is divided into rival nation states and dominated by competing private corporations. Only a united, socialist world can deal with this existential crisis.



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