

Climate Fact Sheet (September 2018)

Greenhouse-gas emissions are destabilizing Earth's climate system. With global warming, polar regions have lost billions of tons of ice and sea levels have risen by trillions of gallons of water. Droughts last longer, far more wildfires rage, weather events are more extreme, and many species face extinction.

Further, today's climate impacts are the results of emissions released about 40 years ago.

The Arctic: In recent years, the Arctic has been heating up faster than any other place on the planet¹ (last winter, Arctic temps were 45°F above normal).² Sea ice is melting at its fastest pace in 1500 years.³ Bering Sea ice hit a record low in 2018,⁴ and now even the oldest and thickest sea ice has started breaking up.⁵ A warming Arctic has the potential to alter the jet stream and the gulf stream, which can severely disrupt US and European weather.⁶

Antarctica: Antarctica has experienced a substantial loss of ice from warm water eating away at the bottom of critical ice shelves.⁷ Global warming of more than 1.9°C could push parts of the West Antarctic Ice Sheet past a melting threshold that would rapidly increase the pace of sea-level rise.⁸

Greenland: The West Greenland Ice Sheet melted at a dramatically higher rate over the last 20 years than at any other time in the modern record. Loss of Greenland ice is one of the largest contributors to global sea-level rise.⁹

Northern Thaw: Permafrost holds twice as much carbon as the Earth's atmosphere. Last winter, ground that insulates permafrost did not freeze and experts worry that a thaw will release trapped gases that could accelerate climate change.¹⁰ Methane, a more potent greenhouse gas than CO², is already being released from the sea floor of northern continental shelves, and bubbling out of meltwater lakes at a rate double previous estimates.¹¹

Glaciers: Since the early 20th century, glaciers have been retreating at unprecedented rates. Several have disappeared altogether and many more may vanish within decades.¹² Glaciers provide water to millions of people as well as to natural ecosystems.¹³ If emissions are not curtailed, over the next 30 years the US West could lose up to 60% of the snowpack that supplies its irrigation and drinking water.¹⁴

Heat: We're seeing five times more monthly heat records now than we would in a stable climate.¹⁵ More heat dries out soils and causes more droughts and wildfires, as well as extreme rain events.¹⁶ From May-July 2018, the *entire US* ranked hottest in records that go back to 1895.¹⁷ Half the world could have deadly heat waves by the end of the century, and more than a quarter could see serious drought and desertification by 2050.¹⁸

Warming Waters: The rate of ocean warming has nearly doubled since 1992. Higher temps drive marine life toward the poles and kill coral reefs, kelp forests,¹⁹ and, since 1950, 40% of phytoplankton, which form the base of the aquatic food web and are responsible for most of the transfer of CO² from atmosphere to ocean.²⁰ Warm waters also drive more weather extremes, such as the three deadly back-to-back hurricanes of 2017.²¹

Sea-Level Rise: The rate of sea-level rise is increasing. In 2017, global mean sea level was 3" above the 1993 average—the highest annual average in the satellite record. The rise is mostly due to meltwater from glaciers and ice sheets, and expansion of seawater as it warms. A greater than 90% chance exists that global mean sea level will rise at least 8" but no more than 6.6' by 2100.²²

Acidification: Since the industrial era began, oceans have absorbed about 22 million tons of CO² per day. This creates acidification, which can prevent marine life from forming shells. On our current emission trajectory, oceanic conditions will be unlike anything marine ecosystems have experienced for the last 14 million years.²³

Gulf Stream Slowdown: There is strong evidence that a slowdown of the Gulf Stream system has started. Impacts include much faster sea-level rise and much warmer sea-surface temps.²⁴ Gulf Stream ocean currents are crucial in controlling global climate. In April 2018, the system was at its weakest ever recorded.²⁵

Footnote References

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Over 15,000 scientists from more than 180 countries warn humanity

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Full statement & list of signatories here: <https://academic.oup.com/bioscience/article/67/12/1026/4605229>

In 1992, the Union of Concerned Scientists and more than 1700 independent scientists, including the majority of living Nobel laureates in the sciences, penned the 1992 “World Scientists’ Warning to Humanity”. These concerned professionals called on humankind to curtail environmental destruction and cautioned that “a great change in our stewardship of the Earth and the life on it is required, if vast human misery is to be avoided.” In their manifesto, they showed that humans were on a collision course with the natural world. They expressed concern about current, impending, or potential damage on planet Earth involving ozone depletion, freshwater availability, marine life depletion, ocean dead zones, forest loss, biodiversity destruction, climate change, and continued human population growth. They proclaimed that fundamental changes were urgently needed to avoid the consequences our present course would bring.

The authors of the 1992 declaration feared that humanity was pushing Earth's ecosystems beyond their capacities to support the web of life. They described how we are fast approaching many of the limits of what the biosphere can tolerate without substantial and irreversible harm. The scientists pleaded that we stabilize the human population, describing how our large numbers—swelled by another 2 billion people since 1992, a 35 percent increase—exert stresses on Earth that can overwhelm other efforts to realize a sustainable future. They implored that we cut greenhouse gas (GHG) emissions and phase out fossil fuels, reduce deforestation, and reverse the trend of collapsing biodiversity. Since 1992, with the exception of stabilizing the stratospheric ozone layer, humanity has failed to make sufficient progress in generally solving these foreseen environmental challenges, and alarmingly, most of them are getting far worse. Especially troubling is the current trajectory of potentially catastrophic climate change due to rising GHGs from burning fossil fuels, deforestation, and agricultural production—particularly from farming ruminants for meat consumption. Moreover, we have unleashed a mass extinction event, the sixth in roughly 540 million years, wherein many current life forms could be annihilated or at least committed to extinction by the end of this century....

Humanity is now being given a second notice....By failing to adequately limit population growth, reassess the role of an economy rooted in growth, reduce greenhouse gases, incentivize renewable energy, protect habitat, restore ecosystems, curb pollution, halt defaunation, and constrain invasive alien species, humanity is not taking the urgent steps needed to safeguard our imperiled biosphere.

As most political leaders respond to pressure, scientists, media influencers, and lay citizens must insist that their governments take immediate action as a moral imperative to current and future generations of human and other life....

The rapid global decline in ozone-depleting substances shows that we can make positive change when we act decisively. We have also made advancements in reducing extreme poverty and hunger. Other notable progress includes the rapid decline in fertility rates in many regions attributable to investments in girls’ and women's education, the promising decline in the rate of deforestation in some regions, and the rapid growth in the renewable-energy sector. We have learned much since 1992, but the advancement of urgently needed changes in environmental policy, human behavior, and global inequities is still far from sufficient....

To prevent widespread misery and catastrophic biodiversity loss, humanity must practice a more environmentally sustainable alternative to business as usual. This prescription was well articulated by the world's leading scientists 25 years ago, but in most respects, we have not heeded their warning. Soon it will be too late to shift course away from our failing trajectory, and time is running out. We must recognize, in our day-to-day lives and in our governing institutions, that Earth with all its life is our only home.

Climate info was compiled by Evelyn Adams for *Transition Fidalgo & Friends*.