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The Climate Emergency: 2020 in Review

Despite some promising developments, the need for action has grown even more urgent

- By [William J. Ripple](#), [Christopher Wolf](#), [Thomas M. Newsome](#), [Phoebe Barnard](#), [William R. Moomaw](#) on January 6, 2021



Horses panic as a wildfire approaches near Canberra, Australia in February of 2020.

Credit: [Getty Images](#)

The climate emergency has arrived and is accelerating more rapidly than most scientists anticipated, and many of them are deeply concerned. The adverse effects of climate change are much more severe than expected, and now threaten both the biosphere and humanity. There is mounting evidence [linking increases](#) in extreme weather frequency and intensity to climate change. The year 2020, one of the [hottest years on record](#), also saw extraordinary wildfire activity in [the Western United States](#) and [Australia](#), a [Siberian heat wave](#) with record high temperatures exceeding 38 degrees C (100.4 degrees Fahrenheit) within the Arctic circle, a record low for [October Arctic sea ice extent](#) of 2.04 million square miles, an Atlantic hurricane season resulting in [more than \\$46 billion in damage](#), and [deadly floods and landslides in South Asia](#) that displaced more than 12 million people.

Every effort must be made to reduce emissions and increase removals of atmospheric carbon in order to restore the melting Arctic and end the deadly cycle of damage that the current climate is delivering. [Scientists now find](#) that catastrophic climate change could render a significant portion of the Earth uninhabitable consequent to continued high emissions, self-reinforcing climate feedback loops and looming tipping points. To date, 1,859 jurisdictions in 33 countries have issued [climate emergency declarations](#) covering more than 820 million people.

In January 2020, we warned of untold human suffering in a report titled [World Scientists' Warning of a Climate Emergency](#) with more than 11,000 scientist signatories from 153 countries at time of publication. As an Alliance of World Scientists, we continue to [collect signatures](#) from scientists, with now more than 13,700 signatories. In our paper, we presented graphs showing vital signs of [very](#)

[troubling climate change trends](#) with [little progress by humanity](#). Based on these trends and scientists' moral obligation to “clearly warn humanity of any catastrophic threat” and to “tell it like it is,” we declared a climate emergency and proposed policy suggestions. We called for transformative change with [six steps](#) involving energy, short-lived air pollutants, nature, food, economy and population. A short [video discussion](#) by thought leaders on the six steps is now available.

Here, we investigate progress for these six steps during 2020. We have seen a few promising developments on energy, nature and food. Impressively, the European Union is on track to meet its [emissions reduction goal](#) for 2020 and become zero net carbon by 2050; however, this goal will still increase temperatures from the damaging levels of today. We are also encouraged by the recent trend of governments committing to zero net carbon, including [China by 2060](#) and [Japan by 2050](#). [Similar pledges](#) have been made by the United Kingdom, many subnational governments and some corporations, although there is [mounting evidence](#) that a 2050 or later target may be inadequate and net zero carbon should be reached much earlier, for example, by 2030.

U.S. President-elect Joe Biden has pledged that the U.S. will [rejoin the Paris agreement](#) and proposed a \$2 trillion [climate plan](#) to phase down fossil fuels by expanding renewable energy capacity while creating jobs, reducing pollution and investing in [historically disadvantaged communities](#). It is critically important to significantly reduce CO₂ emissions while simultaneously increasing carbon accumulation by [forests](#), mangroves, wetlands and other ecosystems. Progress for nature came in the form of the [Bonn Challenge](#) to restore forest and other ecosystems, but much more investment is needed in natural climate solutions. Global meat consumption, which must be reduced for climate mitigation, is expected to [decline 3 percent this year](#), largely as a result of COVID-19. While likely a temporary decline, this coincides with increasingly popular meat substitutes; annual U.S. sales are projected to [reach \\$1 billion](#) in 2020.

Although lockdowns associated with the COVID-19 pandemic resulted in a [decrease in CO₂ emissions of 7 percent in 2020](#), this reduction is unlikely to be long-lived because there has been no major concurrent shift in the way we produce energy. This drop in emissions was a tiny blip compared to the cumulative buildup of greenhouse gases, which has led to [all five of the hottest years on record](#) occurring since 2015. In fact, atmospheric concentrations of CO₂ continued to rise rapidly in 2020 reaching a [record high in September](#). COVID-19 also led to a one year postponement of the [COP26 United Nations climate change conference](#), after the 2019 [failure of the COP25 conference](#) to make meaningful progress. We are concerned that [no major industrialized country](#) is on track to limit warming to 1.5 degrees C, the target of the [Paris Agreement](#). Instead, the actions of many wealthy countries—including the U.S.—are consistent with greater than three degrees C warming. Unfortunately, progress in 2020 has also been limited in the areas of short-lived air pollutants, the economy and population.

As we move into 2021 and beyond, we need a massive-scale mobilization to address the climate crisis, including much more progress on the six steps of climate change mitigation. Key actions for each step include the following:

1. **Energy.** Swiftly phasing out fossil fuels is a top priority. This can be achieved through a multipronged strategy based on rapidly transitioning to low-carbon renewables such as solar and wind power, implementing massive conservation practices, and imposing carbon fees high enough to curtail the use of fossil fuels.
2. **Short-lived pollutants.** Quickly cutting emissions of methane, black carbon (soot), hydrofluorocarbons and other short-lived climate pollutants is vital. It can dramatically reduce the short-term rate of warming, which may otherwise be difficult to affect. Specific actions to

address short-lived pollutants include reducing methane emissions from [landfills](#) and the [energy sector](#) (methane), promoting [improved clean cookstoves](#) (soot) and developing better [refrigerant options and management](#) (hydrofluorocarbons).

3. **Nature.** We must restore and protect natural ecosystems such as forests, mangroves, wetlands and grasslands, allowing these ecosystems to reach their ecological potential for sequestering carbon dioxide. The [logging of the Amazon](#), tropical forests in [Southeast Asia](#), and other rainforests including the [proposed cutting](#) in the Tongass National Forest of Alaska is especially devastating to the climate. Creation of new protected areas, including strategic forest carbon reserves, should be a top priority. [Payment for ecosystem services](#) programs offer an equitable way for wealthier nations to help protect natural ecosystems.
4. **Food.** A dietary shift toward eating more plant-based foods and consuming fewer animal products, especially beef, would [significantly reduce emissions](#) of methane and other greenhouse gases. It would also free up agricultural lands for growing human food and, potentially, reforestation (“Nature” step). Relevant policy actions include minimizing tillage to maximize soil carbon, cutting livestock subsidies and supporting research and development of environmentally friendly meat substitutes. [Reducing food waste](#) is also critical, given that at least one third of all food produced is wasted.
5. **Economy.** We must transition to a carbon-free economy that reflects our dependence on the biosphere. Exploitation of ecosystems for profit absolutely must be halted for long-term sustainability. While this is a broad, holistic step involving [ecological economics](#), there are specific actions that support this transition. Examples include cutting subsidies to and divesting from the fossil fuel industry.
6. **Population.** The global human population, growing by more than 200,000 people per day, must be stabilized and gradually reduced using approaches that ensure social and economic justice such as [supporting education for all girls and women](#), and increasing the availability of voluntary family planning services.

These steps synergize with each other and together ensure a sustainable future. They also have many co-benefits beyond climate mitigation. For example, stabilizing human population size can improve climate adaptation capacity in the event of declining crop yields. Similarly, plant-rich diets offer [significant benefits](#) for human health.

In December 2020, U.N. Secretary-General [Antonio Guterres pleaded](#) for every nation to declare a “climate emergency.” Thus, we call for the U.S. government to proclaim a climate emergency with either Joe Biden declaring a national climate emergency through an executive order or Congress passing major climate mitigation funding and a declaration of a climate emergency ([H.Con.Res.52](#), [S.Con.Res.22](#)) that has been buried in a Congressional committee throughout 2020. One year ago, we were troubled about poor progress on mitigating climate change. We are now alarmed by the failure of sufficient progress during 2020.

However, there are glimmers of hope. Young people in more than 3,500 locations continued global climate strikes calling for [urgent action](#). The [Black Lives Matter movement](#) has brought deep social injustice and inequality to the surface of our social and economic systems. Rapid progress in each of the six steps can be achieved when they are framed from the start in the context of [climate justice](#), as climate change is a deeply moral issue. But this is only possible when those who face the greatest climate risks help shape the response, including [Indigenous peoples, women, youth, people of color](#) and [low-income people](#). Aggressive transformative change, if framed holistically and equitably, will accelerate broad-based restorative action and avert the worst of the climate emergency. The survival of our society as we know it depends upon this unprecedented change.

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