



Dispatches From The Wild, Weird World Of Humanity And Its Biosphere

April 14, 2021

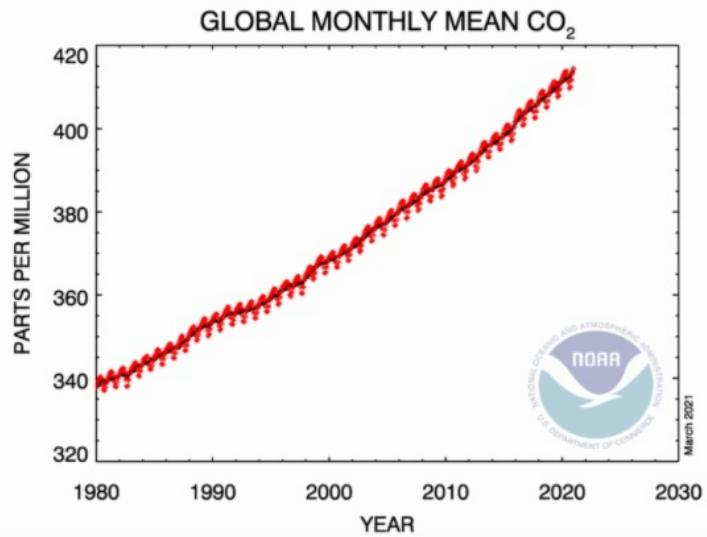
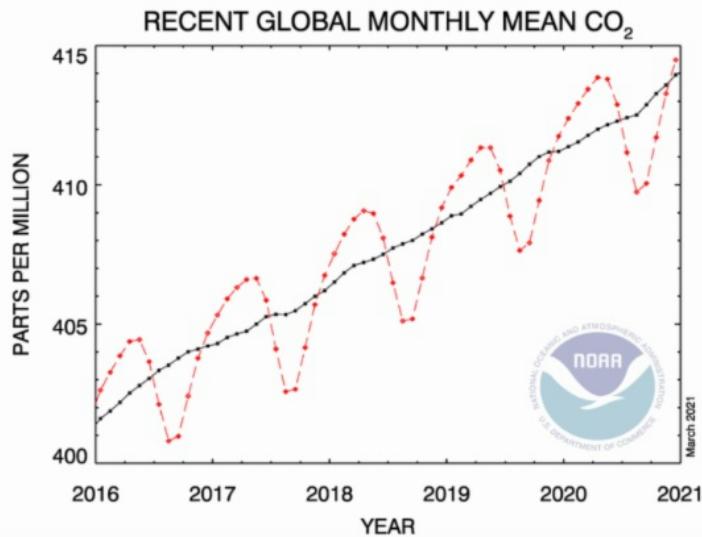
In this issue of The Weekly Anthropocene, we will be zooming out from our customary bouquet of specific stories to provide a big-picture overview of the state of the fight against climate change. If the planetary threats described in the first half of this newsletter seem too overwhelming, please keep reading-there's a lot of incredible progress and positive trends happening as well!

The Big Picture: Danger

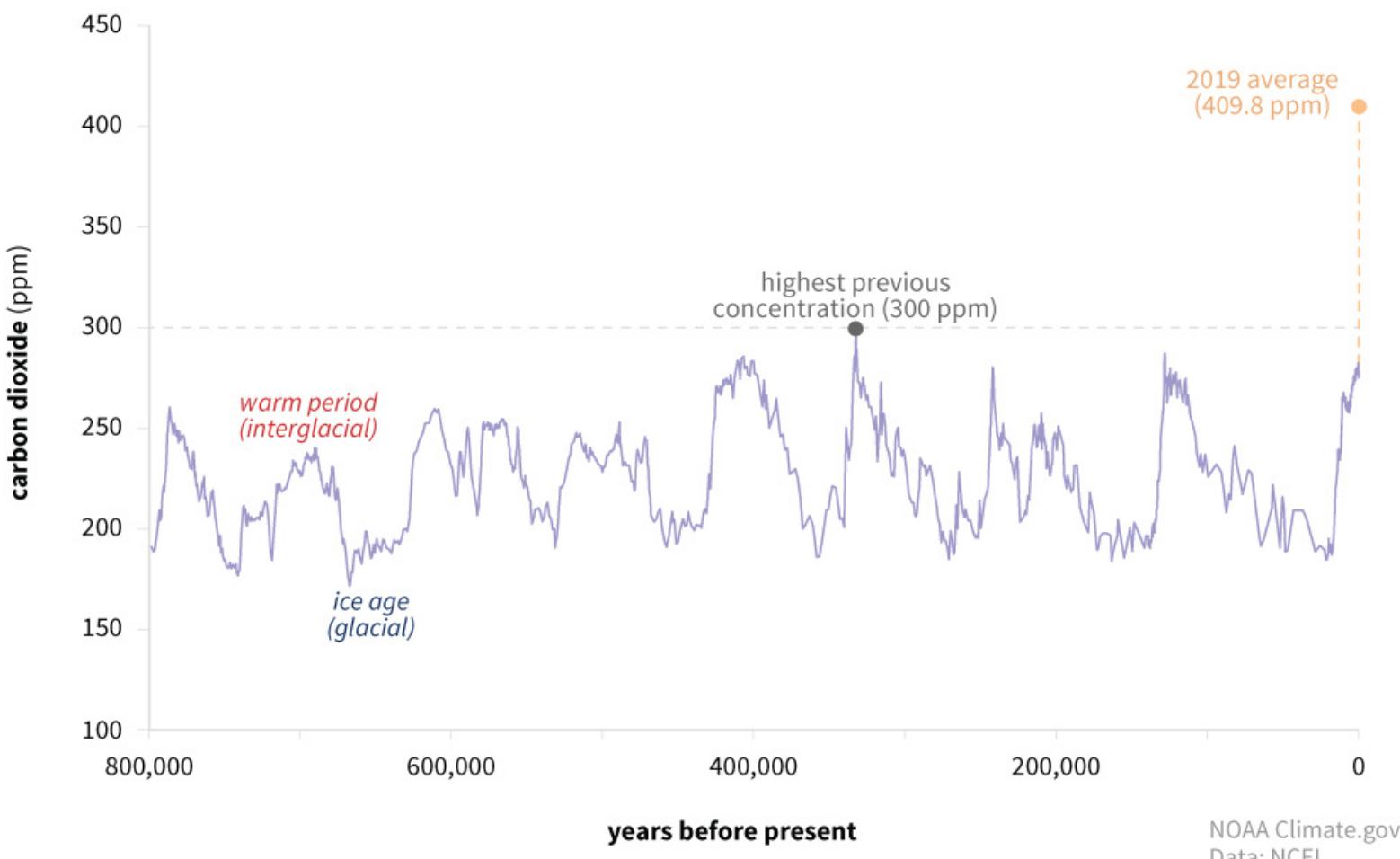
Global Monthly Mean CO₂

December 2020: 414.49 ppm
December 2019: 411.75 ppm

Last updated: March 5, 2021



CARBON DIOXIDE OVER 800,000 YEARS



As is well known and as several recent news stories confirm even further, several of Earth's major biogeochemical cycles are being severely altered by human activity.

[NOAA reports that in 2020](#), the global surface average concentration of carbon dioxide (CO₂) in the atmosphere was 412.5 parts per million (ppm). That sounds like a fairly dry, technical passage, but it's actually an epically profound and literally epoch-making one.

[For context](#) (see second banner image) CO₂ ppm in the last Ice Age was around 200. Before the Industrial Revolution—that is, for most of humanity's recorded history—it was around 280. In 1987, when climate scientists were issuing the first warnings of climate change to the US Senate, it was 350. In 2000, the year this writer was born, it was 369 ppm. The last time there was this much carbon dioxide in the atmosphere was 3.6 million years ago, in the Mid-Pliocene Warm Period. ([And yes, we're as certain as we can be of anything in the universe that this increase is caused by human activity. Really, really certain](#)).

Furthermore, methane levels (methane is a much less common but much more potent greenhouse gas than CO₂, often emitted from uncapped natural gas wells) are also rising, hitting 1892.3 parts per billion (ppb) in 2020, compared to under 1650 ppb in the 1980s.

It's important to remember, as the climate crisis factors into debates on everything from water heaters to zoning to farming practices to food to transport, that this is

NOAA Climate.gov
Data: NCEI

what it's all about. It is *insane* that one of the major regulators of temperature on Earth is increasing this much in a fragment of a human lifetime. What the increase in CO₂ concentration means in simple terms is that one of the major dials governing the state of life on this planet has been turned up to one-and-a-half times the level at which human civilization arose, with most of the increase happening *within the last few decades*. This is what the renewables revolution, regenerative agriculture, tree-planting campaigns, and all the rest are fundamentally about. In addition to their multitude of ancillary benefits, they're part of a humanity-wide struggle to re-stabilize our atmosphere.

The risk brought by climate crisis is not just linear and increasing with greenhouse gas concentration. Around the world, scientists are monitoring key "[tipping points](#)," like melting permafrost and destabilization of the Atlantic thermohaline circulation, where warming temperatures could kickstart a whole new set of problems. One of these key points is the West Antarctic Ice Sheet, where new research has found that the [Pine Island Glacier](#) and

its neighboring [Thwaites Glacier](#) are more vulnerable than previously thought, with more (relatively) warm water flowing beneath them and increasing the risk of melting and collapse. This is *bad*. For those of you not familiar with the Thwaites Glacier, I regret to inform you that it's one of the scariest things on the planet, the kind of landform that keeps climate scientists up at night. You will likely be hearing about it a *lot* more in the coming decades. It essentially acts a "cork" blocking the flow out to sea of much of the West Antarctic Ice Sheet, meaning in simple terms that if the Pine Island and/or Thwaites Glacier melts and opens the floodgates of the ice sheet, humanity unlocks [a whole new bonus tier of sea level rise](#)-possibly up to 11 feet worth, on top of the 3 feet or so already expected by 2100. This is one of the biggest question marks in climate science right now, and the way the dynamics of these two glaciers play out-with relatively little humanity can do about it-will determine a lot of what the next few centuries look like.

[Global forest loss also increased in 2020](#), with an area of tree cover larger than the United Kingdom meeting its end in the saw and the flame. In particular, [we](#)



BBC

[lost 4.2 million hectares](#) of primary tropical forest, one of the most biodiverse and carbon-sequestering ecosystems on Earth. That's more than twice the land area of New Jersey. The destruction of this primary tropical forest is estimated to have released 2.64 billion tons of carbon, or about the annual emissions of 570 million cars.

A major driver of this devastation is the fact that the great ecosystems of Brazil, from the Pantanal to the Amazon, [are in absolutely terrible shape](#), with COVID, illegal deforestation, illegal mining, wildfires (often intentionally set) and brutal attacks on indigenous peoples and environmental activists all widespread and either ignored or actively encouraged by far-right Brazilian President Bolsonaro.

There's a lot of work to be done.



The Big Picture: Progress



And yet....we are also, *at the same time*, making the most and fastest progress ever towards a renewables-powered, habitat-conserving, truly sustainable civilization.

For a start, the renewables revolution is accelerating faster and faster.

The International Energy Agency has confirmed that solar power projects (with decent financing) now produce the [cheapest electricity in history](#).

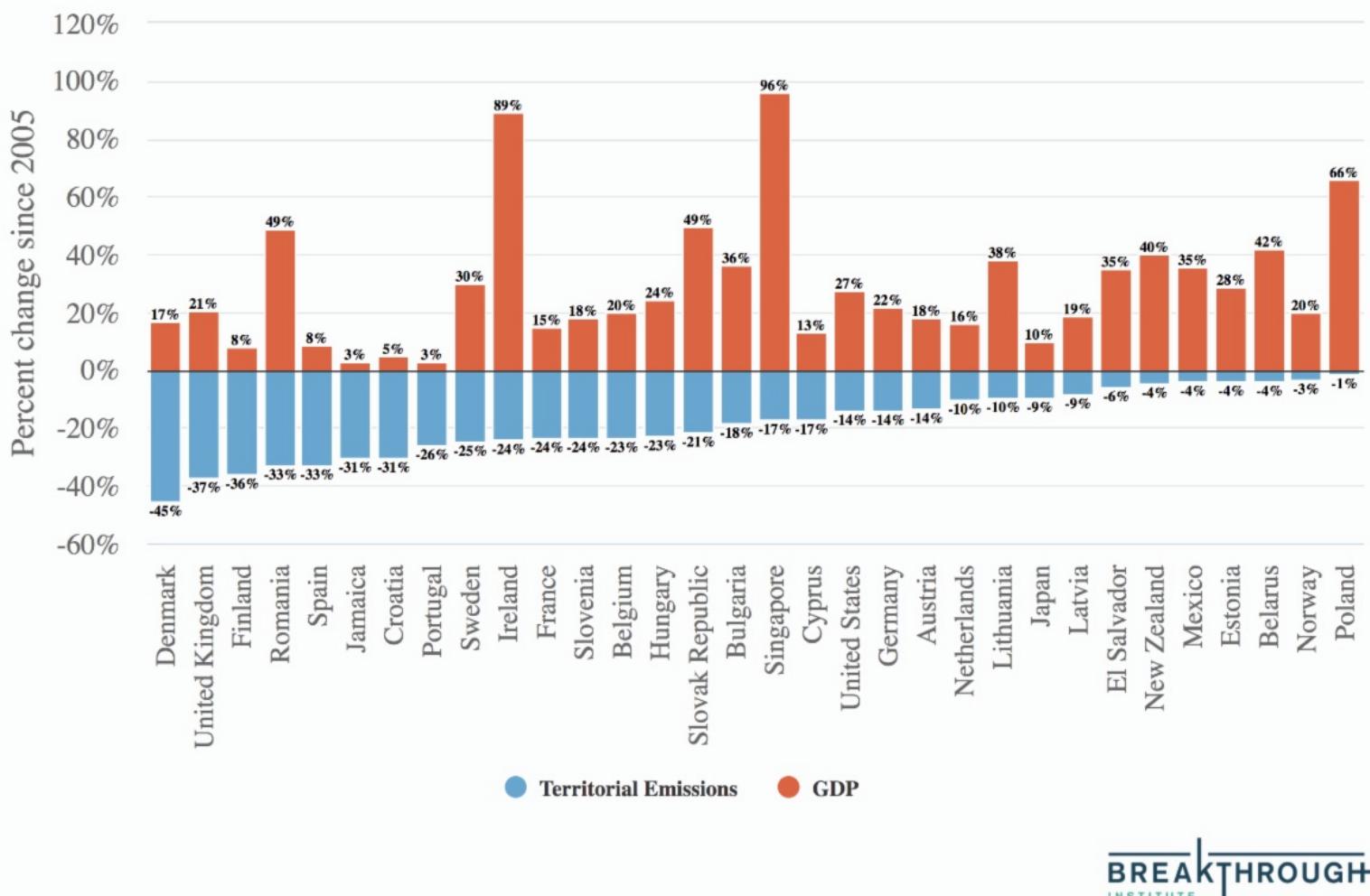


Saudi Arabia, the poster child for oil dependence (it currently just 0.02% of its electricity from renewables) has just pledged to get [50% of its electricity from renewables by 2030](#). This will be accomplished by a massive solar buildup, with one 300-megawatt plant already inaugurated (pictured, above right) and [seven grid-scale solar projects planned](#). The new Saudi environmental pledge also includes a commitment to plant 10 billion trees in the kingdom-difficult given the desert environment, but possible with the right species and planning.

China is still (unacceptably) building coal plants, but its latest 5 Year Plan includes a lot of language and planning that [China experts feel indicates a serious commitment](#) to decarbonize over the next few decades. (Note: it's ethically important to state at this point that Saudi Arabia is ruled by a terrible regime responsible for the [murder of journalists](#) and [famine in Yemen](#), and that [China is actively committing genocide against the Uighurs right now](#). However, two things can be true here. It's critically important for every nation in the world, including the nasty ones, to stop emitting fossil fuels ASAP, and it's good news when they make progress towards doing so.).

Back in the free world, [Scotland](#) got a truly incredible 97.4% of all electricity it used during the calendar year 2020 from renewable energy, up from 37% in 2011. (Banner image above: panorama of [Scotland's Whitelee wind farm](#)). This amazing achievement was primarily due to a massive buildup in onshore and offshore wind power in the 2010s, and shows the world that it's entirely achievable to decarbonize the power sector right now, with existing technology. The only reason this isn't happening this fast everywhere else is political will.

Decoupling of territorial emissions and GDP: 2005-2019



And it *is* happening everywhere else, just slower. A new analysis found that [32 countries](#) (including most European countries, Japan, New Zealand, and the United States) have absolutely decoupled CO₂ emissions from economic growth over the 2005-2019 period (i.e. had their GDP grow **and** their CO₂ emissions decline). They're still emitting too much, of course, but this is empirical evidence that we can absolutely have vibrant economies without reliance on fossil fuels.

[EIA data](#) revealed that [Iowa got 59.6% of its electricity](#) from wind power 2020 (other renewables are negligible in Iowa, so this is essentially the total renewables number as well).

[Massachusetts just passed](#) (and Governor Charlie Baker, a rare reality-recognizing Republican, signed into law) an impressively far-reaching and detailed climate bill. It mandates carbon emissions reduction of 50% below 1990 levels by 2030, 75% by 2040, and 85% by 2050, as well as net-zero carbon emissions by 2050 (i.e. offsetting that last 15% with projects like tree planting and direct air capture), requires that utilities increase their renewable energy portfolio by at least 3% every year and secure an additional 2,400 megawatts of wind power, and adds to that a [laundry list](#) of regulatory tweaks and add-ons that incentivize the state government, companies, utilities, communities, and

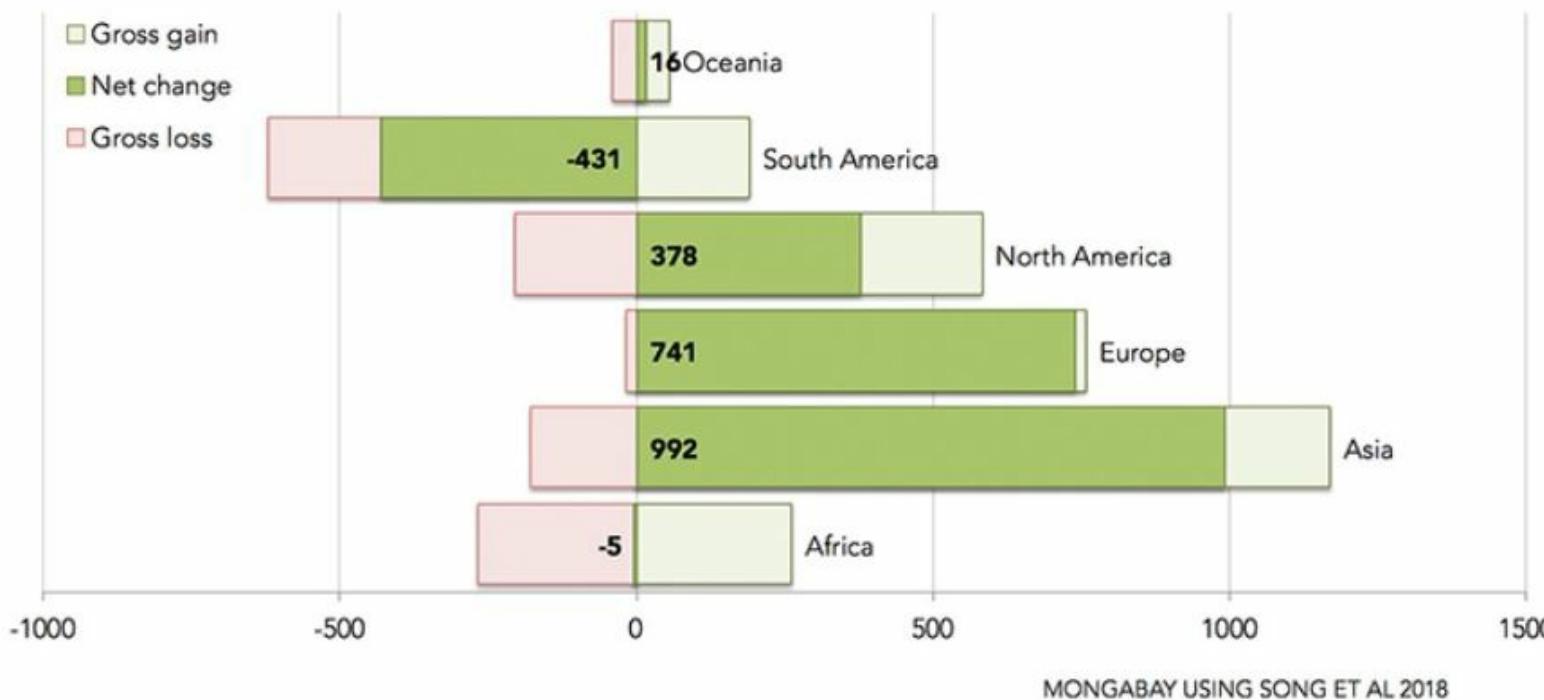
consumers to build up renewables, EVs, and more.

[Japan](#) and [South Africa](#)'s governments are working on more ambitious emissions reduction targets ahead of the Glasgow climate talks this November.

If President Biden's proposed [massive infrastructure bill](#) and [yearly budget](#) pass, even in a heavily modified form, it would be the biggest American investment in decarbonization ever, an absolutely transformative victory.

And it's important to remember that moving to renewables and instituting new emissions regulations doesn't just help with the long-term climate fight, it saves people's lives from air pollution in the short term. [A new study found](#) that California's strict pollution controls reduced diesel particulate matter emissions by 78% from 1990 to 2014 (compared to just 51% in the nation as a whole over that time period). As a direct result of this, deaths from cardiopulmonary diseases linked to diesel pollution fell by an amazing 82% statewide.

Tree canopy cover loss/gain 1982-2016 (1000 sq km)



Beyond emissions and renewables, even as tropical forest is being lost from Brazil to the Congo, people from China to the Sahel to Europe are [planting new trees at an unprecedented rate](#)-and even more is growing back on its own.

Despite the destruction of the world's tropical forests, an analysis of satellite data from 1982 through 2016 found that [Earth actually substantially net increased tree cover over that period](#), with losses in the tropics outweighed by factors like farmland reverting to forest in North America, Europe and Russia, tree planting initiatives in China, and warming temperatures leading to forests expanding in montane and polar areas. (If this seems to contradict the fact that global tree

cover loss has been occurring for years, keep in mind that this is *net* change, so in this analysis massive losses occurred, but even bigger gains took place elsewhere). This isn't a one-to-one replacement by any means, as tree cover includes industrial with very low biodiversity, and one square mile of that is not even a fraction as ecologically important as one square mile of Amazonia. However, it's still good news for overall planetary health, even though it doesn't discount in any way the incredible need to protect tropical forest.



And while the extinction crisis is scary, science writer and climate activist [Emma Marris has an excellent article in The Atlantic](#) outlining how standard ways of reporting on it make it seem much worse than it really is.

Most papers that warn of an oncoming "sixth mass extinction"-while positing a legitimate possibility-are calculating what would happen if every endangered species goes extinct and/or every declining species continues to decline. And if there's anything the last few decades have made clear, it's that a heck of a lot of humans are willing to dedicate their lives to make sure that doesn't happen.

Continent-spanning species like the passenger pigeon and the aurochs were driven to extinction by hunting pressures well before the modern conservation movement or the acceleration of climate change. But since the dawn of the 20th century, tigers, rhinos, elephants, wolves, California condors, and a great multitude of lesser known species from the [Mauritius kestrel](#) to the [Chatham](#)

[Island black robin](#) to the [golden lion tamarin](#) have been saved from the scaffold by the dedication of small groups of committed conservationists and the eventual support and even love given to these species by the general public. And in the decades since pollution control laws like the Clean Water Act, human-dominated landscapes have become newly hospitable for wildlife. The Weekly Anthropocene loves chronicling these stories, from [humpback whales in New York Harbor \(pictured\)](#) to [urban leopards indirectly saving human lives in Mumbai](#). This newsletter links to a lot of articles, but if you read just one, [read Ms. Marris'](#).

In sum, there's a decent chance that by the second half of the 21st century, we're living in a world with massive sea level rise, coastal flooding, heat waves, and wildfires...but also grids powered by 100% renewable energy, lower air pollution, a surprisingly low rate of extinction due to heroic conservationists and hospitable human-dominated landscapes, and excellent prospects for avoiding truly catastrophic climate change, in the 3 to 5 degrees Celsius "everyone needs to move to Greenland" sense. A world that resists simple narratives of "dystopia" or "utopia." And where we end up along that spectrum, then and in all the years afterwards, will be shaped by the votes, purchases, conversations, writings, and everything else that the people of Earth do here, now, and today. Every fraction of a degree of warming we prevent matters. Every tree we plant. Every particulate-emitting, lung-choking power plant we take down. Every species we protect (and soon, maybe [every species we bring back](#)). Despair prevents people from acting just as much as denial, and is just as unfounded. We are living at a truly extraordinary time in the history of life on our planet, one where the individual choices of the descendants of East African savanna apes can determine the composition of the atmosphere, the life or death of the creatures that share the world with us, the shape of the coastline, the life-richness of a city, the nature of a forest.

We are privileged to be alive in such a time, an era that will shape the future of human civilization and Earth's biosphere. And we have a responsibility to make that future bright.

The Weekly Anthropocene

Email Address:
samuel.matey@maine.edu

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