



# the weekly anthropocene



dispatches from the wild, weird world of humanity and its biosphere

By Sam Matey, December 4 2019

**Nine Tipping Points.** A new study in *Nature*, promulgated by the pioneering researchers of the Stockholm Resilience Centre, warns that nine planetary “tipping points” are currently active due to human-induced global warming, each one with the potential to cause severe instability. A tipping point is a big potential



discontinuity identified in the Earth’s climate system, a change that could have devastating effects worldwide. The nine tipping points currently at risk of massive shifts (pictured) include the West Antarctica, East Antarctica, and Greenland Ice Sheets (all at risk of moving to a more rapid pace of melting and drastically raising sea levels), coral reefs (at risk of collapsing due to a perfect storm of threats and devastating the oceans’ biodiversity and species communities), Arctic sea ice (at risk of becoming open water and massively shifting the Earth’s albedo, furthering warming), the Amazon rainforest (at risk from wildfires, deforestation, and climate change potentially shifting it to a savannah ecosystem, losing loads of stored carbon and wildlife habitat), the world’s boreal forests (evergreen forests mostly in Canada, Northern Europe, and Russia, at risk from increasingly frequent wildfires releasing still-more carbon), the Atlantic circulation (at risk of shifting sharply due to huge new inputs of fresh water from the melting Arctic and Greenland, with big consequences for world weather patterns), and the Arctic permafrost (already beginning to thaw in a warming world, with huge stocks of frozen carbon and methane beginning to be released). Disturbingly, many of these tipping points make a chain patterns several of the others more likely—the melting Arctic and Greenland perturb Atlantic circulation, which could shift weather patterns to make the Amazon drier and more susceptible to wildfires. Wildfires in the Amazon and the boreal forests release carbon, which warms the world further, contributing to the melting of permafrost and ice sheets. If all tipping points continue down the paths they are currently on, it could lead to a climate change worst-case scenario: a hothouse Earth with 8 degrees Celsius of warming and severely compromised habitability. The researchers note that humanity is changing global temperature at a rate an order of magnitude faster than at the end of the last ice age. They state that a declaration of a planetary emergency is needed, and that we need to achieve net-zero carbon emissions in thirty years at the absolute most in order to slow and reduce the risk from these tipping points. For more, see [tinyurl.com/wkm5jkw](https://tinyurl.com/wkm5jkw). For the full *Nature* article, see [tinyurl.com/s72ywgw](https://tinyurl.com/s72ywgw).



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**Decarbonization.** In light of the disturbing new research into Earth's climate tipping points, this article will take stock of some current efforts to decarbonize the modern economy. First, a new study published in Environmental Research Letters and led by renowned energy expert Dr. Amory Lovins of the Rocky Mountain Institute underscores the progress made in renewable energy and energy efficiency. They noted that renewable energy is growing rapidly and becoming cheaper, and looks set to continue to do so for years. In 2018, 68% of the world's net additions of electricity generating capacity (new stuff being built) consisted of modern renewable energy. In that same year, the world reached one terawatt-one trillion watts-of installed wind and solar power, with the next terawatt expected by 2023 at 46% lower cost. Another positive sign was the decrease in primary energy intensity (the amount of energy used to generate one unit of GDP, a measure of the energy inefficiency of an economy). Models historically considered drops in primary energy intensity of 1.5 to 2 percent per year to be ambitious, but from 2010 to 2018, primary energy intensity decreased by an average of 2.03 percent per year, reaching 2.7 percent per year in 2015. In short, thanks to advances in energy efficiency technology (everything from straighter pipes to more efficient buildings) the world is getting more and more economic activity from less and less energy-excellent news. Lovins concludes that we might be on track to hold warming to 2 degrees Celsius. For context, we're currently at 1.1, and 1.5 is the Paris Accords goal to avoid drastic changes. To quote Lovins, "Despair and complacency are equally unwarranted." The world has a lot of work to do, but is under way.

In other decarbonization news, the European Union Parliament voted on November 28<sup>th</sup> to declare a state of emergency due to climate change-just as the tipping points researchers recommended. This is admittedly a symbolic step, but a one of great importance, a historic continent-wide acknowledgement of the scale of the problem. Furthermore, the new President of the European Commission, Ursula von der Leyen, is strongly committed to action on climate change and will be releasing a new slate of climate initiatives on December 11<sup>th</sup>. This "EU Green Deal" is meant to push forward the goal of making Europe the first climate emissions-neutral continent by 2050, and this newsletter looks forward to reporting on it! Finally, on December 2, the 25<sup>th</sup> Conference of the Parties under the UN Framework Convention on Climate Change (COP 25, the UN's annual climate meeting) got underway in Madrid. (This is the climate conference that was moved to Madrid from Chile due to protests and unrest, and the one that the UN Climate Summit in September in New York was leading up to). Nancy Pelosi will lead a congressional delegation of Democratic lawmakers to represent America at the conference, as the hideously irresponsible Trump administration is effectively ignoring it. By next week, we should have a clearer idea of what will emerge from COP 25. For more on the Lovins paper, see [tinyurl.com/vwxjsqe](https://tinyurl.com/vwxjsqe). For the paper itself, see [tinyurl.com/txws2xr](https://tinyurl.com/txws2xr). For more on the EU climate emergency declaration, see [tinyurl.com/tszfyde](https://tinyurl.com/tszfyde). For more on COP 25 in Madrid, see <https://tinyurl.com/se4gzkz>. For more on Pelosi's delegation, see [speaker.gov/newsroom/113019](https://speaker.gov/newsroom/113019).



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**Chicago.** Erratic precipitation due to climate change has led to a drastic rise in the level of Lake Michigan, harming the communities along the coast. Near-record rain and snow fell over Lake Michigan in 2018 and 2019, and lake levels in November 2019 are currently three feet above the November average, with 12-foot waves recently recorded on Chicago's Lake Shore Drive. Chicago is already gearing up to respond: the municipal government recently instituted an emergency shoreline protection project at Juneway Beach, with plans to expand to other beaches. The Army Corps of Engineers is building an immense riprap (chunks of stone to hold together the ground against erosion) barrier on the lakeshore just north of the Barack Obama Presidential Library. However, less wealthy communities in the state of Michigan, along the lake's eastern shore, do not have the resources to adequately respond. In the Anthropocene, climate impacts are everywhere, increasingly a part of all communities' landscapes. For more, see [tinyurl.com/s6h6wzb](https://tinyurl.com/s6h6wzb).

**Coyotes.** While the multifarious changes of the Anthropocene are posing threats to many species, others are thriving as never before. Coyotes (*Canis latrans*) have increased their habitat in North America by 40% since the 1950s, entering New England (hybridizing with wolves and dogs along the way to create the New England "coywolf"), Alaska, Virginia, Florida, and many other states for the first time. They are now present in all states except Hawaii, and, amazingly, have also colonized densely populated urban areas like Washington, D.C., New York City, Los Angeles, and Chicago. All this extraordinary expansion, despite the fact that coyotes have no legal protections and are routinely hunted and trapped en masse in the American West, with over 400,000 killed by humans each year. They're also spreading south, reaching Costa Rica and Panama for the first time ever, and may soon enter South America, setting the stage for a new wave of coyote expansion. One of the major traits that allows this crafty canid to thrive is their flexible dietary habits. Coyotes are omnivorous, often eating fruit, vegetables, rabbits, rodents, and Canada geese, all of which are easier to come by in American suburbs and cities than wolf favorites like elk, moose, and bison. (Pictured: a wild coyote spotted on the roof of a bar in Queens in 2015). Happily, in all this, conflict with humans and their pets appears to be minimal, with most residents never knowing about the hundreds of coyotes sharing their cities. This is an inspiring example of an animal finding new ways to thrive in the Anthropocene! For more on this Golden Age of Coyotes, see [tinyurl.com/qgeacq4](https://tinyurl.com/qgeacq4) and [urbancoyotereseach.com/](https://urbancoyotereseach.com/). For more on the Queens pic, see [tinyurl.com/sptncfz](https://tinyurl.com/sptncfz).

