



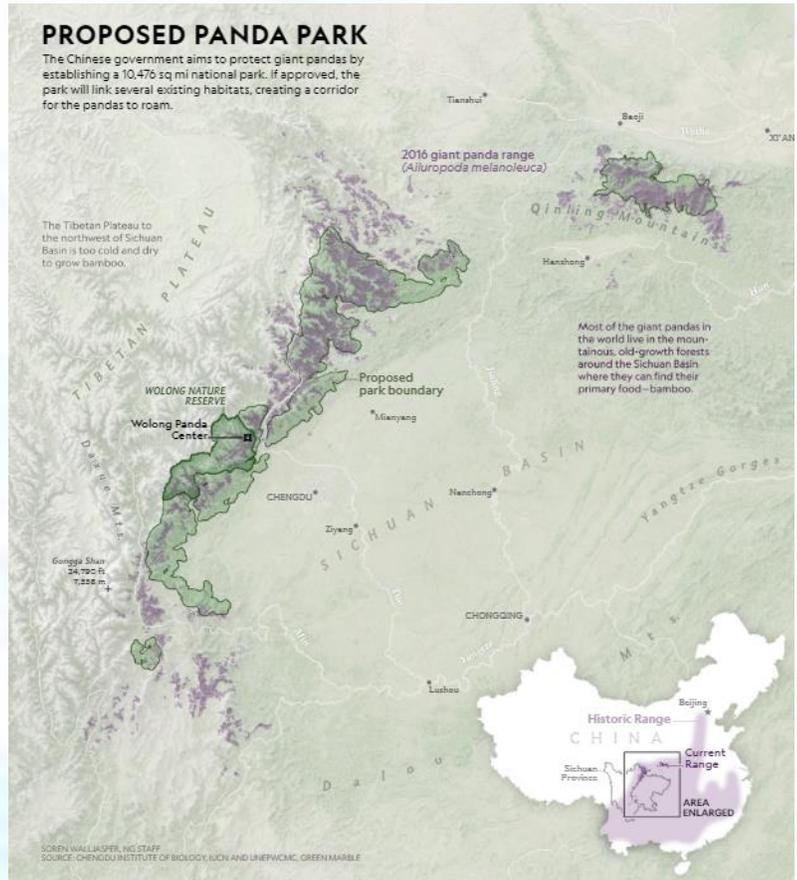
the weekly anthropocene



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

By Sam Matey, May 15 2019

China. In an inspiring step forward, the Chinese government is finalizing plans to create a massive “Giant Panda National Park” as part of a broader effort to forge a national park system to match America’s. (Now that’s a productive example of nationalistic competition!). Giant Panda National Park (pictured) will cover 10, 476 square miles, an area slightly larger than Albania and over three times the size of Yellowstone National Park. More importantly, it includes an array of existing panda reserves such as the famed Wolong Nature Preserve, encompassing the vast majority of the giant panda’s remaining range. It also protects new corridors between these areas, ensuring genetic connectivity. It’ll also allow pandas to follow their bamboo food source as its range shifts due to climate change. This is spectacular news, essentially future-proofing the species! For more, see tinyurl.com/y67t5xsu.



UK. Even in the midst of a political crisis around Brexit, the United Kingdom is quietly emerging as a world leader in climate action. As London was rocked by “Extinction Rebellion” protests urging bolder action to combat climate change, Parliament made the UK the world’s first country to declare climate change a national emergency on May 1, a valuable symbolic gesture. (It’s already inspired Ireland to do the same). From May 1 to May 9, the nation went 8 days without burning any coal (the dirtiest and most carbon-intensive fossil fuel) generating its electricity primarily from lower-carbon natural gas and no-carbon nuclear and wind power. That’s the longest the UK has gone without burning any coal since 1882, when the world’s first coal-fired power plant was built in London! It’s also worth noting that UK’s carbon emissions in 2017 were 43% lower than 1990 levels—a good start! Finally, the UK’s Committee on Climate Change officially recommended a target of net-zero carbon emissions by 2050, with sub-targets to make this possible including all new cars being electric by 2035 and expanding forest cover from 13% to 17%. If adopted, this would be one of the most ambitious (and most sensible) targets in the world. Stay tuned! For more, see tinyurl.com/yx8rlbt9.



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Brazil. Brazil's President Jair Bolsonaro (pictured), inaugurated at the beginning of 2019, was already well known for his homophobic and misogynistic views, support of extrajudicial killings of criminals, nostalgia for Brazil's historical military dictatorship, and (reciprocated) admiration of Donald Trump. Now, he's becoming internationally infamous as the man dismantling Brazil's environmental regulations,



potentially opening up a new frenzy of deforestation in some of the most unique, rich, and vital habitats on Earth. Bolsonaro has slashed funding for IBAMA, the Brazilian environment ministry, and has fired 21 of its 27 regional superintendents responsible for fighting deforestation, replacing many of them with pliant military officers. He's also transferred authority for indigenous lands from FUNAI, the indigenous lands ministry, to the notoriously institutionally anti-indigenous Agriculture Ministry. Bolsonaro's administration is also auctioning off seven new offshore oil fields despite warnings that a spill would be ecological catastrophic. His foreign minister, Ernesto Araújo, has stated that he believes climate change to be a Marxist plot. His Presidential Decree 9760, enacted on April 11th, created Orwellian "conciliation centers" for those hit with environmental fines, which will have the authority to unilaterally cancel fines at will, as well as establishing three more opportunities for appeal. This essentially tells any company considering illegal deforestation to go ahead, as they can appeal into infinity and any fines might just be canceled anyway. Bolsonaro also recently condemned IBAMA's (perfectly legal) action to seize and burn the vehicles of illegal loggers in a protected area without even acknowledging that the criminals had been doing anything wrong. On May 8, eight former Brazilian environment ministers condemned Bolsonaro's destructive policies, as the President unveiled a new plan to strip protections from the Tamoios Ecological Station to develop a "Brazilian Cancun." Notably, Bolsonaro was once fined for illegally fishing in that very same protected area. Most recently, on May 10, Bolsonaro fired Alfredo Sirkis, head of the Brazil Forum for Climate Change, apparently for daring to attempt to organize state-level climate action. In short, he's taking a hammer to vital protections meant to safeguard his nation and the world.

If there's one bright spot here, it's that Bolsonaro has backed down on some issues (he had reportedly also planned to quit the Paris Agreement and merge the Agriculture and Environment Ministries entirely!) due to international pressure, particularly from the EU (a major consumer of Brazilian soy and beef). Still, given the immense importance of Brazil's Amazon rainforest, Jair Bolsonaro is likely the number one threat to the world's biodiversity and climate stability right now. It is to be hoped that, like Trump, he will inspire a pro-environmental backlash, and that his destructive actions will be challenged in court. For now, all we can do is wait and hope that this insanity will pass, in Brazil as well as America.

For more, see <https://tinyurl.com/y4qam9gz> and <https://tinyurl.com/y3td74z7>.



By Sam Matey, May 15 2019

New Solutions: Shipwreck Havens. A

new study published in *Nature*

Communications Biology has found that

tropical and subtropical fish, such as bluehead

wrasses, the blue chromis damselfish, and the

yellowmouth grouper, are abundant in

artificial reefs (such as shipwrecks, pictured)

off the North Carolina coast. Interestingly, the

study found that these fish strongly prefer

artificial reefs, especially ones in deep water,

to natural reefs. Researchers hypothesize that

the fish prefer artificial structures because of

their increased structural complexity, or

possibly more tasty zooplankton living there,

as plankton and fish-eating fish preferred

artificial reefs to a greater extent than herbivorous fish. "The artificial reefs created by these structures may be acting as

stepping stones for fish that are moving northward and living at the edge of their geographic range, or beyond it, in

search of suitable habitat," said marine biologist Dr. Avery B. Paxton of Duke University, lead author of the study (Dr.

Paxton, incidentally, was also involved with the sand tiger shark citizen science program covered in an earlier issue of

this newsletter, and is quite the marine biologist rising star!). "Globally, there is broad evidence that many tropical fish

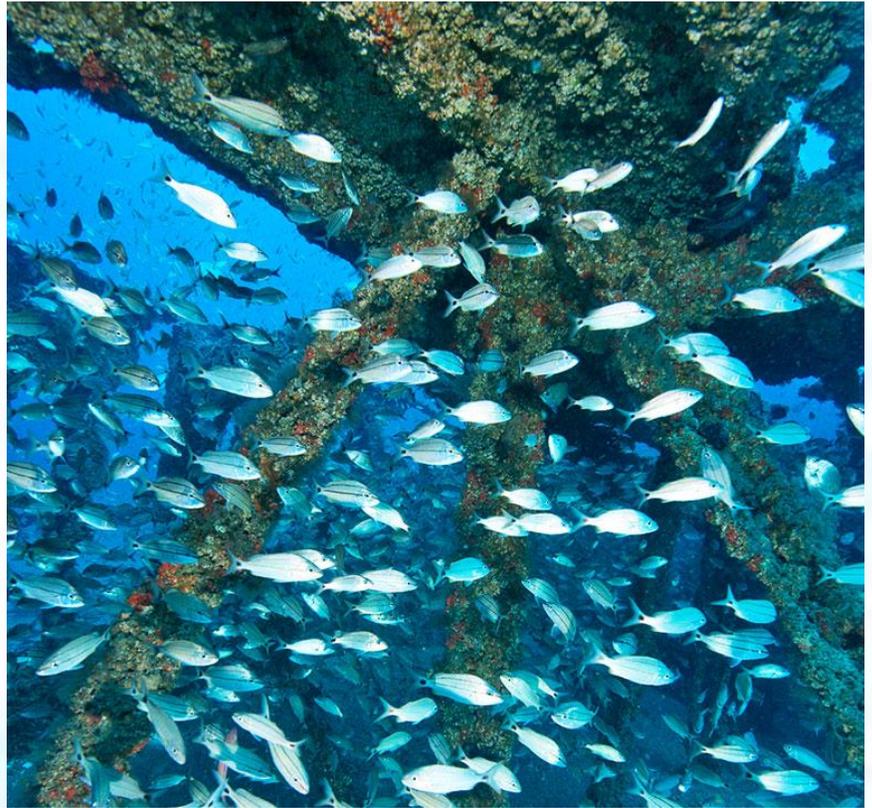
species are shifting their ranges poleward and to deeper waters in response to changing ocean conditions, and what we

see on these reefs seems to fit that pattern," she continued. In short, these human-created reefs appear to be offering

these tropical fish hospitable halfway houses to serve as steppingstones to new habitat in warming waters. As the

Eastern seaboard is positively littered with shipwrecks, this could serve as a vital pathway to ensure the safe dispersion

of climate migrant species. Great news! For more, see tinyurl.com/y5b36eoa and averypaxton.org.



New Solutions: Endlessly Recyclable Plastic. In an awesome new innovation, researchers at the US DOE's

Berkeley Lab have created a form of plastic that can be disassembled and restructured at the molecular level. This "PDK"

plastic thus could be recycled over and over, potentially for eternity. Wow! For more, see tinyurl.com/y4db38gg.



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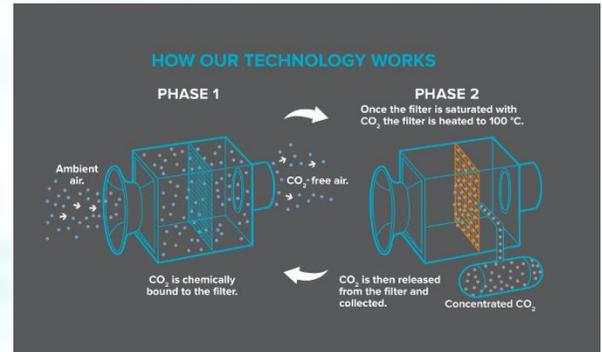


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New Solutions: Air Conditioners as Aerial Oil Wells?

Generally, this newsletter reports on actions and discoveries that are already occurring or at least have workable prototypes. However, one recent proposal is just such an awesome idea that we have to share it. Researchers publishing in *Nature* have proposed a way to unite air conditioners with direct air capture technology. This sounds abstract, but it brings together two really important issues. First, air conditioners are a major cause of concern for many climate scientists. They're energy intensive, but as the world warms, demand for them will increase. This has sparked concerns of a feedback loop in which more ACs are needed in a warmer world, increasing emissions further, warming the world further, and so on. Second, "direct air capture" (DAC) is an emerging technology that uses a complex chemical process to extract CO₂ from the atmosphere and turn it into concentrated gas, which can either be used as fuel for vehicles that are hard to electrify (like planes and ships) or simply buried as part of a negative emissions strategy. It's already being pursued commercially by several companies, such as Climeworks in Switzerland and Iceland and Carbon Engineering in Canada, that are operating functioning commercial DAC plants. (Pictured: Climeworks' schematic of their DAC technology). The new research paper, "Crowd oil not crude oil" propose fitting commercial air conditioners with DAC filters and electrolyzers, enabling ordinary citizen to have their own "aerial oil wells," generating fuel on an individual household level. The researchers calculated that the ACs of Germany's Frankfurt Fair Tower, if so converted, could "capture 1.5 metric tons of CO₂ per hour and produce up to 4,000 metric tons of fuel a year." This is amazing! Here's hoping it works. For more, see tinyurl.com/y3ggty44. For the full paper, see nature.com/articles/s41467-019-09685-x.



Mercedes-Benz. Auto behemoth Mercedes Benz announced a massive new "Ambition 2039" on May 13th. They plan to make all of their passenger cars sold (although not their commercial buses and trucks) carbon-neutral by 2039, ensure that 85% of their cars are being recycled by 2039, and to make all of its manufacturing plants carbon-netural by 2022. The new initiatives will rely on electric vehicles and wind power. "We have set a clear course to help prevent further acceleration of climate change," said the company in a statement. This places MB ahead of Volkswagen, which recently pledged to attain carbon neutrality by 2050, in the climate action rankings, but behind Volvo, which will stop producing gas-powered cars this year, 2019! This is spectacular evidence of a much-needed industry-wide transformation! For more, see tinyurl.com/y4ol6qrt.

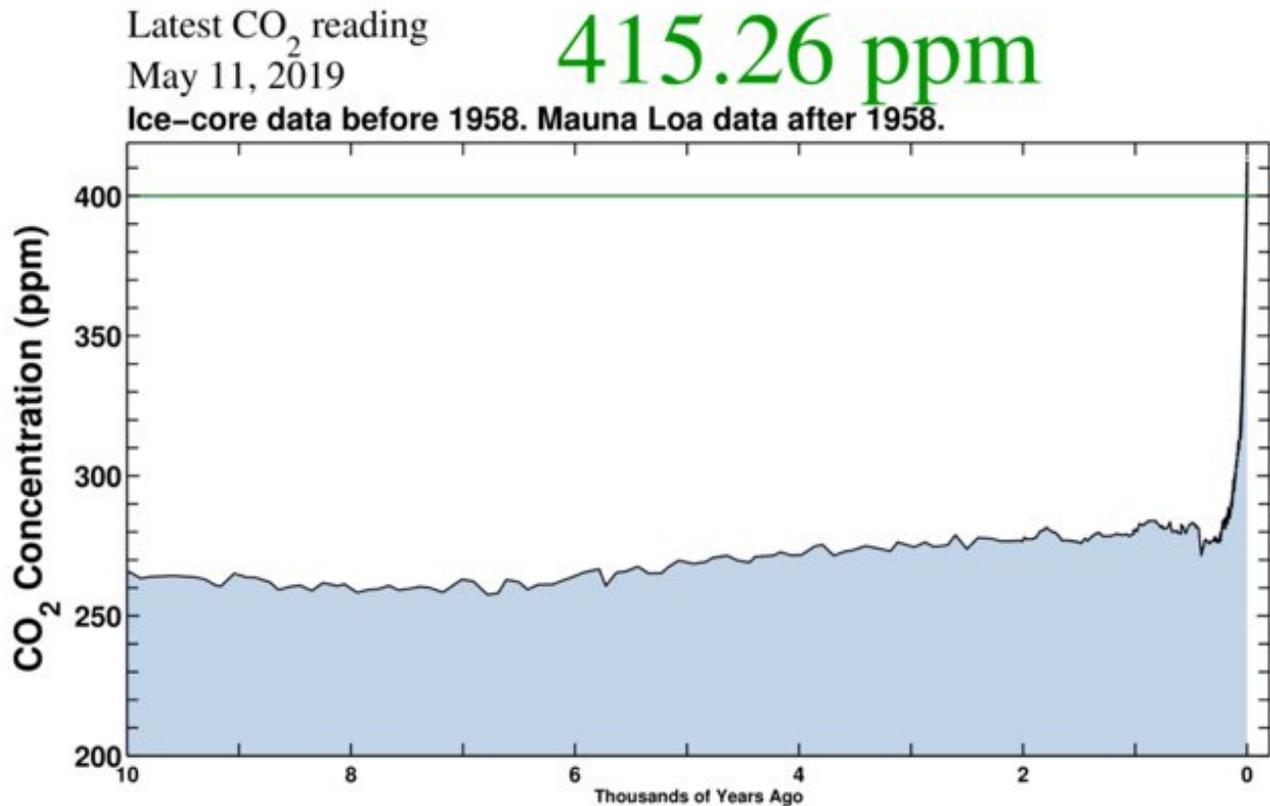


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Earth. On May 11th, the Mauna Loa Observatory recorded an atmospheric carbon dioxide concentration of 415.26 parts per million (ppm). For context, CO₂ levels hovered between 250 and 300 ppm for all of human history until the 20th century (see graph), hit 300 ppm in 1910 as the Industrial Revolution revved up, and hit 400 ppm just 3 years ago, in 2016. The last time Earth had CO₂ concentrations this high, it was three million years ago during the Pliocene Epoch and there were beech forests in Antarctica. This is truly an entirely new world we're living in. For more, see tinyurl.com/y3rruz2u.

Two New Snakes. Recently, scientists have described two new snake species:

Trimeresurus arunachalensis, the Arunachal pit viper, from the state of Arunachal Pradesh in India (pictured, with its lovely red scales), and *Aspidura desilvai*, De Silva's rough-sided snake, from the Knuckles Massif in Sri Lanka. Awesome! For more, see tinyurl.com/yyq9ecgr and tinyurl.com/y5gegg8u.

