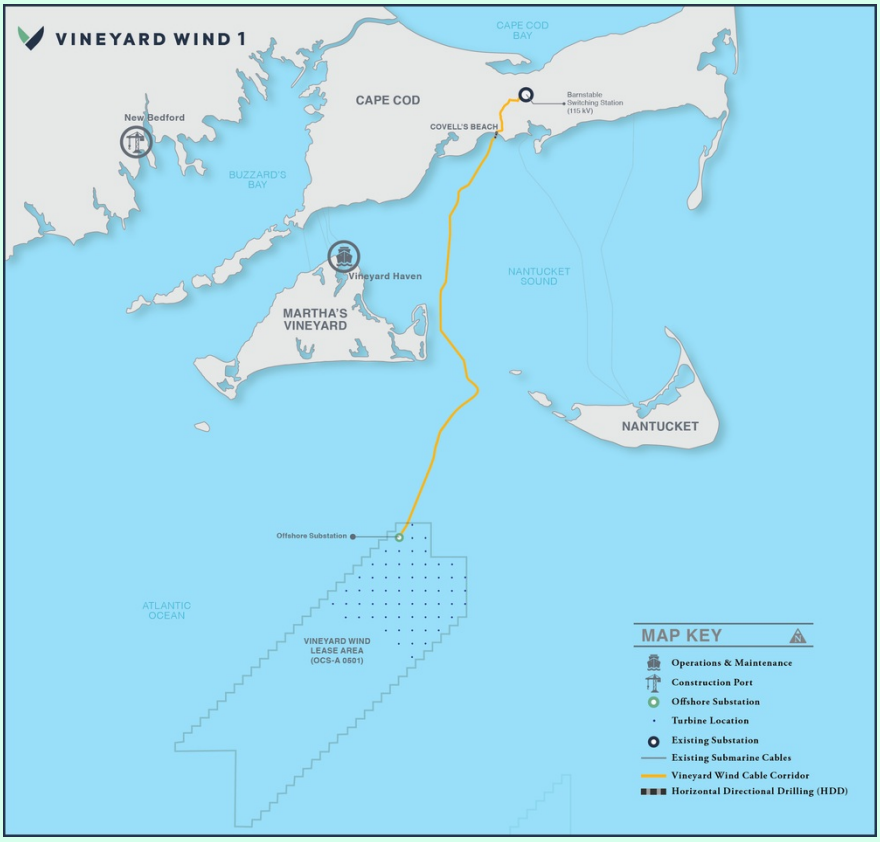
the weekly anthropocene

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

May 19, 2021

Massachusetts



The Biden Administration has approved the construction of the Vineyard Wind project off Massachusetts, set to be America's first large-scale offshore wind farm. Vineyard Wind will consist of 84 giant turbines about 12 nautical miles off the coast of Martha's Vineyard (pictured) and will produce 800 megawatts of energy, enough to power 400,000 homes and businesses. It is also estimated to create 3,600 new jobs. Construction will begin later this year, and electricity generation will start in 2024. This epic Green New Deal-esque project is only the beginning; two New York offshore windfarms are nearing approval, and many more are under development up and down the East Coast, including in Maine! Great news!

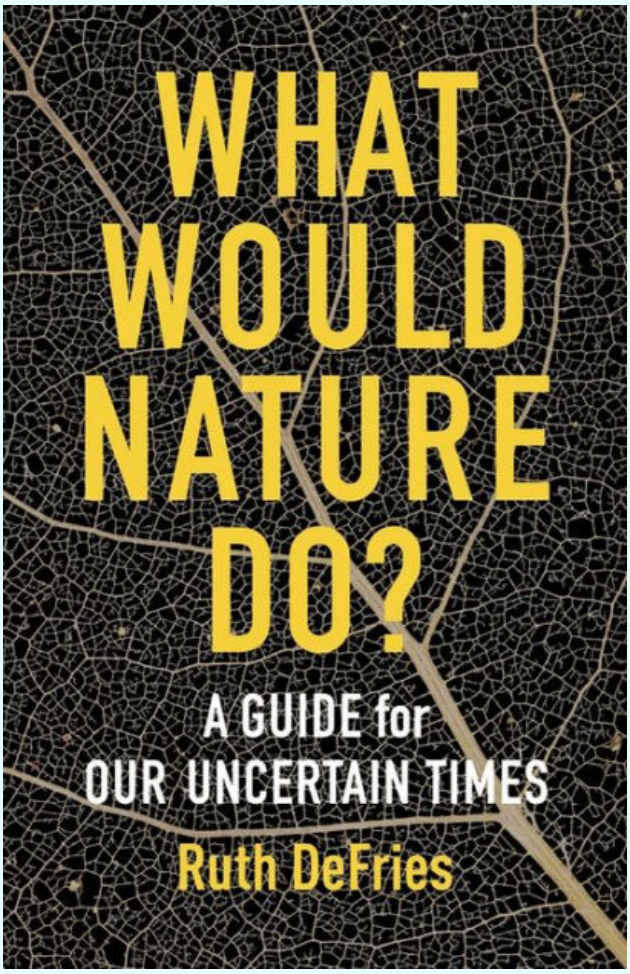
American Meat Production

A new study published in the *Proceedings of the National Academy of Sciences* has calculated that agricultural air pollution causes 15,900 premature deaths annually in the United States alone-and that the vast majority of these are due to animal-based agriculture. Agricultural air pollution includes aerosolized manure, fertilizer particles blowing into the air, and dust from plowing land, often described under the umbrella air pollution term of "fine particulate matter," or PM 2.5. The researchers also calculated that animal-based agriculture, for meat and dairy, was responsible for 80% of this pollution and these premature deaths, due to the manure and the high fertilizer use in growing the crops that the animals eat. As with carbon emissions, red meat is the worst: the study calculated that "per serving, the average air quality-related harm of red meat to human health is two times greater than that of eggs, three times greater than those of dairy products, seven times greater than those of poultry, 10 times greater than those of nuts and seeds, and at least 15 times greater than the average of other plant-based foods." Alongside health, animal suffering, and carbon emissions, preventing air pollution deaths is yet another great reason to eat less red meat!

Australia

The Australian government has announced that it will spend $5.4 million to create and designate two new marine protected areas (MPAs), around Christmas Island and the Cocos/Keeling Islands (see map). Together, the new MPAs will cover 740,000 square kilometers of ocean: a vast expanse, larger than the Australian state of New South Wales or the American state of Texas. The Christmas Island waters are the only known spawning ground of the southern bluefin tuna, and are critical habitat for whale sharks. While the exact level of legal protection granted is yet to be determined, Australia has a strong record in its marine parks, and this is likely to be an excellent step for ocean conservation. Australian Environment Minister Sussan Ley said "The Christmas and Cocos Islands boast some of the most fascinating and unique ecosystems on Earth and this is about extending that protection to the surrounding waters of the Indian Ocean...This is an international marine treasure on Australia's doorstep, one that is from a scientific perspective relatively undisturbed and undiscovered...We know that this is a critical area for spawning bluefin tuna and, while we are yet to unlock its many other secrets, it is important that we protect the ocean's unique habitats and the species that rely on them." Good news!

The Weekly Anthropocene Book Review: "What Would Nature Do?" by Dr. Ruth DeFries



In "What Would Nature Do?", Columbia University professor of ecology and sustainable development Dr. Ruth DeFries zooms through the stories of human civilization and the nonhuman world to identify key strategies that help systems, from organs to individual creatures to nation-states, survive disruption. It's a slim volume, at 6 chapters and under 200 pages, but positively packed with fascinating history, science, and analysis. The "wow, that's awesome!"-moment-to-page ratio is very high. Dr. DeFries' writing is delightfully playful and variegated, willing to incorporate in-depth analogies and examples from cases as diverse as Isaac Asimov's fictional Galactic Empire, real-world economist Elinor Ostrom's research, stock market crashes, insect hives, Biosphere 2, and anole evolution.

The book centers on four attributes that are characteristic of successful, resilient systems in both nonhuman and human realms. The first is self-correcting features, automatic procedures that kick in when a mistake is made or a problem arises. Animal bodies evolve dozens of these, from sweating when it gets hot to the pancreas releasing insulin when blood sugar is high. Arguably, democratic elections are self-correcting features for human societies: when leadership is really, really screwing up, they tend to get kicked out.

Diversity, "hedging one's bets," is another near-universal helpful feature: species with more genetic diversity are more likely to survive catastrophes and successfully evolve new survival strategies. Ecosystems with lots of different species-from rainforests to human gut microbiomes-are less likely to collapse when faced by an external threat like a drought or antibiotics. And human agricultural systems with a variety of cultivars of food plants are less likely to be devastated by a single new pest or disease.

The book's next example is decentralized networks. Most plants' leaves use decentralized networks of nested loops-within-loops to transfer water and nutrients from place to place, ensuring that if one vein gets broken or bitten into there'll be

plenty of ways to loop around it without leaving any patch of leaf high and dry. Internet routing uses a very similar protocol, sending packets of information down many different paths so that if one node is taken down the whole system is still operational. However, leaves from lineages plants that evolved earlier, like ginkgoes, rely on a "hub and spoke" model with a lot of straight-line veins radiating out from a central point in the stem. This means that just one tear or insect bite can take out a vein that's the only source of water for a big swathe of the leaf, with no backups. Dr. DeFries makes the insightful point that global food distribution has the exact same problem of relying on a few key paths. When the Bush Administration tried to promote corn-based ethanol as a fuel in the late 2000s (a bad idea for many, many reasons), the flow of edible corn leaving the United States decreased as more was made into ethanol. There were no backup sources of corn for the world, leading to food riots in 2008 ranging from Mexico to Haiti to the Philippines.

And finally, building things from the "bottom-up," with on-the-ground individuals making small-scale decisions that add up to the finished product, almost always works better than imposing a "top-down" plan and expecting all sub-units to make it happen. Bottom-up decision making is how termites and ants build, with workers following pheromone trails to place tiny pellets atop those left by previous workers. It's also how healthy markets work, with individual vendors making thousands or millions of micro-decisions about how, where, and at what price to sell their product. In a shock for this writer, Dr. DeFries posits that this is also what led to the Paris Agreement being enacted in 2015 when climate talks at Copenhagen in 2009 failed: in Copenhagen, negotiations broke down when nations couldn't agree on what global emissions targets to set, but the Paris talks agreed on the broad shared goals and allowed each nation to set their own targets. That's led to some issues with countries like Brazil and Australia trying to fudge their numbers, but it also made possible human civilization's best-ever platform for fighting the climate crisis.

In sum, "What Would Nature Do?" is a fascinating and mind-expanding book that helps the reader see the world in a different way, with more interconnectivity and similarities across fields of inquiry and scales of existence than before. Read it-you won't regret it!

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