



the weekly anthropocene



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

By Sam Matey, June 10, 2020



Sea Turtles. Two recent studies have shed new light on sea turtles, the seven living species of a taxonomic group that originated in the Cretaceous. One research team used drones to track green sea turtles (*Chelonia mydas*) coming to nest at Rains Island, Australia, the world's largest green sea turtle rookery. This method was a notable improvement over manual counts from the shore, which now appear to have been unintentionally under-counting, and also produced some incredible images of this great natural event (see above-those are all sea turtles!). The drones counted an incredible 64,000 sea turtles coming to nest over the course of the season-spectacular news! For more, see tinyurl.com/SeaTurtleDroneCounts. A second study revealed that each of those sea turtles may have been a tiny ecosystem in itself! An unrelated research team used sponges to carefully collect any possible tiny wildlife from the shells of 24 loggerhead sea turtles (*Caretta caretta*) that had come in to nest on the beaches of St. George Island, Florida, making sure to use only red-tinted headlamps to minimize disturbance to the turtles' vision. Once they checked those samples under the microscope, they found an unexpected extravaganza of diversity. The average loggerhead sea turtle had 34,000 individual meiofauna (animals smaller than one millimeter) on its shell, and one individual had nearly 150,000! This wildlife included worm-like nematodes, shrimp-like amphipods, crustacean larvae, and jellyfish-like predaceous hydroids. "It is a hugely diverse little microscopic world that is interacting, that we know nothing about" said Dr. Jeroen Ingels, lead author of the new study. What an absolutely incredible discovery-each shell its own little submerged Serengeti. For more, see tinyurl.com/SeaTurtleShellLife.

Furthermore, both of these new studies adding to humanity's understanding of these magnificent animals come as strong conservation efforts appear to have yielded a multi-year increase in sea turtle numbers, across many species (see tinyurl.com/SeaTurtleRecovery for more). If we continue conservation efforts and don't screw up the oceans too badly, these incredible creatures may thrive for millions of years more!



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Pangolins. For years, the world's eight species of pangolins, the only mammals with scales, have been devastated by a massive trade in their scales and other body parts for use in traditional Chinese medicine (TCM). (Pictured: a baby Philippines pangolin, *Manis culionensis*). Now, after shutting down "bushmeat" markets earlier in the year after the rise of the zoonotic COVID-19 pandemic, the Chinese government has taken two major



steps to protect the pangolin. On June 5th, the pangolin was recategorized as a level one protected species, and on June 9th, it was reported that pangolin scales had been dropped from the 2020 list of state-approved ingredients in traditional Chinese medicine. This is a huge deal, as TCM is both highly regulated, with the government controlling what is and is not able to be sold as TCM, and a major driver of the demand for pangolin body parts. "Banning pangolin scale powder out of Chinese pharmacopoeia means literally that there is and will be no more demand," said Professor Ray Jansen, chairman of the African Pangolins Working Group. He continued "Once it's banned, I think it's going to be very, very difficult to make it commercially available in China...it's a massive turning point in terms of the conservation of all eight species of pangolins." Spectacular news! For more, see tinyurl.com/PangolinProtections.

United Kingdom. In awesome news, Britain has gone two full months without burning coal for electricity! The coal hiatus started on April 10, 2020, reached historic one-month and then two-month marks, and is still going. The UK is truly in the midgame of the renewables revolution now. A rapid buildout of wind and solar is keeping the lights on: Britain now has the world's largest offshore wind energy industry. (Pictured: the Gunfleet Sands offshore wind



farm in the northern Thames Estuary). In 2010, wind and solar provided just 3% of the UK's power, they now provide 37%. Coal provided 40% of the UK's power as recently as 2013, the first entirely coal-free day since the 1800s was April 17, 2017, we just passed a two-month no-coal stretch, and the UK is now planning to retire all coal plants, permanently ending the contribution of coal, the dirtiest fossil fuel, to its energy system, by October 2024. This is a truly historic moment: the country that launched the world's first large-scale coal-burning industries during the Industrial Revolution is now in the vanguard of leadership towards a cleaner, greener future. Coal power has caused hundreds of thousands of deaths from air pollution and helped cause the escalating climate crisis. Britain provides a model transition away from coal for the world to follow! For more, see tinyurl.com/BritainNoCoal and tinyurl.com/BritainRecord2Months.



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Brazil. The Brazilian Amazon, and its indigenous peoples in particular, are under brutal, near-genocidal attack from both rapidly spreading COVID-19 and the Bolsonaro government's green light for mass deforestation. As of June 7, the official numbers stated that 248 indigenous persons had died from and 2,642 had been infected by COVID-19, but experts fear the real number could be three times higher. Nine elders of the Mundurucu people have died of COVID-19 since May 9, a devastating loss of leaders, keepers of traditional knowledge, and loved ones for the 14,000-strong indigenous nation. (Pictured: elder Acelino Dace, who died on June 3rd age 77). And deforestation continues to accelerate under the openly pro-logger Bolsonaro, with recent data revealing that May 2020 was the 14th straight month of increasing deforestation and that deforestation for 2020 is tracking 83% ahead of the toll in 2019. For more, see tinyurl.com/AmazonDeathToll and tinyurl.com/RisingDeforestation.



Microplastics. A shocking new study published in the prestigious journal *Science* has calculated that hundreds of tons of microplastics are deposited in America's protected areas each year, implying vast movement of microplastics through the atmosphere. The research team took samples of atmospheric particulates, everything falling from the air from dust to pollen, from 11 protected areas across the American West (for example, Rocky Mountain National Park) over 14 months. They were utterly astounded by what their data revealed: 4% of the atmospheric particles from the most remote sites were plastic. Deposition rates averaged 132 plastic particles per square meter per day, which works out to over 1,000 metric tonnes of plastic, 143 million water bottles' worth, falling from the sky on western American protected areas every year. "We were shocked at the estimated deposition rates and kept trying to figure out where our calculations went wrong," said Professor Janice Brahney, lead author of the new study. "We then confirmed through 32 different particle scans that roughly 4% of the atmospheric particles analyzed from these remote locations were synthetic polymers....Several studies have attempted to quantify the global plastic cycle but were unaware of the atmospheric limb," Brahney continued. "Our data show the plastic cycle is reminiscent of the global water cycle, having atmospheric, oceanic, and terrestrial lifetimes." This is quite frankly mind-boggling, a massive Anthropocene impact on a planetary scale. Even the climate crisis is fundamentally caused by humans disrupting the Earth's carbon cycle: what this discovery implies is that mass manufacturing and use of plastic has created an entirely new biogeochemical cycle, with tiny plastic particles carried everywhere in the world by land, sea, and air. The long-term implications are unknown. For more, see tinyurl.com/ThePlasticCycle.