



the weekly anthropocene

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



By Sam Matey

COP 24: The Katowice Climate Conference.

December 2018 also saw the United Nations' 24th annual climate talks take place in the city of Katowice, Poland.

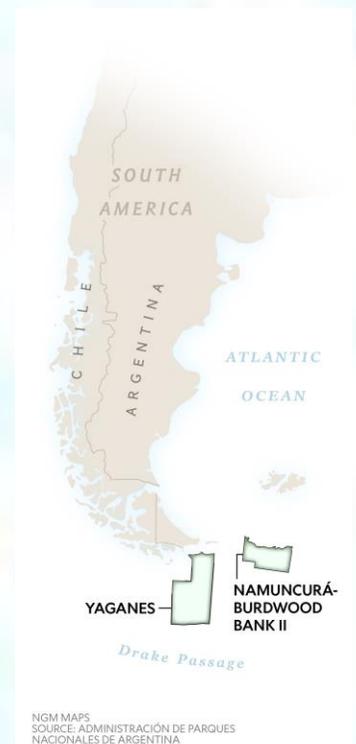
The conference built on the landmark Paris Agreement of 2015 by agreeing on standards for counting greenhouse gas emissions across nations and that rich nations have some responsibility to pay for poorer nations' adaptation efforts.

Also, Ukraine announced new emissions reduction targets, and Israel, Senegal, and the Australian cities of Melbourne and Adelaide committed to phasing out their use of coal, the dirtiest fossil fuel. Despite efforts by the Trump Administration's US delegation, Russia, Kuwait, and Saudi Arabia to promote fossil fuels and discount the importance of climate science, the meeting was productive. (Pictured above: conference chairman Michal Kurtyka dancing on a table as the parties reached agreement). However, the current set of nationally determined contributions (NDCs) to emissions reduction still put the world on track to warm by 3 degrees Celsius, despite numerous reports warning of the dangers of 2 °C or even 1.5 °C of warming. (We are already at 1 °C of warming above pre-Industrial Revolution temperatures). More news as it develops. For more, see goo.gl/a4DBuh.



Argentina: New Protected Areas.

On December 5th, 2018, the Congress of Argentina created Ibera National Park, protecting approximately 617 square miles of grassland, forest, and marshes home to over 4,000 species of plants and animals. However, this laudable conservation action was merely an amuse-bouche compared to the South American nation's next step: on December 12th, 2018, Argentina created two new enormous marine protected areas (pictured in map, right). The Argentinian congress also voted in a new legal framework to enforce bans on extractive industries, like fishing, in the new marine parks. Yaganes and Namuncura-Burdwood Bank II together comprise over 37,000 square miles of ocean and are home to giant kelp forests, cold-water coral reefs, massive underwater mountains and canyons, three species of penguin, sea lions, fur seals, and southern right whales. This is great news for marine conservation and will help ensure that these natural treasures survive in the Anthropocene. Rock on, Argentina! For more, see goo.gl/y9LrN8.





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Bangladesh: The Mro Parabiologists. The Chittagong Hill

Tracts of Bangladesh are one of the few undeveloped regions of that densely populated country, home to wildlife including tigers, gibbons, and the rare great hornbill. It's also home to a variety of distinct ethnic groups with their own culture and customs, including the Mro people.

Since 2015, Bangladeshi conservation biologist Shahriar Caesar

Rahman has been hiring Mro as “parabiologists” to document and

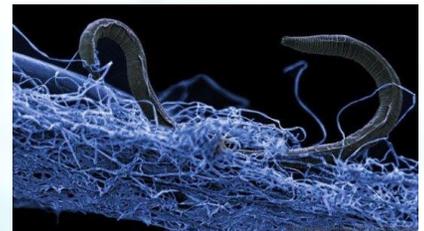
study the incredible diversity of their homeland, as well as working to protect it for the future. Despite having no formal scientific training (or, in many cases, any formal education), Mro parabiologists have learned to set up camera traps, take GPS data, conduct surveys, and take external measurements of animals (pictured, above). The parabiologists, now numbering 10, are currently working to protect hornbill nests, cultivating bamboo to reduce use of forest trees for firewood, running pioneering captive breeding centers for the rare Arakan forest turtle and Asian giant tortoise, and acting as ambassadors to educate their community about the threats to local endangered species. They are routinely named as coauthors on the scientific papers documenting their discoveries. Rahman’s organization, the Creative Conservation Alliance, has also entered into a conservation agreement with six Mro villages in which they have built schools in each village and worked to create a market for Mro jewelry crafters in return for restrictions on hunting. This is a spectacular program that unites indigenous knowledge with modern conservation biology in a program that benefits the human and wildlife community of the Chittagong Hill Tracts. Great news! For more, see goo.gl/fhijzt.



New Realms: Deep Life. On December 10th, scientists with the international

Deep Carbon Observatory reported an array of (literally) groundbreaking discoveries. For years, researchers around the world have been drilling into hundreds of sites in the seafloor and into terrestrial mines and boreholes to

investigate the “deep biosphere”: the hidden ecosystem of microbes and microinvertebrates living in the bowels of the Earth. (Pictured, a nematode worm amid a biofilm of microbes, found 1.4 kilometers beneath a South African gold mine). They have now approximated the size of this deep biosphere: 2 to 2.3 cubic kilometers of life-forms (about two times the volume of all oceans combined) weighing 15 to 23 billion tonnes (245 to 385 times the carbon mass of all humans combined), with an average of 7.5 tons of life per cubic kilometer of Earth’s subsurface. This is an absolutely mind-boggling glimpse into what is effectively an alien world beneath our feet. For more, please see goo.gl/P85iaq.





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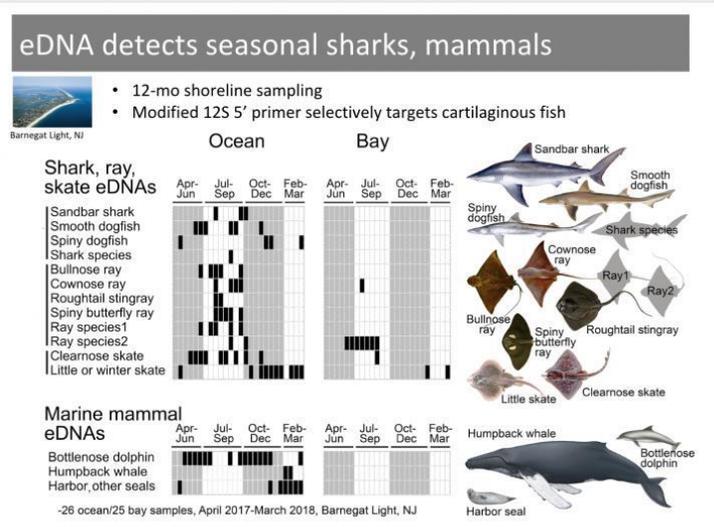


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New Tools: GoFish eDNA. In a fascinating breakthrough in environmental genomics, researchers at Rockefeller University have created a tool that can identify what creatures live in a body of water by analyzing DNA fragments in a water sample. The “GoFish eDNA” tool can isolate tiny fragments of “environmental DNA” left behind by fishes’ shed skin cells from a sample of water. Environmental DNA, for aquatic and terrestrial animals, was already a hot new field in biology, but this process represents a substantial technological

advancement. GoFish eDNA can identify species-specific genetic markers, enabling detection of a waterbody’s animal community, in as little as 48 hours-and at a cost of just \$15 per sample for one species and \$8 for each additional species. The potential applications are limitless-in a few years, fishermen or lifeguards could determine the presence of sardines or sharks in a few hours just by collecting a few cups of water. GoFish eDNA will be a boon to scientists as well, allowing them to see the “genetic trails” of all species passing through a waterbody rather than a random sample of those present at a given time. Great news! For more, see goo.gl/QTt3kj.



New Inventions: Air-Cleaning Houseplant. Researchers at the

University of Washington have genetically modified pothos ivy (*Epipremnum aureum*, pictured), a common houseplant, to remove toxins from our homes. Their pothos ivy expresses a protein called cytochrome P450 2E1 that transforms chloroform and benzene, two common toxic compounds that have been linked to cancer, into compounds that the plant can use. (Chloroform becomes carbon dioxide and chloride and benzene becomes phenol).



"People haven't really been talking about these hazardous organic compounds in homes, and I think that's because we couldn't do anything about them," said Stuart Strand, UW research professor. "Now we've engineered houseplants to remove these pollutants for us." The team is currently working to enable the plant to remove formaldehyde, another toxic compound, as well. This is an excellent example of how modern biotechnology can be utilized to help clean our local environments. For more, see goo.gl/W8U5Ww.