

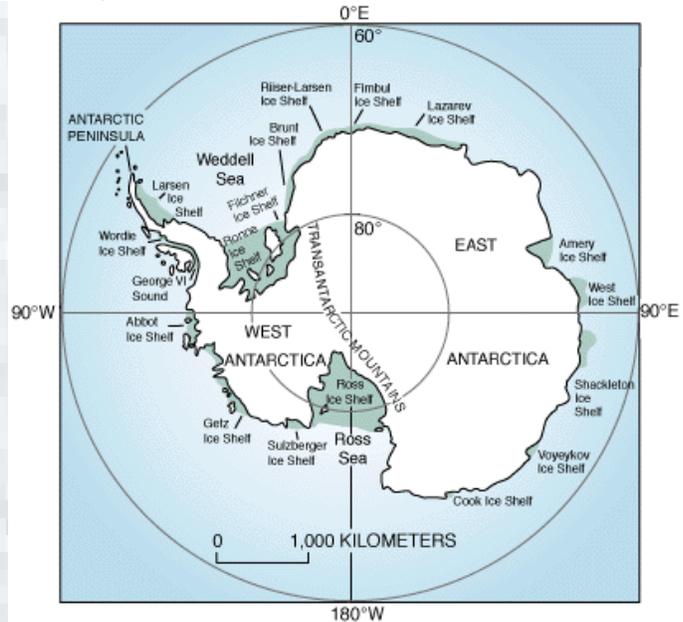


# the weekly anthropocene



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

**Antarctica.** In the past few weeks, two new studies have added greatly to the world's scientific understanding of Antarctica's ice. On June 13<sup>th</sup>, the Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE), a major collaborative assessment of the Antarctic ice sheet, published its findings in *Nature*. 84 scientists from 44 organizations (including NASA, many universities, and the European Space Agency) combined data from 24 satellite surveys to create a comprehensive picture of how the ice sheet is changing. They found that prior to 2012, Antarctica was losing ice at a rate of 76 billion tons per year, resulting in a contribution to sea level rise of 0.2 millimeters per year. However, between 2012 and 2017, the rate of ice loss rose sharply, to 219 billion tons of ice per year. This is resulting in a contribution



to sea level rise of 0.6 millimeters per year. The increase in ice loss is attributed to runaway glacier loss in West Antarctica and a reduction in the growth of the East Antarctic ice sheet. Professor Andrew Shephard, co-leader of IMBIE, says that "According to our analysis, there has been a step increase in ice losses from Antarctica during the past decade, and the continent is causing sea levels to rise faster today than at any time in the past 25 years. This has to be a concern for the governments we trust to protect our coastal cities and communities." As Antarctica stores enough ice to raise world sea levels by 58 meters (or over 190 feet) learning more about how fast it is melting is vital.

However, another new study, this one published in *Science*, has shed light on an unexpected process that could slow the collapse of Antarctica's ice sheets. An international team of earth scientists have discovered that as the West Antarctic Ice Sheet melts, the bedrock beneath it is rising rapidly. This process, called crustal rebound, is fairly normal, but it appears to be happening to an unusual extent in West Antarctica due to unusual "gooeyness" of the underlying mantle. The team estimates that in some places, West Antarctic bedrock could rise up to 8 meters in the next 100 years, potentially holding the ice sheet aloft from the warming seawater that is causing it to melt faster. "It may just buy the world a few extra decades," says Professor Rick Aster, coauthor of the new study. These new studies underscore the fact humanity is changing the Earth to a mind-bending extent-and that the Earth is responding in unexpected ways. For more on the IMBIE results, see [goo.gl/gr6gbo](http://goo.gl/gr6gbo). For more on the bedrock rebound study, see [goo.gl/rEcKda](http://goo.gl/rEcKda).

**Fish.** A new study in *Science* warns that the world's systems of regional fisheries management are being outpaced by climate change, potentially leading to more international disputes over fishing rights. An international team of researchers analyzed 892 fish stocks from around the world and found that if greenhouse gas emissions remain in their current trajectory (which would lead to warmer oceans) at least 70 countries will see new fish stocks in their waters. For more, see [goo.gl/P9u2ZB](http://goo.gl/P9u2ZB).



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**Urban Forests.** A new study published in the journal *Carbon Balance and Management* offers riveting new data on the importance of urban forests. A team of scientists from the University College of



London used LiDAR surveying to determine how much carbon was stored in the trees of the London borough of Camden. “Urban trees are a vital resource for our cities that people walk past every day,” said Dr. Phil Wilkes, lead author of the new study. “We were able to map the size and shape of every tree in Camden, from forests in large parks to individual trees in back gardens. This not only allows us to measure how much carbon is stored in these trees but also assess other important services they provide such as habitat for birds and insects.” The researchers found to their surprise that the forests of Camden are excellent, with the trees of the Hampstead Heath park (pictured) storing nearly as much carbon as a similarly sized area of the Amazon rainforest. This underscores the importance of preserving urban forests, which not only provide valuable recreation areas for humans and critical habitat for wildlife but have now been found to be excellent at sequestering the primary contributor to climate change. Fascinating news! For more, check out [goo.gl/kQcH2d](http://goo.gl/kQcH2d).

**Belize.** The Belize Barrier Reef is the largest coral reef in North America, a UN World Heritage Site composed of 450 sand and mangrove cays. It’s home to sea turtles, manatees, over 500 species of fish, and 65 species of coral, and provides a livelihood to approximately 200,000 Belizeans. In 2009, it was listed as a World Heritage Site in Danger, due to concerns over destruction of the mangrove forests, selling of reef land for private development, and the looming threat of companies lobbying to drill for oil within the reef. Now, thanks to intensive conservation efforts by the Belizean government (including banning all oil drilling in Belize’s offshore waters) the UN has determined that the Belize Barrier Reef is no longer in danger. This kind of strong, civic-driven protection is what coral reefs need to survive the changing oceans of the Anthropocene. Great news! For more, see [goo.gl/8bz85D](http://goo.gl/8bz85D).

**New Inventions: F-Sand.** In a fascinating innovation, a team of biomedical and chemical engineers from Carnegie Mellon University have created a cheap, effective, and easy to make water purification medium. F-sand, originally created by CMU’s Stephanie Velegol, is made from silica particles (sand) bonded to certain proteins extracted from the seeds of the moringa tree (*Moringa oleifera*) a common tropical plant. F-sand bonds to both particulate and organic matter, cleansing water of both microorganisms and inorganic detritus. The f-sand can then be washed out and used again. Now, a CMU team has expanded on Velegol’s work by testing f-sand’s limits. They found that f-sand can be produced quite simply, with the presence or absence of fatty acids in the seed proteins having no effect on efficiency, determined the ideal concentration of seed proteins for use in f-sand, and discovered that f-sand purifies water regardless of the levels of dissolved minerals present (the water’s “hardness”). This research shows that f-sand is a flexible, widely usable, and simple to make water purification method, and puts it one step closer to real-world deployment! For more, see [goo.gl/AmwHHG](http://goo.gl/AmwHHG).



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**USA.** Since January 2017, the Trump Administration has been conducting an unprecedented assault on American public lands, international action on climate change, and the very concept of science-based policies. Now, their agenda has been given a considerable boost by the resignation of Supreme Court Justice Anthony Kennedy, perennial swing vote on the Court. From an environmental perspective alone, the prospect of a Trump nominee replacing Justice Kennedy is extremely disconcerting. Justice Kennedy has been the deciding vote in almost all environment-related Supreme Court decisions in the last 30 years. In the 2009 case *Massachusetts vs. EPA*, Kennedy joined four liberal justices in voting to allow the EPA to regulate climate change-causing greenhouse gases under the Clean Air Act, a decision that laid the foundation for President Obama's fuel-efficiency initiatives and Clean Power Plan. In *Rapanos v. United States*, a 2006 ruling on interpretation of the Clean Water Act, Kennedy also articulated a compromise position on which American wetlands are subject to pollution control, a position that has also guided the Obama Administration's rulemaking on the issue. The Trump Administration has already struck down Obama's Clean Power Plan and is currently tangled up in court over attempting to suspend the Kennedy-inspired wetlands protection rule. Furthermore, in October 2018, the Supreme Court is set to hear *Weyerhaeuser Company v. United States*, a case where the plaintiffs argue that the Endangered Species Act is unconstitutional. With a 5-4 hardline conservative majority on the Court, America's network of environmental law could be gutted. The League of Conservation Voters has promulgated a petition where voters can urge their Senators to vote against any anti-environmental nominee, available online at [p2a.co/RISjo6V](https://p2a.co/RISjo6V). This newsletter urges all citizens to sign that petition and take whatever other action they can to prevent the appointment of a radical anti-environmental Justice.

Disturbingly, the executive and judicial branches of government are not the only ones threatening Americans' natural resources. The House of Representatives Natural Resources Committee has approved a slew of bills aimed at promoting drilling for oil and natural gas on public lands. These bills include a proposal to hand out drilling permits with little to no review (to which only the Interior Secretary could object), proposals to abolish the requirement for drilling permits on private or state land, and, most egregiously of all, a proposal by Wyoming Representative Liz Cheney (daughter of ex-Vice President Cheney) to require protesters to pay extortionate fees for the right of submitting comments on new oil and gas leases-although the oil and gas companies would be exempt from these fees. All this, despite a new study in Science showing that oil and gas facilities are contributing to climate change even more than previously thought (check it out at [goo.gl/LyTrpP](https://goo.gl/LyTrpP)). Although these bills are unlikely to become law, the mere fact that they made it out of committee underscores the reactionary, avarice-driven, and outrageously undemocratic ethos of the current governing political party.

Despite these new attacks, all is not lost. It is too easy to succumb to despair about the prospects of science and science-based policies in this nation, but at its core, America is still a nation that tries to do the right thing. In March, Congress passed (against President Trump's wishes) a budget that included great funding increases for federal programs from advanced energy research to ocean exploration. Renewable energy is still getting cheaper and more widespread. And ordinary American citizens are rising up and taking action in defense of their public lands, their air and water, and their climate. More news as it develops.

For more on Justice Kennedy's environmental legacy, see [goo.gl/vpumYE](https://goo.gl/vpumYE). For more on the terrible new House bills, see [goo.gl/4BXqXR](https://goo.gl/4BXqXR). And for the petition to your Senators, go to [p2a.co/RISjo6V](https://p2a.co/RISjo6V)



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## Heroes of the Anthropocene:

**Signe Preuschoft.** Dr. Signe Preuschoft (pictured), of Germany and Indonesia, is a schoolteacher, but not an ordinary one. Dr. Preuschoft is an expert primatologist who runs the Orangutan Forest School in East Kalimantan (on the island of Borneo), Indonesia. Indonesia's security forces routinely capture young orphans from the critically endangered Bornean orangutan species, victims of the illegal pet trade or humans shooting their mothers in conflicts over crops.



The Forest School trains young orphaned orangutans to survive in the wild, teaching them how to climb trees, recognize edible forest fruits, and eventually become self-reliant (so that they don't turn to potentially unfriendly humans for support in the future). "It's wonderful to work with young living beings that are every day improving," said Dr. Preuschoft. "They are so brave. They always want to make the most of what they have got."

The Forest School has a staff of 19 and 590 acres of forest, thanks to funds provided by the American animal welfare charity Four Paws. In addition to overseeing the orangutan caretakers, Dr. Preuschoft is currently working with the Indonesian government and the local Dayak indigenous peoples to gain the right to use a safe site to eventually reintroduce the school's current "class" of eight young orangutans into the wild. The school's community relations program is working on forming a long-term relationship with the Dayak peoples around the site. "We can try and find a path together with them from the traditional into modern times that doesn't necessitate [destroying] everything," said Dr. Preuschoft. Dr. Preuschoft's Forest School is a deeply honorable and much-needed initiative to nurture, protect, and foster the future of some of humanity's closest relatives. For more on Dr. Preuschoft's amazing work, check out [goo.gl/yNyfHr](http://goo.gl/yNyfHr). Photo courtesy of Four Paws.

**Maine.** On Thursday, July 5<sup>th</sup>, Maine Conservation Voters is organizing a beach cleanup at Portland, Maine's beautiful Eastern Promenade park (pictured). Volunteers will meet up at 5:30 PM at the Fort Allen Gazebo, spend some time cleaning up the park, and then gather for pizza afterwards. This event is a great opportunity to spend time outdoors in the beautiful Maine summer, meet other locals who care about their community, and help preserve a piece of urban greenspace. For more info, email this writer at [Samuel.matey@maine.edu](mailto:Samuel.matey@maine.edu) or text 207-572-7937.

