



# the weekly anthropocene



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

By Sam Matey

## New Connections: Termites Help Protect

### Tropical Rainforests.

In a fascinating new ecological discovery, an international team of researchers used an innovative experiment to find that termites (pictured), often derided as pests, can actually be vital “ecological insurance” for a rainforest ecosystem. The research team investigated the role of termites in the rainforest ecosystem of eight 2500-square meter plots in the Maliau Basin in Malaysian Borneo. They severely



suppressed termite populations in four of the eight plots by spreading toilet paper rolls soaked in insecticide, which the cellulose-eating termites ate voraciously. Then, a chance event changed the course of their study. An El Nino-influenced drought struck Borneo in late 2015 and early 2016, and the termites responded dramatically. Termite populations nearly doubled, possibly because fungi, their primary competitors for decomposing matter, were harmed by the drier conditions. The boosted termite populations dug deep into the soil to fetch water for their nests, greatly increasing the near-surface soil moisture of the entire forest. The net result was that seedlings transplanted into the termite-rich forest plots had a 51% higher survival rate than seedlings in the termite-less plots, indicating that the termites had substantially helped the entire rainforest ecosystem survive the drought. “Whilst there has been some work exploring how severe drought affects plants in tropical rainforests, our study shows for the first time that having termites helps protect forest from the effects of drought,” said ecologist Professor Kate Parr of the University of Liverpool, coauthor of the new study. “Termites might only be small but collectively their presence can help reduce the effects of climate change in tropical systems.” This fascinating study describes a new ecosystem feedback in which a species’ response to climate shifts can help protect an entire forest. Unexpected connections like these will likely be a vital part of how habitats across the world adapt to the Anthropocene. For more, check out [goo.gl/TQ6dQN](https://goo.gl/TQ6dQN) and [goo.gl/jF38za](https://goo.gl/jF38za).

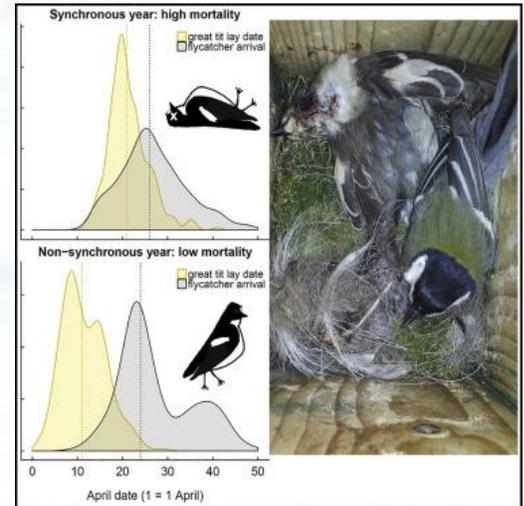
## New Climate Change Effects: Warming Oceans.

A new analysis has found that the oceans are warming faster than previously thought. The researchers used data from the Argo network of autonomous floats, among other sources, to conclude that ocean warming is accelerating at a rapid pace. They calculated that the world’s oceans absorbed a mean of 5.46 zettajoules of heat per year between 1958 and 2017 but are projected to absorb 23.78 zettajoules per year for the next 60 years. This is sobering and consequential news. For more, see [goo.gl/SUZHuz](https://goo.gl/SUZHuz) and [goo.gl/wgfx3r](https://goo.gl/wgfx3r).



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**New Climate Change Effects: Bird Conflicts.** A new study published in *Current Biology* has described a strange and shocking new effect of climate change. Every year, pied flycatchers (*Ficedula hypoleuca*) migrate from Africa to find breeding grounds in the Netherlands. However, as European winters grow warmer due to climate change, great tits (*Larus major*) are shifting their breeding seasons earlier, resulting in higher competition for nesting spaces and caterpillars (the favorite food of both birds) between the two species. The study found that this results in spikes in fatal competition between great tits and pied flycatchers, with up to 10% of all pied flycatcher males being killed by great tits in years with especially mild winters. (Pictured: a great tit that has just killed a flycatcher). Fortunately, this does not appear to be harming the flycatcher population, as most of the casualties are “surplus males” that were unlikely to breed anyway. This gruesome saga is an example of how climate change won’t just cause linear, predictable global warming, it will cause “global weirding.” We’ll be seeing many more such crazy stories as the Anthropocene progresses. For more, see [goo.gl/rebir5](http://goo.gl/rebir5).



**New Senses: Plants’ Use of Sound.** Over the past few years, humanity’s knowledge of the plant kingdom’s capabilities has greatly expanded. We now know that trees of different species can exchange resources through fungal webs between their roots, that plants under attack by insects can pump out anti-insect chemicals that also warn nearby plants, and that some plants can sense the chewing of insects on their leaves and produce defensive chemicals in response. Now, a research team at the University of Tel Aviv has produced perhaps the most mind-bending result of all: that earless, brainless, mouthless plants can both hear and create sound. First, the Tel Aviv team found that beach evening primroses increased the concentration of sugar in their nectar by 20% when exposed to recordings of a bee’s wingbeats, indicating that this species actively listens for pollinators and makes themselves more attractive in response. The team then used laser imaging to find that the petals vibrated when hit by the wingbeat sounds, channeling the sound deeper into the plant, with the flowers essentially acting as an ear. In a separate study, the team also found that tobacco and tomato plants produce ultrasonic “pops” of sound that may serve as indicators of their health. Although the papers describing these results have yet to be peer-reviewed, this research revolutionizes our understanding of plant biology and serves as a reminder that we are still only beginning to understand the wondrous tapestry that is Earth’s biosphere. For more, check out *The Atlantic’s* in-depth article on plant acoustics at [goo.gl/kJcvFS](http://goo.gl/kJcvFS).