

from karst regions and tap water from the homes of people living there.

Other research teams are worried that water that has pooled in hurricane debris could provide a breeding ground for disease-carrying mosquitoes. At the height of the Zika epidemic in 2016, experts debated whether a massive hurricane would destroy mosquito habitat or enhance it, says Carmen Zorrilla, an obstetrician and gynaecologist at the University of Puerto Rico in San Juan. The evidence is still unclear, she says, and logistical problems may make it impossible for researchers to gather enough data to provide answers.

In some areas where hospitals faced extensive storm damage, the only medical care available is emergency treatment. Screening for the Zika virus is a low priority, and infected adults rarely experience severe symptoms and are unlikely to seek medical treatment.

There are also few labs on the island that can test samples for Zika and other mosquito-borne diseases. Like many Puerto Rican facilities, the US Centers for Disease Control and Prevention (CDC) dengue lab in San Juan lost power during the hurricane and was closed for a week.

Diesel generators kept its freezers running to preserve blood and other biological samples, but the lab is still running on generator power and is behind on testing some samples. Shipping delays destroyed reagents that the lab had ordered, because the chemicals were not kept consistently cold during transport.

Lab director Stephen Waterman says that the CDC is collecting data on the incidence of mosquito-borne disease and other hurricane impacts. But its priority is to help US government workers and local communities recognize mosquito breeding grounds, and to provide technical help on efforts to control the spread of the insects. Agency staff would also like to verify reports that leptospirosis — a waterborne bacterial disease that is spread by rats — has made dozens of people ill. “We’re focused on preventing disease,” Waterman says.

Yet the ruined facilities and lack of power continue to tax public-health workers’ ability to know where hazards lie. Take the numerous diesel generators running on the island, which produce visible plumes of grey smoke. Benjamin Bolaños, a microbiologist at the University of Puerto Rico in San Juan, worries that these emissions could harm people with respiratory illnesses, but that the effect will be difficult to quantify. “We are blind because probably the [air-quality] monitors were destroyed by the hurricane,” he says.

This makes the prospect of more months without reliable power even more frightening. “The kind of work we’re doing is not because it would be interesting to do,” Cordero says. “It has to be done now, because a few years from now, it’s too late.” ■

## CLIMATE CHANGE

# CO<sub>2</sub> emissions set to spike in 2017

*Increased coal use in China appears to be driving the first rise in global greenhouse-gas output since 2014.*

BY JEFF TOLLEFSON

Humanity’s carbon-dioxide emissions are likely to surge by 2% in 2017, driven mainly by increased coal consumption in China, scientists reported on 13 November<sup>1-3</sup>. The unexpected rise would end a three-year period in which emissions have remained flat despite economic growth.

Researchers with the Global Carbon Project, an international research consortium, presented their findings at the United Nations climate talks in Bonn, Germany. Countries there are ironing out details of how to implement the 2015 Paris climate accord, which calls for limiting global warming to a rise of 1.5–2 °C. If the latest analysis proves correct, global CO<sub>2</sub> emissions will reach a record-breaking 41 billion tonnes in 2017.

“We were not particularly surprised that emissions are up again, but we were surprised at the size of the growth,” says Corinne Le Quéré, a climate scientist at the University of East Anglia in Norwich, UK, and co-author of the work, which was published in three journals. “If 2018 is as big as 2017, then I will be very discouraged,” she says.

Several factors caused the world’s CO<sub>2</sub> emissions to level out from 2014 to 2016, including an economic slowdown in China, the world’s largest emitter; a shift from coal to gas in the United States; and global growth in the use of renewable energies such as solar and wind. Many climate

scientists and policymakers had hoped that the pause represented a shift in energy use that would eventually cause global emissions to peak — and then decline.

The latest analysis projects that carbon emissions in the United States and the European Union will continue to decline — by 0.4% and 0.2%, respectively, in 2017 — although at a slower pace than in recent years. And emissions growth in India is set to slow, rising by just 2% this year, compared with an average of 6% per year over the past decade.

**“If 2018 is as big as 2017, then I will be very discouraged.”**

But the picture is very different in China. This year, the country’s emissions of CO<sub>2</sub> are expected to surge by 3.5%, to 10.5 billion tonnes. The main causes are increased activity at the country’s factories and reduced hydroelectric-energy production, the Global Carbon Project analysis finds.

The effort highlights nagging uncertainties about greenhouse-gas emissions trends, particularly in China, India and other countries with economies that are rapidly growing and changing, says David Victor, a political scientist at the University of California, San Diego. He is not convinced that government actions — at the national or international level — have driven the recent levelling of emissions. And although emissions are projected to grow this year, Victor says that China is still on a trajectory that would see its emissions peak well before 2030.

Taken together, the projections for 2017 reinforce the notion that the world has far to go before it solves the climate problem, says Glen Peters, a climate-policy researcher at the CICERO Center for International Climate Research in Oslo and a co-author of the Global Carbon Project’s 2017 analysis.

“We are not safe yet,” Peters says. “We can’t be complacent.” ■

1. Peters, G. P. *et al.* *Nature Clim. Change* <http://dx.doi.org/10.1038/s41558-017-0013-9> (2017).
2. Jackson, R. B. *et al.* *Environ. Res. Lett.* **12**, 110202 (2017).
3. Le Quéré, C. *et al.* *Earth Syst. Sci. Data Discuss.* <http://dx.doi.org/10.5194/essd-2017-123> (2017).



China is trying to reduce its coal use.