HOLE SPOTTED IN OZONE LAYER'S PROTECTIVE TREATY

Coastal power plants are a major source of bromoform emissions.

The acclaimed agreement to protect the ozone layer might have a blind spot: emissions of a short-lived chemical from power plants, desalination plants and ballast water from ships.

The Montreal Protocol has successfully reduced emissions of chlorofluorocarbons and other long-lasting compounds that endanger Earth's stratospheric ozone layer, which protects the planet from damaging radiation. But the protocol doesn't cover naturally occurring compounds with relatively short lifespans.

Yue Jia, then at the University of Saskatchewan in Saskatoon, Canada, and colleagues compiled a global inventory of one such compound, bromoform. The chemical is emitted by seaweed and other marine organisms, as well as through industrial water use.

The analysis suggests that global bromoform emissions could be nearly one-third higher than previously estimated, driven mainly by power plants in coastal, industrialized areas in Europe, North America and Asia. These emissions significantly increase the movement of ozone-destroying bromine into the lower stratosphere, particularly in the Northern Hemisphere.

Geophys. Res. Lett. **50**, e2023GL102894 (2023)

EXTENDED LA NIÑA LINKED TO SEVERE FIRES IN AUSTRALIA

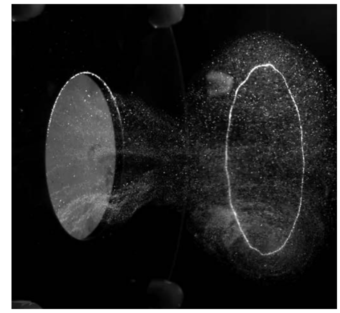
Extreme Australian wildfires in 2019–20 helped to nudge the planet towards three consecutive years of La Niña weather conditions.

Both wildfires and volcanic eruptions produce tiny particles that can enter the atmosphere and reflect sunlight back to space, cooling the landscape below. Scientists know that because of this effect, big volcanic eruptions in the Southern Hemisphere can help to create La Niña conditions, which affect temperature and rainfall in various parts of the world.

John Fasullo at the National Center for Atmospheric Research in Boulder, Colorado, and his colleagues wanted to explore the impacts of Australia's devastating 'Black Summer' bushfires, which released particles that circled the globe. The scientists used computer models to simulate atmospheric changes after the fires began in 2019, both in a scenario that incorporated the wildfire particles and in one that did not.

The scenario that included the particles led to cooler temperatures in parts of the southeastern Pacific Ocean — conditions that set up La Niña. The fires probably contributed to all three years of the rare 'triple dip' La Niña that lasted from 2020 to 2022.

Sci. Adv. **9**, eadg1213 (2023)



RING THE CHANGES: FLUID LOOPS CREATE TAME TURBULENCE

An isolated blob of turbulence offers a playground for fundamental studies of this complex phenomenon.

Turbulence refers to seemingly random changes in pressure and velocity that can occur in a fluid, such as water or air. The effect is seen in natural phenomena ranging from fast-flowing rivers to billowing storm clouds. In experiments, turbulence is typically generated using fluid flows that emerge at the edges of structures such as pipes or spinning discs. But these boundaries make it difficult to understand how exactly the turbulence has formed and how it would evolve if it were unconstrained.

Takumi Matsuzawa and his colleagues at the University of Chicago in Illinois found a method to produce and sustain turbulence far from boundaries. They created loop-shaped fluid structures called vortex rings (pictured, above right) in a water tank by drawing water through openings in the tank's walls (above left). The rings then travel to the tank's centre and combine like Lego blocks to form a self-confining blob of turbulence.

The team says that this approach provides a way to not only position and localize turbulence but also manipulate and harness it.

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