



NEWS BULLETIN

Plants and Pollution ENVIS RP-NBRI

Vol. 10, October 2021

Climate Disaster

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

The climate disaster is here

[The Guardian, 14 October 2021](#)

The enormous, unprecedented pain and turmoil caused by the climate crisis is often discussed alongside what can seem like surprisingly small temperature increases – 1.5C or 2C hotter than it was in the era just before the car replaced the horse and cart.

These temperature thresholds will again be the focus of upcoming UN climate talks at the COP26 summit in Scotland as countries variously dawdle or scramble to avert climate catastrophe. But the single digit numbers obscure huge ramifications at stake. “We have built a civilization based on a world that doesn’t exist anymore,” as Katharine Hayhoe, a climate scientist at Texas Tech University and chief scientist at the Nature Conservancy, puts it.

The world has already heated up by around 1.2C, on average, since the preindustrial era, pushing humanity beyond almost all historical boundaries. Cranking up the temperature of the entire globe this much within little more than a century is, in fact, extraordinary, with the oceans alone absorbing the heat equivalent of five Hiroshima atomic bombs dropping into the water every second.

Until now, human civilization has operated within a narrow, stable band of temperature. Through the burning of fossil fuels, we have now unmoored ourselves from our past, as if we have transplanted ourselves onto another planet. The last time it was hotter than now was at least 125,000 years ago, while the atmosphere has more heat-trapping carbon dioxide in it than any time in the past two million years, perhaps more.

Since 1970, the Earth’s temperature has raced upwards faster than in any comparable period.....

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Agricultural runoff contributes to global warming - New study helps us figure out how and what we can do about it

[Science Daily, 19 October 2021](#)

Nitrous oxide (N₂O) is a potent greenhouse gas, with 300 times the warming ability of carbon dioxide. Due to fertilizer runoff from farm fields, an increasing load of nitrogen is washing into rivers and streams, where nitrogen-breathing microbes break some of the fertilizer down into N₂O, which the river releases into the atmosphere as it tumbles toward the ocean. But, until now, scientists haven't had a clear picture of how the process works, what fraction of the runoff winds up as N₂O or what steps might be taken to mitigate N₂O emissions.

"Humans are fundamentally altering the nitrogen cycle," says Matthew Winnick, sole author of the new paper, published recently in *AGU Advances*, and professor of geosciences at the University of Massachusetts Amherst. "We've changed how nitrogen moves through the environment." Much of this change can be attributed to enormous amounts of nitrogen-rich chemical fertilizers, spread upon agricultural fields, which run off into streams and rivers when it rains, and get converted to nitrate.

Scientists have long known that microbes in the soil and streambed contribute to the "denitrification process," whereby nitrate is converted to either harmless dinitrogen gas or N₂O. But the exact mechanics of the conversion processes have remained a mystery, as evidenced by the wide range of N₂O,.....

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Heat waves likely to last ‘25 times longer’ in India by another 2-4 decades, says climate report

Down to Earth, 28 October 2021

The heat waves in India are likely to “last 25 times longer by 2036-2065” if carbon emissions remain high and push global temperature rise to 4 degrees Celsius by the end of the century, according to an international climate report published October 28, 2021 covering G20 countries.

The report was launched ahead of the G20 summit to be held in Rome on October 30 and 31. It is likely to push a global emission cut agenda during the discussion, scheduled to be attended by several global leaders, including Indian Prime Minister Narendra Modi.

The G20 is an inter-governmental forum comprising 19 countries and the European Union (EU). It works to address major economic issues, including those related to international financial stability, climate change mitigation and sustainable development.

No country is immune to climate change

Climate change will have devastating impacts on every G20 member, the report said. It was conducted by a team of over 40 scientists at Euro-Mediterranean Center on Climate Change, a research centre that serves as the Italian focal point for the Intergovernmental Panel on Climate Change (IPCC).

“Climate impacts are already hitting the G20. Over the last 20 years, heat-related deaths have increased by at least 15 per cent in all G20 countries, while forest fires have burnt an area one-and-a-half times the size of Canada,” the report warned. The report also pointed out that,.....

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Warming climate will increase number of harmful algae blooms

Science Daily, 28 October 2021

When algae go wild, bad things can happen, especially when those algae produce toxic substances. The ripple effects can be potent and long-lasting.

Examples include the so-called "dead zone" that arises periodically in the Chesapeake Bay, when decaying algal blooms suck the oxygen out of an area and threaten all plant and animal life there. Toxins produced by a 2014 algal bloom in Lake Erie polluted the water supply of Toledo, Ohio, forcing a closure of a water plant there. These harmful blooms can be deadly to water-loving dogs, cause illness in humans and wreak havoc on a region's economy.

Scientists have shown how warming temperatures contribute to an increasing number of these harmful algal blooms.

A new study shows how changes in light conditions have a significant influence on the growth and impact of these algae. The study, led by University of Delaware Associate Professor Kathryn Coyne of the College of Earth Ocean and the Environment, was published Wednesday, Oct. 27 in *PLOS ONE*.

The bottom line: a warming climate looks good for the growth of toxic algae and may disrupt other organisms that are part of the food web -- whether they graze on this algae or are consumed by it. "Especially for blooms that occur near shore,.....

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