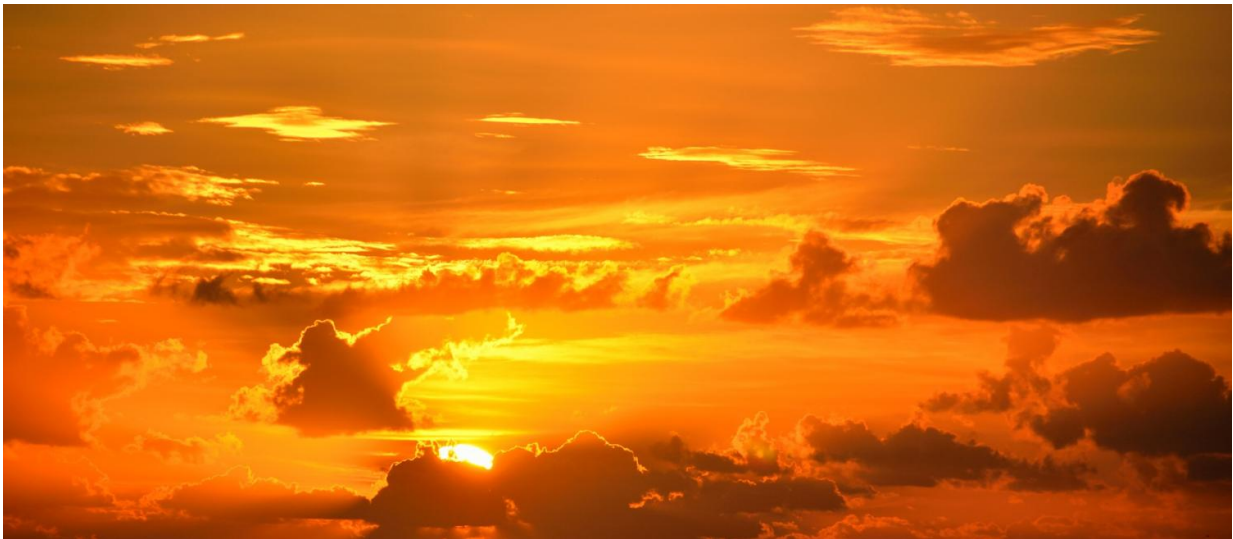


15,000 scientists in 184 countries warn about negative global environmental trends

November 13 2017



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Human well-being will be severely jeopardized by negative trends in some types of environmental harm, such as a changing climate, deforestation, loss of access to fresh water, species extinctions and human population growth, scientists warn in today's issue of *BioScience*, an international journal.

The viewpoint article—"World Scientists' Warning to Humanity: A Second Notice"—was signed by more than 15,000 scientists in 184 countries.

The warning came with steps that can be taken to reverse negative trends, but the authors suggested that it may take a groundswell of public pressure to convince political leaders to take the right corrective actions. Such activities could include establishing more terrestrial and marine reserves, strengthening enforcement of anti-poaching laws and restraints on wildlife trade, expanding family planning and educational programs for women, promoting a dietary shift toward plant-based foods and massively adopting renewable energy and other "green" technologies.

Global trends have worsened since 1992, the authors wrote, when more than 1,700 scientists—including a majority of the living Nobel laureates at the time—signed a "World Scientists' Warning to Humanity" published by the Union of Concerned Scientists. In the last 25 years, trends in nine environmental issues suggest that humanity is continuing to risk its future. However, the article also reports that progress has been made in addressing some trends during this time.

The article was written by an international team led by William Ripple, distinguished professor in the College of Forestry at Oregon State University. The authors used data maintained by government agencies, nonprofit organizations and individual researchers to warn of "substantial and irreversible harm" to the Earth.

"Some people might be tempted to dismiss this evidence and think we are just being alarmist," said Ripple. "Scientists are in the business of analyzing data and looking at the long-term consequences. Those who signed this second warning aren't just raising a false alarm. They are acknowledging the obvious signs that we are heading down an unsustainable path. We are hoping that our paper will ignite a widespread public debate about the global environment and climate."

Progress in some areas—such as a reduction in ozone-depleting chemicals and an increase in energy generated from renewable

sources—shows that positive changes can be made, the authors wrote. There has been a rapid decline in fertility rates in some regions, which can be attributed to investments in education for women, they added. The rate of deforestation in some regions has also slowed.

Among the negative 25-year global trends noted in the article are:

- A 26 percent reduction in the amount of [fresh water](#) available per capita
- A drop in the harvest of wild-caught fish, despite an increase in fishing effort
- A 75 percent increase in the number of ocean dead zones
- A loss of nearly 300 million acres of forestland, much of it converted for agricultural uses
- Continuing significant increases in [global carbon emissions](#) and average temperatures
- A 35 percent rise in human population
- A collective 29 percent reduction in the numbers of mammals, reptiles, amphibians, birds and fish

Ripple and his colleagues have formed a new independent organization, the Alliance of World Scientists, to be a collective voice on environmental sustainability and human well-being. Scientists who did not sign the warning prior to publication can endorse the published [warning](#) by visiting <http://scientists.forestry.oregonstate.edu/>.

More information: *BioScience* (2017). [DOI: 10.1093/biosci/bix125](https://doi.org/10.1093/biosci/bix125)

Provided by Oregon State University

Citation: 15,000 scientists in 184 countries warn about negative global environmental trends

(2017, November 13) retrieved 20 April 2024 from <https://phys.org/news/2017-11-scientists-countries-negative-global-environmental.html>

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