OXFORD ACADEMY
Journals
Books
High Impact Articles in BIOLOGY
ENROLL BIOLOGY
BioScience
AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES



Article Contents
Climate-related extreme weather
Recent trends in planetary vital signs
Climate policy
Climate action
Project selection
Supplemental material
Acknowledgments
References cited
Supplementary data

ORIGINAL ARTICLES

# World Scientists' Warning of a Climate Emergency 2019

William J. Ripple, Christopher Wolf, Thomas M. Newsome, Mauro Galetti, Mohsen Alamgir, Eileen Crist, Mahmoud I. Mahmoud, William F. Laurance, 15,000 scientist signatories, Thomas M Newsome, Matthew E Baillie, Salomona Hua, Beverly E Law, Luke Kemp, ... Show more

BioScience, Sept2020, https://doi.org/10.1093/biosci/biz088
Published: 29 October 2019

PDF Split View Cite Permissions Share

Issue Section: Special Report

We are now at "code red" on planet Earth. Humanity is unexpectedly facing a climate emergency. The scale of untold human suffering, already immense, is rapidly growing with the escalating number of climate-related disasters (figure 1). Although the Paris Agreement (United Nations 2015) is a hopeful step, Special Report and Global Warming of 1.5°C authors warn of the severe effects of climate change.

2019 marks the 16th anniversary of the "World Scientists' Warning to Humanity," signed by more than 1700 scientists to warn that "the ultimate survival of human civilization and the biosphere is now in grave danger" (Ripple et al. 2019). Despite numerous written warnings from the Intergovernmental Panel on Climate Change and countless scientists' warnings of increasing severity, greenhouse gas (GHG) emissions from 195 countries (Ripple et al. 2020) Current policies are on track to produce around 3 degrees Celsius (°C) of global warming by the end of this century (Rogelj et al. 2016, Climate Action Tracker 2019, Raftery 2019). The consequences of global heating are becoming increasingly extreme, and extremes and so global societal collapse are plausible and dangerously underplayed (Kemp et al. 2022). Motivated by the moral urgency of future generations, here, we focus on vital climate-related diseases, assess planetary vital signs, and provide sweeping policy recommendations.

## Figure 1.

Untold Human Suffering in Pictures

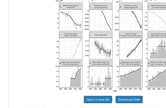
Open in new tab Download slide

The impacts of climate-related droughts (left column) and floods (right column). Left column (top to bottom): "Children in dust storm" (Ethiopia, 2016, Oxfam International CC BY2.0); A water hole that may have been created because of drought (Mozambique, 2016, photographer: Aurelia Marine of Greenwhich/IFRC), drought-affected corn field in Paoshing County, Hebei Province, China (2014, photographer: Mengzhe Wang/Greenpeace); "Dry land" (Kenya, 2016, Oxfam International CC BY2.0); "Drought" (Kenya, 2017, Oxfam International CC BY2.0). Right column (top to bottom): Houses are nearly submerged by flooding (Bangladesh, 2016, photographer: Worldvision based/Climate Visuals Coordinator); "A girl, stuck in floodwater, is rescued" (Bangladesh, 2017, photographer: Zoe Rahman/Oxfam International CC BY2.0); "Flooded road" (Bangladesh, 2016, Oxfam International CC BY2.0); "Flooded road" (Bangladesh, 2016, photographer: Worldvision based/Climate Visuals Coordinator); "Flooded streets in escape from waters" (United States, 2017, Oxfam International CC BY2.0); photo credits are licensed under Creative Commons and all quotes are from the Climate Visuals project (https://climatevisuals.org). See supplemental file S1 for details and more pictures.

## Recent trends in planetary vital signs

Updating our planetary vital signs first published by Ripple and colleagues (2019) provides a simple but powerful method to show the urgent need for societal change (figure 2). Although the Paris Agreement (United Nations 2015) aims to limit global warming to well below 2°C, preferably to 1.5°C, the 2°C target is clearly not enough to avoid tipping points and runaway climate change (Lenton et al. 2019). We discuss some of these vital signs below.

## Figure 2.


Human population
Fossil fuel subsidies
Forest loss
Terrestrial vertebrate population
Fossil fuel subsidies
Fossil fuel subsidies
Fossil fuel subsidies

Google Scholar WorldCat

Ripple WJ, et al . 2021. World scientists' warning of a climate emergency 2021. *BioScience* 71: 894–898,
Google Scholar Crossref WorldCat

Rockström J, et al. 2009. Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* 14: 32.
Google Scholar WorldCat

Rousi E, Kornhuber K, Beobide-Arsuaga G, Luo F, Coumou D. 2022. Accelerated western European heatwave trends linked to more-persistent double jets over Eurasia. *Nature Communications* 13: 3851.
Google Scholar Crossref PubMed WorldCat

Stendel M, Francis J, White R, Williams PD, Woollings T. 2021. The jet stream and climate change. Pages 327–357 in Letcher TM, ed. *Climate Change: Observed Impacts on Planet Earth, 3rd ed*. Elsevier.
Google Scholar Crossref Google Preview WorldCat COPAC

Wackernagel M, et al. 2002. Tracking the ecological overshoot of the human economy. *Proceedings of the National Academy of Sciences* 99: 9266–9271.
Google Scholar Crossref WorldCat

Zhao Q, et al. 2021. Global, regional, and national burden of mortality associated with non-optimal ambient temperatures from 2000 to 2019: A three-stage modelling study. *Lancet Planetary Health* 5: e415–e425.
Google Scholar Crossref PubMed WorldCat

© The Author(s) 2022. Published by Oxford University Press on behalf of the American Institute of Biological Sciences

This article is published and distributed under the terms of the Oxford University Press, Standard Journals Publication Model ( https://academic.oup.com/journals/pages/open_access/funder_policies/chorus/standard_publication_model)

© The Author(s) 2022. Published by Oxford University Press on behalf of the American Institute of Biological Sciences

## Supplementary data

biac083_Supplemental_file_S1 - pdf file
biac083_Supplemental_file_S2 - pdf file

VIEWS ALTMETRIC
0 535
More metrics information

**Email alerts**

Article activity alert
Advance article alerts
New issue alert

Receive exclusive offers and updates from Oxford Academic

**Recommended**

World Scientists' Warning of a Climate Emergency 2021
William J Ripple et al., AIBS Bulletin (now BioScience), 2021

Primary Forests Are Undervalued in the Climate Emergency
Dominick A Dellasala et al., AIBS Bulletin (now BioScience), 2020

The Climate Emergency, Forests, and Transformative Change
William J Ripple et al., AIBS Bulletin (now BioScience), 2020

Scientists warn in report that climate change has pushed Earth to 'code red'
by American Institute of Biological Sciences, Phys.org, 2022

Enteric methane mitigation interventions
Julia Q Fouts et al., Translational Behavioral Medicine

Mitigation of Greenhouse Gases Emissions by Management of Terrestrial Ecosystem
Artur Pawłowski et al., Ecological Chemistry and Engineering S, 2017

Powered by TREND MD

**Related articles in**

Google Scholar

**Citing articles via**

Google Scholar

Crossref

**Latest | Most Read | Most Cited**

World Scientists' Warning of a Climate Emergency 2022

In Living Color: Pigment-Based Microbial Ecology At the Mineral–Air Interface

Safeguarding Imperiled Biodiversity and Evolutionary Processes in the Wallacea Center of Endemism

Common Misconceptions about Text Recycling in Scientific Writing

Greater Consideration of Animals Will Enhance Coastal Restoration Outcomes

**More from Oxford Academic**

Environment | Science and Mathematics | Social Sciences | Books | Journals

Publishing guidance for early career researchers.
OXFORD UNIVERSITY PRESS



Online ISSN 1525-3244 Print ISSN 0006-3568 Copyright © 2022 American Institute of Biological Sciences



Copyright © 2022 Oxford University Press 