

Natural climate change solutions highly effective in the long term

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Nature-based solutions (NbS) can contribute to the fight against climate change up to the end of our century, according to new Oxford research in the leading scientific journal *Nature*. The analysis suggests that, to limit global temperature rise, we must slash emissions and increase NbS investment to protect, manage and restore ecosystems and land for the

future.

The Oxford team found NbS measures, including the protection and large-scale restoration of eco-systems and improved land management, could cut peak global [warming](#) by between 0.1°C for a 1.5°C peak warming target, to 0.3°C for a 2.0°C peak warming target.

This would be achieved by removing as much as 10 gigatons of CO₂ per year from 2025 onwards—more than the global transportation sector's annual emissions, at a cost of less than US\$100 per ton of CO₂.

Crucially, NbS could continue to cool the planet long after a peak temperature is reached. In the researchers' best-case scenario, NbS can reduce global warming by a significant 0.1°C by 2055, and 0.4°C by 2100. But, it is estimated, only a tiny fraction of existing climate-mitigation financing is currently given to nature-based solutions.

According to the lead author Cécile A. J. Girardin, technical director of Oxford's Nature Based Solutions Initiative, "The world must invest now in nature-based solutions that are ecologically sound, socially equitable, and designed to deliver multiple benefits to society over a century or more. Properly managed, the protection, restoration and sustainable management of our working lands could benefit many generations to come."

Nature-based solutions work with nature to address societal challenges while providing benefits for both human well-being and biodiversity—and they have been made a key focus of November's COP26 climate change conference in November.

Co-author Professor Yadvinder Malhi, Oxford Professor of Ecosystem Science, comments, "The more ambitious the climate target, the shorter the timeframe for such solutions to have an effect on peak warming."

Professor Myles Allen, adds, "Hence corporate claims of ambitious climate goals, but medium-term plans that rely on NbS as an alternative to reducing fossil fuel emissions, just don't stack up."

But, the report warns, if global warming is not held in check, wildfires and other ecological damage could lessen the effectiveness of nature-based solutions. Therefore, close attention must be paid to their long-term carbon sink potential and their impacts on biodiversity, equity and the United Nations' Sustainable Development Goals. It also means global warming must continue to be limited through other ways, from decarbonisation to geological storage of CO₂.

The authors call for increased investment combined with rigorous evaluation of activities undertaken, using metrics which consider the complex, long-term benefits that NbS provide.

"An ambitious scaling-up of nature-based solutions needs to be implemented fast but also carefully, in a way that supports biodiversity and local people's rights, while keeping fossil fuels in the ground," concludes co-author, Professor Nathalie Seddon, Founding Director of Oxford's Nature-based Solutions Initiative.

"Nature-based solutions can help cool the planet—if we act now" has been published in *Nature*.

More information: Cécile A. J. Girardin et al. Nature-based solutions can help cool the planet—if we act now, *Nature* (2021). [DOI: 10.1038/d41586-021-01241-2](https://doi.org/10.1038/d41586-021-01241-2)

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