Global Science Research Journals

Available online at
www.globalscienceresearchjournals.org/

Commentary | Open Access

Journal of Biodiversity and Conservation Research

ISSN: Vol. 10 (3), pp. 1-2, December, 2022

The impact of daily temperature variability on the environment

M Newbold*

Department of Zoology, University of British Columbia, Vancouver, Canada

***Corresponding author. E-mail: michealnewbold@zoo.ca**

Received: 02-Dec-2022, Manuscript no: JBCR-22-83237, **Editorial assigned:** 07-Dec-2022, PreQC no: JBCR-22-83237 (PQ), **Reviewed:** 26-Dec-2022, QC no: JBCR-22-83237, **Revised:** 03-Jan-2023, Manuscript no: JBCR-22-83237 (R), **Published:** 11-Jan-2023, DOI: 10.15651/JBCR.22.1.016.

DESCRIPTION

Due to anthropogenic and natural disturbances, forests have experienced significant gains and losses in recent decades. Deforestation has significant effects on local and regional climate through bio geophysical processes in addition to its effect on the carbon cycle. Deforestation affects climate in two ways: on the one hand, it increases surface albedo and cools the environment; on the other, it reduces evapotranspiration and warms the environment because of lower aerodynamic roughness, rooting depth, leaf area, and canopy conductance for transpiration. The tropics are dominated by the evapotranspiration-driven warming effect, while the boreal areas are dominated by the albedo-driven cooling impact. Over the majority of the world, deforestation also has a warming effect during the day and a cooling effect at night. The temperature response to deforestation is asymmetrical during the day, which widens the diurnal temperature range.

Due to persistent evapotranspiration and more effective heat dissipation, forests can typically maintain a lower ambient temperature on hot days; hence, deforestation tends to exacerbate hot extremes. This effect is questionable, though, as other studies also note a reduction in hot-temperature extremes after deforestation. Although the impacts of deforestation on the average, the daily cycle, and temperature extremes have been extensively studied, it is still not well understood how deforestation affects temperature variability. Temperature variability refers to variations in a temperature time series over a range of time scales (from daily to decadal).

Particularly, there is a direct connection between natural and human systems and the high-frequency daily temperature variations. For instance, increased daily temperature variability raises the dangers of chronic disease or epidemic related mortality. Variations in daily temperature also affect other aspects of ecosystems, including crop productivity and coral bleaching. Increased daily temperature variation may possibly be a danger to macroeconomic expansion. Statistically speaking, an increase in variability often coincides with higher tail likelihood, meaning more frequent weather and climatic catastrophic occurrences and subsequently extensive unfavorable repercussions on environment and people. Understanding the impact of deforestation on temperature variability is therefore just as crucial as understanding the impact on temperature mean and extremes.

In the northern mid and high latitude continents, the historical daily temperature variability is seen to decline mainly in the boreal winter, spring, and fall but to increase in a few areas in the boreal summer. Previously, anthropogenic Green House Gas (GHG) emissions, aerosols, urbanization, and internal climate variability were all blamed for changes in daily temperature variability, but forest changes were rarely mentioned. Examining the impact of deforestation on daily temperature variability will help us better understand how humans have contributed to the evolution of daily temperature fluctuation given the widespread deforestation that has occurred throughout history. Additionally, afforestation has been widely advocated as a natural way to reduce global warming.

This hypothesis is mostly supported by the cooling effects of afforestation due to carbon sequestration and some bio-geophysical processes (such as the evaporative cooling effect), but the impact of afforestation on temperature fluctuation has never been taken into account and assessed. Determining how afforestation affects daily temperature variability might therefore assist prevent unintended climatic effects that may arise after the implementation of large-scale afforestation. In this study, they use a variety of earth system models and measurements to examine the bio-geophysical impact of idealised deforestation on daily temperature variations at the world scale. On the basis of the thermodynamic energy equation, they also investigate probable explanations

for the deforestation effect. The findings demonstrate that widespread deforestation, especially during the winter, might exacerbate regional daily temperature fluctuation in the northern extra tropics.

As a result, deforested areas are subjected to more frequent extreme warming and cooling events. The increased temperature variability is primarily due to increase near-surface horizontal Temperature Advection (TADV), which is partially offset by the decreased variability in surface sensible heat flux. Furthermore, they find higher daily temperature variability in North America as as a result of large-scale deforestation since 1850. At regional scales, the deforestation effect even cancels out the total effect of other anthropogenic forcing. Large-scale afforestation in North America, on the other hand, is expected to reduce daily temperature variability by the end of the twenty-first century. This study reveals an overlooked human influence on daily temperature variability deforestation or afforestation, which has implications for policy decisions regarding large-scale afforestation implementation.