

# How species distribution mediates the global relationship between forest productivity and richness

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Biodiversity is an essential factor for ecosystem health and productivity. The number of species in an ecosystem has previously been found to

positively correlate with forest productivity (the volume of tree and plant species able to grow in the forest.)

However, a new paper published in *Journal of Ecology* provides evidence at a global scale that the number of species present in a forest (species richness), is not sufficient enough to measure the effect of [biodiversity](#) on [forest productivity](#). Biodiversity is a product of species richness, but also the relative abundance of species in the plot of land. This is known as evenness.

Evenness refers specifically to the distribution of species abundance. Here's an example: A plot of land has 50 trees. If the plot has 5 groups of 10 trees, with each group being a different type of species, this would be considered even. However, if the plot has 46 trees that are all one species and only 4 trees representing the other species types, this would be an uneven distribution.

The new study uses data from over 1 million forest plots worldwide. From this data, scientists discovered a [negative relationship](#) between the richness and the evenness of forests.

Forests with a wider variety of species tended to be highly uneven, with just a few species dominating the land. In these cases, evenness will be more important for promoting forest productivity, as opposed to increasing the [species richness](#).

Dr. Iris Hordijk, lead author, explains, "The study suggests that every species of tree in a species rich forest needs to be present in high numbers in order to contribute to the productivity of the forest."

Overall, this study demonstrates the importance of species evenness in influencing forest productivity. At a time when diverse and productive forests are needed to fight [climate change](#) and biodiversity loss,

understanding the role of species abundances is critical for guiding ecosystem conservation and management efforts.

Prof. Thomas Crowther, senior author of the paper, explains, "Increasing a [forest](#)'s diversity doesn't only mean increasing the number of species. It can also mean working to promote the natural evenness of those species."

**More information:** Iris Hordijk et al, Evenness mediates the global relationship between forest productivity and richness, *Journal of Ecology* (2023). [DOI: 10.1111/1365-2745.14098](https://doi.org/10.1111/1365-2745.14098)

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