

There are more than three trillion trees on Earth - but it's not all good news

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The good news: New estimates suggest there are more than three trillion trees on Earth, seven-and-a-half times more than some previous estimates.

The bad news: The total number of trees on Earth has plummeted by roughly 46% since the start of human civilisation.



Kielder Water and Forest Park in Northumberland (Owen Humphreys/PA)

An international team of researchers, led by Yale, used satellite imagery, forest inventories and supercomputer technologies to provide the most comprehensive assessment of tree populations ever produced. Tree populations were mapped worldwide and the new insights can improve many climate change models, say the researchers.

“Trees are among the most prominent and critical organisms on Earth, yet we are only recently beginning to comprehend their global extent and distribution,” said Thomas Crowther, a postdoctoral fellow at the Yale School of Forestry & Environmental Studies (F&ES) and lead author of the study.

“They store huge amounts of carbon, are essential for the cycling of nutrients, for water and air quality, and for countless human services,” he added. “Yet you ask people to estimate, within an order of magnitude, how many trees there are and they don’t know where to begin. I don’t know what I would have guessed, but I was certainly surprised to find that we were talking about trillions.”

Boreal forest near Alberta, Canada (Larry MacDougal/AP)

The sub-arctic regions of Russia, Scandinavia, and North America have the highest density of trees, but the



largest forest areas are in the tropics – which are home to about 43% of the world’s trees.

Crowther and his colleagues collected tree density information from more than 400,000 forest plots worldwide, which included several national forest inventories and peer-reviewed studies, all of which included tree counts that had been verified at the ground level. They then used satellite imagery to see how tree population was related to local characteristics like climate, topography, vegetation, soil condition, and human impacts.

One of the things they found was that in wetter regions, more trees tended to grow. This isn’t as positive as it sounds though, as humans tend to prefer these moist areas to produce agriculture.

A tree near the banks of the Panama Canal (Kike Calvo/AP)

Unsurprisingly, the study confirmed that humans have the biggest impact on tree numbers worldwide, according to Crowther. In short, tree densities usually plummet as human population grows. Deforestation, land-use change, and forest management are responsible for a gross loss of more than 15 billion trees each year.

“We’ve nearly halved the number of trees on the planet, and we’ve seen the impacts on climate and human health as a result,” Crowther said. “This study highlights how much more effort is needed if we are to restore healthy forests worldwide.”

The research is published in the journal Nature.

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