

<http://whrc.org/forest-carbon/>

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A revolutionary new approach to measuring changes in forest carbon density has helped WHRC scientists determine that the tropics now emit more carbon than they capture, countering their role as a net carbon “sink.”

The shift from carbon sink to carbon “source” was caused by widespread deforestation, degradation and disturbance, according to a new study by a team of WHRC and Boston University scientists. The landmark paper was published online in the journal *Science* on September 28.

The findings add new urgency to the critical need for aggressive national and global-scale efforts to reduce greenhouse gas emissions. Importantly, the study suggests there is a critical window of opportunity to reverse the trend in emissions by halting deforestation and degradation, and actively restoring forests where they have been lost.

“These findings provide the world with a wakeup call on forests,” said WHRC scientist Alessandro Baccini, the report’s lead author. “If we’re to keep global temperatures from rising to dangerous levels, we need to drastically reduce emissions and greatly increase forests’ ability to absorb and store carbon. Forests are the only carbon capture and storage ‘technology’ we have in our grasp that is safe, proven, inexpensive, immediately available at scale, and capable of providing beneficial ripple effects—from regulating rainfall patterns to providing livelihoods to indigenous communities.”

Using 12 years (2003-2014) of satellite [Read the full paper](#) in *Science* [Download a two-page explanation](#) of the paper and field measurements, Baccini and his [Visit thecarbonsource.org](#) for interactive team were able to capture losses in forest maps carbon from wholesale deforestation as well [Watch a 2016 video](#) from the California Academy of Sciences that explains this work [View an infographic](#) on forest emissions as from more difficult-to-measure fine-scale

degradation and disturbance, which has previously proven a challenge to the scientific community over large areas.

“It can be a challenge to map the forests that have been completely lost,” said WHRC scientist Wayne Walker, one of the report’s authors. “However, it’s even more difficult to measure small and more subtle losses of forest. In many cases throughout the tropics you have selective logging, or smallholder farmers removing individual trees for fuel wood. These losses can be relatively small in any one place, but added up across large areas they become considerable.”

Using this new capability, the researchers discovered that tropics represent a net source of carbon to the atmosphere — about 425 teragrams of carbon annually – which is more than the annual emissions from all cars and trucks in the United States.