

Vanishing mangroves are carbon sequestration powerhouses

Jeremy Hance
mongabay.com
April 05, 2011

Mangroves may be the world's most carbon rich forests, according to a new study in *Nature Geoscience*. Measuring the carbon stored in 25 mangrove forests in the Indo-Pacific region, researchers found that mangroves forests stored up to four times as much carbon as other tropical forests, including rainforests.

"Mangroves have long been known as extremely productive ecosystems that cycle carbon quickly, but until now there had been no estimate of how much carbon resides in these systems. That's essential information because when land-use change occurs, much of that standing carbon stock can be released to the atmosphere," explains co-author Daniel Donato, a postdoctoral research ecologist at the Pacific Southwest Research Station in Hilo, Hawaii.

But how do mangroves, which are tropical coastal forests that are adapted to saline-conditions, store so much more carbon? The secret, say the researchers, is in the soil. Mangroves grow in deep soils that are on average five times larger than other forests soils in the tropics, as well as in temperate and boreal regions. Tidal water buries organic and inorganic material in this soil, which due to low-oxygen conditions, stores carbon more efficiently than other forest soils.

"When we did the math, we were surprised to see just how much carbon is likely being released from mangrove clearing," says Donato.

The findings make mangroves key to the global fight against climate change and, according to the study, should push policymakers to consider mangrove conservation in climate change agreements.



Beyond carbon

Mangroves provide a number of other ecosystems benefits

beyond carbon sequestration. The coastal forests serve as nurseries for a variety marine fish, underpinning global fisheries and providing additional food for coastal communities.

In addition, recent studies have found that mangroves buffer human populations and property against tropical storms. During the devastating 2004 tsunami in Southeast Asia, regions with mangroves suffered less damage than those without.

Prior to today's study regarding carbon sequestration, it estimated that mangroves provide at least \$1.6 billion in ecosystem services annually. Yet despite their importance, mangroves are being felled at stunning rates.

An imperiled forest

According to a recent satellite analysis, 35% of the world's mangroves were destroyed in 20 years, from 1980 to 2000. Around 50% of the world's mangroves have likely vanished in the last half-century. Mangroves are being lost to a variety of impacts, including coastal developments; agriculture and aquaculture, such as shrimp farms and rice fields; and rising sea levels due to climate change.

"Mangroves are being destroyed at an alarming rate. This needs to stop. Our research shows that mangroves play a key role in climate change mitigation strategies," said Daniel Murdiyarso, Senior Scientist at The Center for International Forestry Research (CIFOR), a co-author of the paper on mangroves and carbon sequestration.

According to the study mangroves account for 10% of the world's carbon emissions due to deforestation, even though they make up less than 1% of the world's forests.

"There is a lack of awareness of the full implications of mangrove loss for humankind," Murdiyarso adds. "There is an urgent need for governments to acknowledge their importance and develop better policies to ensure their protection."

Currently, less than 7% of the world's mangroves are under legal protection.

CITATION: Donato, D. C. et al. Nature Geoscience advance online publication doi:10.1038/ngeo1123 (2011).



Mangroves replaced by rice fields in Sulawesi, Indonesia. Photo by: Rhett A. Butler.



Global extent of mangrove ecosystems. Image courtesy of NASA and the US Geological Society. [Click to enlarge.](#)



Extent of mangroves in Southeast Asia. Image courtesy of NASA and the US Geological Society. Click to enlarge.


Comments (0)



Add a comment...

 Facebook social plugin



Like  Sign Up to see what your friends like.

http://print.news.mongabay.com/2011/0405-hance_mangroves.html

Ethical Investments

Read Merrill Lynch's Tips For Values Based Investing Now.



wealthmanagement.ml.com/



Mongabay.com seeks to raise interest in and appreciation of wild lands and wildlife, while examining the impact of emerging trends in climate, technology, economics, and finance on conservation and development.

Copyright mongabay 2009