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Planting New Forests Can't Match Saving Old Ones in Cutting Greenhouse Gases, Study Finds

By ANDREW C. REVKIN

A new study has cast doubts on an important element of a proposed treaty to fight global warming: the planting of new forests in an effort to sop up carbon dioxide, a heat-trapping gas.

The research concludes that old, wild forests are far better than plantations of young trees at ridding the air of carbon dioxide, which is released when coal, oil and other fossil fuels are burned.

The United States and other countries with large land masses want to use forest plantations to meet the goals of the proposed treaty. The study's authors say that any treaty also needs to protect old forests and that, so far there is no sign that such protections are being considered.

Without such protections, the scientists conclude, some countries could be tempted to cut down old forests now and then plant new trees on the deforested land later, getting credit for reducing carbon dioxide when they have actually made matters worse.

The analysis, published in the journal Science today, was done by Dr. Ernst-Detlef Schulze, the director of the Max Planck Institute for Biogeochemistry in Jena, Germany, and two other scientists at the institute.

Several climate and forestry experts familiar with the work said the study provided an important new argument for protecting old-growth woods. And they say the study provides a reminder that the main goal should be to reduce carbon dioxide emissions at the source, smokestacks and tailpipes.

In old forests, huge amounts of carbon taken from the air are locked away not only in the tree trunks and branches, but also deep in the soil, where the carbon can stay for many centuries, said Kevin R. Gurney, a research scientist at Colorado State University. When such a forest is cut, he said, almost all of that stored carbon is eventually returned to the air in the form of carbon dioxide.

''It took a huge amount of time to get that carbon sequestered in those soils,'' he said, ''so if you release it, even if you plant again, it'll take equally long to get it back.''

Negotiators are to meet in November to settle on methods for staving off a predicted warming that could disrupt ecosystems, harm agriculture and cause sea levels to rise, eroding coasts.

The negotiations are taking place under the Kyoto Protocol, an agreement that was signed by more than 100 countries in 1997 but has not yet been ratified. It sets goals for cutting greenhouse gas emissions starting in 2008 but includes few details on how to achieve them.

The United States, Canada, Russia and other countries have been pressing to achieve as much as half their greenhouse gas reductions not at the source but by using ''sinks'' like forests to remove carbon dioxide.

In the last round of talks, which ended last week in Lyon, France, some countries were still seeking treaty language that could allow some new planting to occur on land that was recently cleared of old forest and get credit for greenhouse-gas reductions, said Mr. Gurney, who attended the talks as an observer.

David B. Sandalow, an assistant secretary of state who was the chief American delegate in Lyon, said that the treaty drafts so far could theoretically allow such a practice but that the United States was seeking to prevent this.

''We're committed to protecting old growth and finding ways to address this issue,'' Mr. Sandalow said.

The German study, together with other similar research, has produced a picture of mature forests that differs sharply from long-held notions in forestry, Dr. Schulze said. He said aging forests were long perceived to be in a state of decay that releases as much carbon dioxide as it captures.

But it turns out that the soils in undisturbed tropical rain forests, Siberian woods and some German national parks contain enormous amounts of carbon derived from fallen leaves, twigs and buried roots that can bind to soil particles and remain for 1,000 years or more. When such forests are cut, the trees' roots decay and soil is disrupted, releasing the carbon dioxide.

Centuries would have to pass until newly planted trees built up such a reservoir underground.

New forests are fine as long as they are planted on land that was previously vacant, Dr. Schulze said, adding, ''but there has to be a focus on preserving the old growth.''