

The Nicholas Environmental Notebook II*

Stories from the front line



Tradeoffs to Growing Trees for Carbon Storage

Many scientists and policymakers believe that planting more trees, which remove and store carbon dioxide from the atmosphere, can be an effective strategy for combating global warming.

But multi-institutional studies led by Robert Jackson, Nicholas Professor of Global Environmental Change at Duke University, suggest that local tradeoffs to growing big tree plantations could outweigh the benefits in some places.

Originating in a series of meetings at Duke's Center on Global Change, which Jackson directs, the studies identify a broad gamut of tradeoffs and benefits associated with using tree plantations for carbon sequestration at different locations worldwide.

"Decreased stream flow and changes in soil and water quality are likely as plantations are increasingly grown for biological carbon sequestration," Jackson says. "The extent and severity of these problems will vary by location, climate and tree species."

In arid or semi-arid former farmlands and open grasslands, the types of sites most often being considered for such projects, planting large numbers of trees could rob

local streams—and other local plants and animals—of water and lead to a buildup of salts in the soil. On average, tree farms retain about 20 percent more rainwater than crops or grasses, Jackson notes, and most of the trees being planted today are water-loving evergreen species such as pines and eucalyptus.

On the positive side, replacing crops and grasses with deep-rooted trees can help curb pollution from erosion and fertilizer and pesticide runoff.

Due to the Kyoto Accord and similar regional efforts, companies and governments worldwide are already planting millions of seedlings, or paying others to do it for them, to offset emissions.

"I think carbon sequestration with trees will work, at least for a few decades," says Jackson. "But as I tell my students, I think we're asking the wrong question. It isn't just, 'Can we store carbon in trees?' but also, 'What are all the environmental gains and losses involved with that?' We have to be smart about our sequestration policies."

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