CORRESPONDENCE

Boreal forests' carbon stores need better management

In the run-up to next month's climate-change treaty negotiations in Copenhagen, there is a pressing need to inform policy discussions about the importance of carbon management of northern boreal forests, as well as of tropical forests.

Boreal carbon pools account for more of the overall carbon stock than tropical forests — a minimum of 559–703 gigatonnes, compared with 375–428 gigatonnes — and store twice as much carbon per unit area (see R. T. Watson *et al. IPCC Special Report: Land-Use Change and Forestry* Cambridge Univ. Press; 2007, and E. S. Kasischke *Fire, Climate Change, and Carbon Cycling in the Boreal Forest* Springer; 2000).

In tropical forests, carbon flux is equilibrated between sequestration in growing trees and loss from decay of dead trees. Boreal ecosystems, on the other hand, accumulate carbon over millennia in soils, peat and sediments and under permafrost, because low temperatures prevent biotic breakdown and release of accumulated carbon.

The large carbon stocks and sequestration potential of tropical and boreal regions are under threat from deforestation and habitat degradation. The rapidly expanding human industrial footprint in boreal regions in Canada and Russia, for example, will increase the risk of releasing emissions from the vast carbon stores of these areas. To reduce climate disruption, efforts are needed at international, national and regional levels to develop incentives for encouraging protection of these intact ecosystems.

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Legal and practical pitfalls in making use of patents

Authors of research papers should use and cite online patent databases more frequently, according to a recent Correspondence (*Nature* **461,** 340; 2009), but from a US perspective, this is unsound advice.

An employee publishing a patent citation may be exposing his or her employer to liability for triple damages, and many firms ask their technologists to remain ignorant of the patent literature. US patent law awards triple damages for the period in which an infringer wilfully violates intellectual property. Ignorance is a valid defence against such a claim, so, before contemplating legal action, owners of intellectual property will often alert potential infringers, preemptively starting a wilful-violation clock. Widespread patent citation could even lead corporate lawyers to advise corporate scientists to avoid even reading or citing papers that cite patents.

Although patents represent rigorously reviewed novel work, they cannot be compared to peer-reviewed academic articles. The patent defines the invention (in its claims) and argues for its priority and novelty, minimizing the relevance of prior publications, whether legal or academic, along the way.

An examiner issues a patent only after rigorous review, but his or her report focuses on the patent's claims. Therefore the scientific validity of the patent's arguments and supporting data are not necessarily central to this review.

If the inventors (or others) later recognize serious flaws in the patent's data or scientific reasoning, they are under no obligation to retract or correct the patent. An invention is still valid and enforceable, and remains in public databases, even when the inventor got the science wrong.

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Water should take centre stage at climate talks

Political agreement on water rights and usage should be at the heart of climate-change conference discussions (see www.nature.com/roadtocopenhagen). Policy-makers, whose real agenda may be their standing with their electorates, should recognize that water is an ideal vehicle for reaching a useful aggregate agreement.

Water is where the impact of human-induced climate change is felt most keenly at a regional level. Demand is increasing, and the economic and social costs of extreme events such as floods and droughts are high. We should be ready to invest more in agricultural and industrial water-use efficiency, as well as in regional adaptation measures — bearing in mind that both water transport and desalination are very energy-intensive processes.

Globally, more than 32 trillion litres of treated water leak from urban water supply systems every year, according to the energy and water department of the World Bank (see go.nature.com/fLFTId). Last year, the UK water-industry regulator Ofwat reported that 22% of the water supply for England and Wales leaked away — 3.3 billion litres a day (see go.nature.com/3hJC7f). In developing countries, 40–50% of the supply may be lost this way.

The World Bank expects adaptation to climate change to cost US$75–100 billion a year until 2050 in developing countries alone (see go.nature.com/JCqkYq). The question of how to finance this is on the Copenhagen agenda.

One of the key requirements for success is to link incentives for sustainable water management with adaptation and mitigation strategies at a local scale. Local voters and governments are concerned with economic development, which is strongly linked to the security of water supplies, and are therefore most likely to support such measures.

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Sensible measures to guard India's groundwater supply

Satellite-based estimates of groundwater depletion in northwestern India reported by Matthew Rodell and colleagues (*Nature* **460,** 999–1002; 2009) should be backed up with precise ground-based information for the whole of India, taking into account regional variations in rock types, aquifers and watersheds. This will help to ensure effective local remedial action.

I have worked among poor farmers in Indian villages and believe that, if the government withdraws electricity subsidies for operating groundwater pumps in northern India, it could lead to drought in agricultural regions. Suicides among farmers have already occurred in response to drought in Maharashtra and Andhra Pradesh.

As the authors point out, use of groundwater in northern India needs to be sustainable. But drought should not be induced as part of the solution.

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