

Rethinking REDD+

Preventing deforestation can incur an opportunity cost for local communities who depend on forest resources for their livelihoods. A study by Fisher and colleagues seeks to account for these costs by comparing carbon losses from deforestation with the opportunity costs of carbon conservation in Tanzania, and by investigating the implementation costs of alleviating the demand for forest conversion to agriculture and for charcoal production.

[Letter p161; News & Views p143]



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Eastern promise

China and India — the world's two fastest growing economies — have been making incremental progress towards adopting market mechanisms to curb their escalating greenhouse-gas emissions. India's Perform, Achieve and Trade scheme is the backbone of a government programme that, after five years, aims to reduce emissions by 98.6 million tonnes of carbon per year, or 6% of India's 2009 emissions total. China's plans, which are less advanced than India's, so far amount to emissions trading and energy savings schemes at the provincial level, but support is strong for a domestic programme to integrate these various efforts. Though both schemes are delayed and imperfect, both should be applauded.

[Market Watch p138]

In the court room

As regulatory efforts to curb greenhouse-gas emissions are making slow headway, legal routes to achieve justice on climate change are being investigated. From activists appealing property-damage charges to the State of Connecticut bringing charges against American Electric Power, climate change is becoming an increasingly litigious

issue, and the better attribution science becomes, the more likely this trend is to continue. In a Feature, David Adam explores the legal story so far, focusing on the trials that will set a precedent for how climate cases fare in court in the future.

[Feature p127; Editorial p125]



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Acidified reefs

Ocean acidification due to anthropogenic carbon dioxide emissions has negative effects on many marine organisms, but the long-term impacts are less well known. A study into the effects of natural carbon dioxide seeps on coral reefs and seagrasses shows that, despite low rates of calcification, *Porites* corals can establish dominance over structural corals in acidic waters at pH 8.1 and ~7.8. However, reef development ceased below pH 7.7. The study confirms model predictions that acidification levels comparable to those projected for this century can contribute to reduced diversity and resilience.

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New narratives

The impacts of climate change on human systems depend not only on emissions but also on how inherently vulnerable these systems are. This depends in turn on the future development and

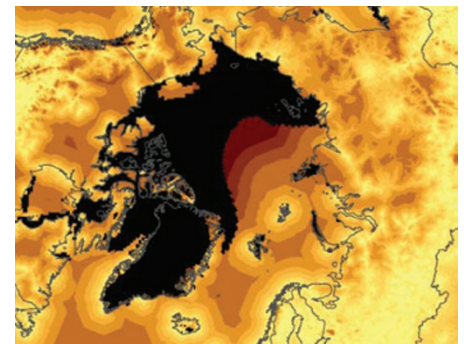
structure of societies and economies, and is typically dealt with through scenario analysis. A perspective by Hallegatte and colleagues identifies three dimensions of change that take into account the most relevant factors that define the vulnerability of human systems to climate change and their ability to adapt to it.

[Perspective p151]

Accessing the Arctic

Subzero temperatures at high latitudes typically restrict shipping but facilitate ground transportation. An analysis quantifies the impacts of climate change on Arctic transportation by mid-century and finds that all eight Arctic states will probably suffer steep declines of 11 to 82% in the land area accessible by winter roads, but will reap the benefits of faster sea travel during the summer months and an estimated increase in maritime-accessible ocean area of 5 to 28%. The North Sea Route, Arctic Bridge and North Pole shipping routes are projected to become fully accessible from July to September by mid-century, averaging about 11, 15 and 16 days respectively.

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STEPHENSON ET AL.

Material world

To meet climate change goals, at some point we will have to start making more with less, and sectors such as steel and aluminium manufacturing are already looking to material-efficiency measures to reduce costs and emissions. Focusing on the way that materials are used could make for more climate-friendly products, but could benefit other industries such as construction, which could make more of scrap metal from deconstruction. But how well do efforts at material efficiency meld with existing climate policy?

[Policy Watch p137]