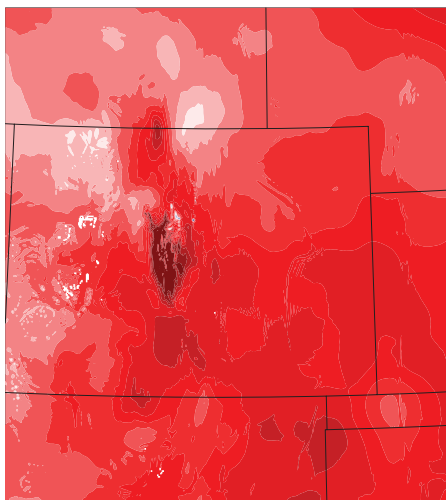


Colorado without hail

Global climate models cannot resolve hailstorms explicitly, so it is unclear whether a warmer climate will change hailstorm frequency and intensity. Now a study by Kelly Mahoney and co-workers using high-resolution model simulations capable of resolving hail-forming processes indicates the near-elimination of hail at the surface in projections for Colorado — a major centre of hailstorms in the United States. An increase in the height of the freezing level owing to climate warming is found to be the primary reason for the disappearance of surface hail, as the warmer atmosphere increases the melting of frozen precipitation. However, this is not entirely a good news story, because a decrease in surface hail increases rainfall intensity, potentially enhancing flood risk in the region.

[Article p125; News & Views p78]



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Carbon emissions embodied in trade

Quality of life improves with economic growth and hence requires increasing greenhouse-gas emissions. Little is known, however, about the influence of international trade. Now research by Julia Steinberger and co-workers — which uses recent consumption-based measures of national carbon emissions — explores how the relationship between human development and carbon use changes when values are adjusted for trade. Without such adjustment, some nations seemed to be getting far better development returns for their carbon use than others, who were showing scant gains for a disproportionate share of global emissions. Adjusting for the transfer of emissions through trade explains many of these outliers and shows

that most socio-economic benefits are actually accruing to carbon-importing countries. The study also finds that high life expectancy is compatible with low carbon emissions, but high incomes are not.

[Letter p81; News & Views p79]

Voluntary mitigation

From China and Mexico to Papua New Guinea and Sierra Leone, developing countries are submitting proposals for nationally appropriate mitigation actions (NAMAs) to the United Nations. NAMAs were introduced at the Bali climate talks in 2007 and are designed to help developing countries cut carbon emissions in a sustainable way. Ideally, developing countries undertake voluntary actions to reduce their carbon emissions in return for assistance from developed countries. However, NAMAs are still an area of policy development and much detail is yet to be established. Sonja van Renssen examines the latest developments, which indicate that developing countries can reduce their greenhouse-gas emissions through voluntary actions, but they need the full support of developed nations — something that is yet to materialize.

[Policy Watch p71]

Following the money

In December 2011, BankTrack — a network of civil society organizations that investigates the banking industry — released a report that, for the first time, revealed which banks invest most heavily in the coal industry. Perhaps surprisingly, the report finds that banks' total investments in coal in 2010 were almost twice what they were before the financial crisis in 2005. Anna Petherick reports on the findings and asks how this data should be used, suggesting that perhaps the best performers should be applauded as loudly as the worst are derided.

[Market Watch p72]

Sustainable building standards

The market for building construction in the United States is estimated to be worth nearly US\$1 trillion per year. Combined with buildings' consumption of energy and electricity (42% and 67% of national use, respectively), it is not difficult to see the environmental importance of sustainable building practices. In a Commentary, Jorge Contreras and co-authors argue that a lack of common language and measurement make sustainability standards and certification difficult

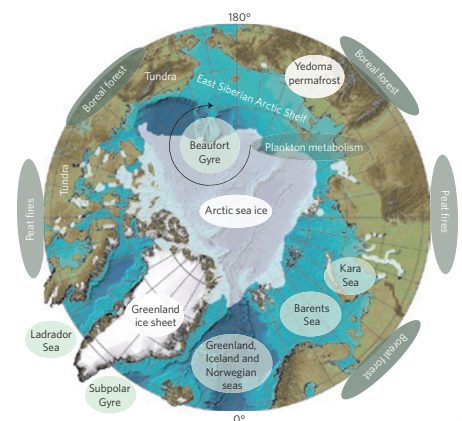
to compare meaningfully, causing significant confusion in the marketplace and obscuring their positive effect. To address this shortcoming, they propose a new framework for sustainability standards as well as an accessible public database for data on the sustainability of materials.

[Commentary p62]

Dangerous climate change

In a Commentary, Carlos Duarte and co-authors argue that environmental changes in the Arctic region can already be characterized as dangerous, according to the five criteria listed by the Intergovernmental Panel on Climate Change. They go on to suggest that appropriate responses are being delayed in part because of a semantic debate about whether Arctic sea ice has a tipping point, which is distracting attention away from the urgent need to take action. As a solution, they propose refocusing efforts to develop early warning indicators of abrupt change in the Arctic, which will help with the development of adaptation strategies. They also highlight the need to address the anthropogenic causes of these changes, including short-lived forcing agents such as soot, methane and low-level ozone.

[Commentary p60]



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Lifestyle choices

University of Colorado energy-behaviour researcher Karen Ehrhardt-Martinez — who in June 2011 became director of the Climate, Mind and Behavior Program at the Garrison Institute in upstate New York — believes that society can cut its energy use cheaply by up to 30% through behavioural changes alone. In an Interview, she talks about achieving practical change.

[Interview p69]