

## INTERNATIONAL GOVERNANCE

### Domino effect

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There are now more than 500 climate change laws across 66 jurisdictions. Prior to leaders signing the Kyoto Protocol in 1997, the world's only binding climate treaty, there were fewer than 40.

Samuel Fankhauser, from the London School of Economics, UK, and colleagues assess whether global climate deals are the cause of such proliferation. They find that treaties catalyse legislation in the limited number of countries bound by them, but don't have much impact in other jurisdictions.

A more persuasive explanation for the legislative boom is that governments react to other countries passing laws, creating

a sort of domino effect. This seems to override any temptation for countries to take advantage of the efforts of others. The international negotiation process also has a surprising side-effect: countries hosting major climate conferences are galvanized into passing climate laws. Such findings suggest that it is unwise to fixate on formal international commitments as an indication of a country's commitment to tackling climate change. *MH*

## MARINE BIOGEOCHEMISTRY

### Calcification changes

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Increasing anthropogenic emissions are causing a greater amount of CO<sub>2</sub> to enter the ocean, resulting in it becoming more acidic. It has been shown that ocean acidification can impact the biological formation of calcium carbonate — which facilitates carbon sequestration through export to the deep ocean. To calculate how calcification rates in the Southern Ocean have changed from 1998 to 2014, Natalie Freeman and Nicole Lovenduski from the University of Colorado, Boulder, USA, used satellite estimates of productivity, calcium carbonate (particulate inorganic carbon) and sea surface temperature.

They find a 4% decrease in calcification across the Southern Ocean for the summer months (December–February) over the 16-year time period. This finding was further investigated in four subregions with significant trends. In the three selected regions in the Indian and Pacific sectors there were reductions of ~9%. Analysis

of the changes in calcification shows that particulate inorganic carbon is the primary driver, with ~24% decrease in those regions. The Atlantic region, however, showed an increase in calcification (14%) because of a shift in the Polar Front location, which allowed the calcifying species to become more dominant. *BW*

## FOREST ECOLOGY

### Amazon carbon dynamics

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The mechanisms through which tropical forests respond to drought remain poorly resolved and this also limits understanding of the implications of drought events for the carbon cycle. This is particularly problematic in forested tropical regions where droughts are expected to increase in frequency and severity.

Christopher Doughty, from the University of Oxford, and co-workers use measurements of net primary production, autotrophic respiration and heterotrophic respiration from a network of forest monitoring plots spread throughout South America to develop a better understanding of the mechanisms of forest response to the 2010 drought. They find that drought suppresses photosynthesis and that trees compensate for reductions in energy by prioritizing growth at the expense of investment in tissue maintenance and defence. The authors propose that this reduced investment in maintenance and defence may be responsible for the observed increase in tree mortality in the years following the 2010 Amazonian drought. *AB*

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## CLIMATE POLITICS

### Follow the leader

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Bilateral climate change agreements are becoming increasingly important as the UN's all-encompassing international negotiations continue to stall. The EU proclaims itself a leader in these discussions, but is still struggling to attract followers.

Diarmuid Torney, of Dublin City University, UK, conducted interviews with influential policymakers and business people to establish why the EU has only had a limited impact on the climate policies of two of the world's most significant emitters, China and India. Torney finds that the EU's reluctance to alter how it frames climate change debates — moving away from climate protection narratives towards an emphasis on co-benefits such as job creation and economic development — limited European negotiators' influence.

His results indicate that while the EU had some success at keeping climate change on China's political agenda, policy advances were largely the result of domestic developments. In contrast, as EU negotiators were reluctant to engage India's policymakers on their own terms, appeals often fell on deaf ears, with some officials interpreting them as hostile. This refusal to alter its negotiating approach ultimately limits the international influence of the EU, making other countries unwilling to follow the leader. *MH*