ATMOSPHERIC SCIENCE

Mean and extreme snowfall

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JOHNNY LYE/THINKSTOCK

Snowfall is a key component of the Earth system that has important climatic, ecological and societal implications. Climate models indicate that mean snowfall will decline with warming in most regions, but with some increases in very low-temperature regions. However, the response of heavy (extreme) snowfall events — which have particularly large human impacts — remains less clear.

Paul O'Gorman from the Massachusetts Institute of Technology uses a climate model ensemble (taken from the Coupled Model Intercomparison Project Phase 5, under a high emissions scenario) and physically based theory to investigate changes in average and extreme Northern Hemisphere snowfall in response to twenty-first century climate change.

He finds that average snowfall declines with warming — in line with expectation — and snowfall extremes also decline in most regions, but the response is generally weaker than for the mean. This is explained by snowfall extremes occurring close to an optimal temperature that is insensitive to climate warming, which leads to smaller fractional changes at higher daily snowfall levels. These findings suggest that heavy snowfall impacts may not decline substantially under climate change and that snowfall extremes may be a poor candidate for climate change detection. *AB*

SCIENCE/POLICY INTERFACE

The middle ground

Environ. Sci. Policy http://doi.org/vj3 (2014)

The science/policy interface is an inherently contested territory. Efforts to tackle complex social and environmental challenges — of which climate change is an exemplar — raise further challenges to the traditional relationship between scientists as 'truth seekers' and actors as advocates of a political agenda working at this interface.

Manjana Milkoreit from Arizona State University and co-authors investigate this tension in the context of resilience science, which is concerned with the linkages between social and natural systems viewed through a complex systems lens. They argue that resilience science rests on concepts that carry 'value commitments' and that as the application of these concepts from local to global governance advances — as illustrated by the concept of planetary boundaries — it becomes increasingly important that resilience scholars embark on an explicit debate about the nature of their role in policy processes. Such reflective processes may help resilience scientists, and perhaps all those engaged in science policy debate, to navigate the contested middle ground between science and politics. *AB*

CLIMATE POLICY

Adaptation and mitigation

Climatic Change http://doi.org/vj2 (2014)

Adaptation and mitigation are conceptually complementary strategies for minimizing climate change impacts. Whether these approaches are, in practice, treated in an integrated way is another question. This is potentially important because failure to join up strategies could lead to policy conflicts.

Pam Berry from the University of Oxford and co-workers searched for literature-based evidence of interactions between adaptation and mitigation measures across a number of sectors (agriculture, biodiversity, coasts, forests, urban and water). Focusing on Europe, they found that adaptation and mitigation interactions were rarely explicitly mentioned within a single sector, let alone between sectors. Nevertheless, they also found that most measures did have some effect (positive, neutral or negative) on another sector. Many of the positive cross-sectoral interactions identified involved water and/or biodiversity, so the authors suggested these as potentially good starting places for the implementation of integrated, cross-sectoral strategies. They concluded that many local-scale measures could facilitate integration between both adaptation and mitigation, but that this requires explicit recognition of these cross-sectoral interactions of adaptation and mitigation measures. *AB*

ENERGY ECONOMICS

From cost to price

Am. Econ. Rev. **104,** 2872–2899 (2014)

ROSEMARY ROBERTS / ALAMY

The European Emissions Trading Scheme (ETS) is opposed by some owing to its likely effect on electricity bills, as the cost of emissions permits can be passed through to output prices. Lack of clarity about the extent and drivers of this pass-through may hinder ETS reform.

Natalia Fabra of Universidad Carlos III, Spain, and Mar Reguant of Stanford University, USA, analysed the effect of the European ETS in the Spanish electricity market. They constructed a data set of hourly electricity supply functions from Spanish producers over January 2004 to February 2006. They quantified the cost pass-through without imposing strong assumptions on the behaviour of electricity demand or supply due to the micro-level data used. They found an average pass-through above 80%. They also found that firms are more able to pass-through carbon costs in periods of high demand. This evidence demonstrates that power companies benefitted both from the allocation of free permits and from the increase in electricity prices. The expectations of rising electricity bills following a tighter ETS could be attenuated only if these gains are avoided through good market design. *MC*

Written by Alastair Brown and Monica Contestabile.