

Social dilemma

It is often remarked that international negotiations on climate change have the form of that well-known puzzle in game theory — the Prisoner's Dilemma. Unless everyone can be trusted to cooperate, an individual's interest is best served by hoping that others collaborate, while free-riding on their efforts. Dilemmas of this nature are as a real for ordinary citizens — people faced with choices about whether to expend effort in changing their diet or take to the streets to demand more proportional government action — as they are for their political leaders. Given the ubiquity of such dilemmas, it's important to ask what, in psychological terms, determines how people respond when confronted with them, writes Tom Crompton.

[Commentary p276]



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Priming the soil

An increase in primary production over recent decades has been attributed to increased atmospheric CO₂ concentrations. This has led to expectations that many ecosystems will act as vast stores of carbon, sequestering CO₂ that would otherwise accumulate in the atmosphere. Now Emma Sayer and colleagues challenge that assumption in a six-year study of the effects of increased litterfall in a Panamanian rainforest. They report that litterfall can stimulate the release of soil organic carbon in tropical forests by 'priming' or stimulating the activity of soil microbes. This creates a positive feedback that could lower the carbon sequestration potential of tropical forest ecosystems.

[Letter p304; News & Views p295]

Damage to genetic diversity

Climate impacts on biodiversity are usually assessed at the morphospecies level. These assessments indicate that large-scale loss

of species can be expected as temperatures rise. However, how climate change will affect biodiversity at the genetic level is less well known. Steffen Pauls and colleagues have analysed the distribution and mitochondrial DNA variability of nine mountain-dwelling aquatic insect species in Europe. They show that range contractions will be accompanied by severe loss of genetic diversity as the climate warms. Their results imply that morphospecies-scale assessments of biodiversity impacts may greatly underestimate the potential losses from climate change.

[Letter p313]

Reappraising the Copenhagen Accord

The Copenhagen Accord, signed by political leaders in 2009, was seen by many as a cop-out. Critics saw a loose agreement based on voluntary targets that in themselves failed to offer virtually any hope of keeping global temperature rise below 2°C. However, an analysis by economists Carlo Carraro and Emanuele Massetti, discussed in this issue, shows that this view might be overly pessimistic, as the Copenhagen Green Climate Fund — the second, and so-far less-appreciated, pillar of the Copenhagen Accord — could facilitate the additional reductions needed to avoid dangerous climate change.

[News & Views p297]



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Cover for calcifiers

Ocean acidification poses a threat to marine calcifiers, but their response varies widely. Some organisms, including crabs and lobsters, seem to produce shell material faster in moderately more acidic waters, but others, such as tropical reef-building corals, calcify more slowly under such conditions. Riccardo Rodolfo-Metalpa and colleagues show that for three types of marine calcifiers — corals, mussels, and limpets — total skeleton or shell growth declines under high-CO₂ conditions, but the rate of CaCO₃ accretion beneath calcifying tissue actually increases. Their research suggests that the

ability to continue shell and skeleton growth in corrosive sea water is determined in part by the existence of outer organic protective layers. High temperatures, however, modify resistance to acidification.

[Letter p308; News & Views p294]



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The big squeeze

It is a commonly held view that as fossil fuel prices rise, renewables become more competitive. But is this relationship so simple? As the price of oil rises, so too does the cost of developing and deploying alternative technologies. Everything from the cost of materials needed to produce renewables infrastructure to the transport fuel needed to deliver it will affect the end cost of the renewable, as well as the cost of electricity production. Mason Inman reports on the complex challenge of developing new fuel sources when existing fuel prices are high.

[Feature p278]



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