Experience alters perception

Engaging the public in western society with climate change has proved difficult, in part because most people see the problem as remote. In this issue, Alexa Spence, at the University of Nottingham, and co-workers present empirical evidence that direct experience of extreme weather events increases concern about climate change and willingness to engage in energy-saving behaviour. Previous studies have failed to find a link between personal experience of flooding and attitudes towards climate change. Spence *et al.* used a sample that is representative of the entire UK population and assessed 'mediating' perceptions and beliefs, lending credibility to their results.

[Letter p46; News & Views p25]

Expanding standards

Vehicle-emission regulations are known to be effective at protecting air quality and health, but their climate benefits are not well understood. In this issue, Shindell *et al.* investigate the potential effect of applying stringent European vehicle-emission standards for non-carbon dioxide pollutants in a number of developing countries. The study indicates that — relative to no additional controls — enforcing these regulations could mitigate near-term climate change and provide large benefits for human health and food security.

[Article p59; Beyond Boundaries p68]

The secret of success

Parts of Antarctica have experienced warming nearly an order of magnitude greater than the global average over the past 50 years. Polar environments are particularly sensitive to changes in climate. Perhaps the most notable impact has been a dramatic expansion of the two species of flowering plant that occur on the continent — Antarctic pearlwort and Antarctic hair grass. In this issue, research by Hill *et al.* demonstrates that the proliferation of Antarctic hair grass may in part be explained by the plant's ability to acquire nitrogen in the form of short-chain proteins, which gives it a competitive advantage over other plants as the climate warms.

[Letter p50; News & Views p28]

Communicating climate risk

Deciding on appropriate climate policies is a societal problem, but one that must draw heavily on science. Explaining the risks and uncertainties in scientific assessments to non-specialists is, however, fraught with difficulties. An array of principles and guidelines has been developed to aid this process, but there is little empirical evidence for their efficacy. In a Perspective, Pidgeon and Fischhoff identify the communications science that is needed to effectively convey the practical implications of large, complex, uncertain physical, biological and social processes. They draw up an ambitious interdisciplinary initiative to deliver effective climate science communication, including the institutional support needed to sustain it.

[Perspective p35]

Drought dilemma for maize

Understanding how extreme weather events — predicted to become more frequent in the future — affect yields and total production of the world's food crops is an issue of scientific and societal importance. Using data from 20,000 historical crop trials in Africa, Lobell *et al.* suggest that crops will cope better with high temperatures when they have sufficient water. They find that for each 'degree day' the crop spends above 30 °C — a measure that accounts for the amount and duration of heat experienced by the plant — the yield decreases by 1% if the plants are rain-fed. Under drought conditions, yields decrease by 1.7% for each degree day spent over 30 °C. For a temperature rise of 1 °C, optimal rain-fed conditions would mean 65% of maize-growing areas in Africa would be likely to experience yield losses, compared with 100% under drought conditions.

[Letter p42; News & Views p27]

Aviation's greatest impact

Tempering the impact of aviation on climate is of considerable public and political interest. Understanding the influence of aviation on climate is complicated, however, because its climate impact results from a number of different factors, from the emission of greenhouse gases to the formation of condensation trails. These 'contrails' eventually dissipate into spreading contrails, which are indistinguishable from cirrus clouds. Burkhardt and Kärcher use a global climate model to quantify the climate effect of spreading contrails — the least well quantified of all the aviation-related climate-forcing agents. The authors find that although short-lived their influence at any given point in time may have a stronger radiative impact than all of the carbon dioxide emitted by aircraft since the start of aviation.

[Article p54; News & Views p24]