ECOLOGICAL IMPACTS
Types or traits?
Proc. Natl Acad. Sci. USA **110,** 18180–18184 (2013)

Investigating the response of plants to climate change typically involves categorization into simple fixed functional types (such as grasses, shrubs and so on). This can be a powerful approach for capturing and modelling the impacts of climate on plants and the associated biogeochemical feedbacks, but it has the drawback that much of the variety in the way that individual species function is lost in the classification process.

To address this shortcoming Nadejda Soudzilovskaia, from VU University Amsterdam, the Netherlands, and co-workers investigated the potential of plant functional traits — associated with particular plant features — to explain the responses of vegetation to environmental change.

In their test site in the Caucasus Mountains in Russia, they found that the traits that promote minimal water use in leaves — such as greater leaf mass per area, and large belowground reserves, indicated by root carbon content — were the best predictors of species that increase their abundance in association with rising temperatures. This aproach shows promise for improving the forecasting of plant responses to climate change.   *AB*

OCEANOGRAPHY
Historical ocean heat
Science **342,** 617–621 (2013)

In recent years, global surface temperatures have had smaller increases than expected, with the ocean warming instead.

Yair Rosenthal, of Rutgers University, USA, and co-workers report on Pacific Ocean heat content for the last 10,000 years to provide context for current changes. They use proxy records from sediment cores collected around Indonesia for the reconstruction.

Intermediate (~450–900m depth) water temperatures are shown to cool by 2 °C from 7,000 years ago until the last century. During that period, the upper ocean did not have such a significant change, with sea surface temperature cooling around 0.5 °C from 9,000 years ago to the twentieth century. Although the Pacific Ocean heat content has been higher over the Holocene than the present day, a comparison with the past decade indicates that the current rate of change is the higher than the long-term trend. The ocean heat content responds slowly to surface changes, and the recent rapid increase shown here indicates that the committed response from anthropogenic forcing may be large.   *BW*

PSYCHOLOGY
Translations matter
Climatic Change http://doi.org/pzb (2013)

The Intergovernmental Panel on Climate Change (IPCC) communicates information on risk and uncertainty with probabilistic statements and provides the inferred numerical ranges at the outset of the reports. However, interpretations of those expressions by non-experts can vary.

Evidence has shown that words such as 'likely' are subject to personal interpretations, even with guidance about the implied probability range. Translation of statements into different languages also raises issues of cross-cultural interpretations.

Adam Harris, of University College London, UK, and colleagues analysed how the British and Chinese public interpret the IPCC's probabilistic phrases in the absence of information on numerical ranges. They surveyed university students (Study 1) and people approached in parks (Study 2) in both China and the UK, and found that their understanding differed from the IPCC's numbers. Chinese participants provided a broader variety of interpretations and departed much more from the IPCC's numbers than British participants. The researchers recommend increased use of numerical ranges in IPCC reports.   *MC*

ENERGY POLICY
Ending nuclear power
Clim. Policy http://doi.org/pzc (2013)

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The Fukushima Daiichi accident in 2011 — and the consequent public reactions — has led countries to revisit plans about nuclear energy. However, limiting or discontinuing nuclear power generation (such as Sizewell A, pictured, which closed down in 2006)could increase the costs of international climate policy.

Vicki Duscha, of the Fraunhofer Institute for Systems and Innovation Research, Germany, and co-authors used a global energy systems model to analyse the effects of a nuclear phase-out on the costs of compliance with mitigation policy. Greenhouse gas emissions would increase by 2% globally and 7% in countries with binding reduction targets under the Kyoto Protocol (Annex I countries), whereas the price of emissions certificates would increase by 24%. The total costs of meeting the 2020 pledges agreed in Copenhagen for Annex I countries would rise by 28%. Japan and the USA would be the most affected, particularly without access to certificate trading owing to non-participation in a second Kyoto commitment period — meeting policy targets would be much more expensive.   *MC*

Written by Alastair Brown, Monica Contestabile and Bronwyn Wake.

ATMOSPHERIC SCIENCE
Natural aerosols
Nature **503,** 67–71 (2013)

Little is known about the effect of changing atmospheric aerosols on cloud processes or the associated radiative forcing. Large uncertainties in the impact of aerosols on cooling the climate limit our confidence in understanding climate sensitivity to greenhouse gas emissions.
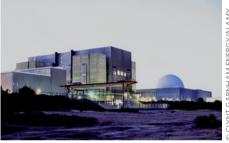
To determine the uncertainty caused by anthropogenic aerosols, Ken Carslaw, of the University of Leeds, UK, and colleagues performed a sensitivity analysis on a global aerosol model. By comparing model simulations for pre-industrial (1750) to near present day (2000) aerosol distributions they quantify the sources of uncertainty.

Natural emissions, such as those from volcanos, oceans and biomass burning, are found to account for 45% of uncertainty in the forcing change since 1750. Anthropogenic emissions account for 34%. Choosing different reference years shows that natural emissions remain a large source of uncertainty. These results highlight the need to understand pristine environments, such as the pre-industrial, to improve model representation of this variable.   *BW*