

35% of the urban landscape, respectively. If the use of 'cool' roofs and pavements had boosted the reflectivity of these surfaces by 25% and 15% respectively, the average midday summertime temperature in cities during the 12-year interval would have been between 0.11 °C and 0.53 °C lower than it actually was, the researchers estimate.

However, the analyses also suggest that the temperature in some rural areas, particularly those downwind of the cities, would have been as much as 0.27 °C hotter, largely due to decreased cloudiness and lower precipitation. SP

AGRICULTURE

Drought in China

J. Clim. **24**, 3257–3271 (2011)



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An analysis shows that over the past 60 years severe droughts in China were frequent and grew increasingly common, even though many were not widely reported.

Aihui Wang, of the Institute of Atmospheric Physics in Beijing, China, and her colleagues looked at changing soil moisture levels across the country between 1950 and 2006 using four models. After checking that the models showed only limited variation in their outputs, they combined the findings to generate a geographic map of moisture variations for the period.

Overall, 37% of China's area became drier, while 22% got wetter. Northern and central regions experienced the most severe drying trends, according to the map, suggesting an increasing risk of agricultural failure in the future if the trend continues. Indeed, the winter drought that hit the northeast in 2008–2009 led to economic losses of \$2.3 million and left more than 10 million people struggling with water shortages. The authors note that climate models predict that China's summer monsoon will become more intense everywhere, which should offset the macroscale drying trend. AP

ECONOMICS

Sponsoring eco-standards

J. Environ. Econ. Manage. <http://dx.doi.org/10.1016/j.jeem.2011.03.009> (2011)

Eco-certification programmes for products and services have increased in number over the past 20 years — there are now over 30,000 programmes in Japan, more than 300 in the European Union and around 150 in the US. These programmes are run and authorized by certification bodies either in industry, government or non-government organizations (NGOs). These bodies set environmental standards and compliance rules, and regulate access to certification, which sometimes requires a fee to be paid.

Klaas van't Veld of the University of Wyoming and Matthew J. Kotchen of Yale University set out to see if there was a difference in whether certification was regulated and managed by industry, public bodies or NGOs. The results from their modelling experiment suggest that if improving the environmental standards of a product is directly linked to benefits for the product's users, such as energy efficiency improvements, then industry may be best placed to regulate the certification process. Where there are few direct benefits to the product's users, such as for sustainably sourced timber, NGOs would best manage the certification.

Government may best manage the certification when users could not otherwise be confident in the regulatory process, they suggest. MC

MARINE CHEMISTRY

Gassy archaea

Science <http://dx.doi.org/10.1126/science.1208239> (2011)

About a third of all atmospheric nitrous oxide originates in the oceans, where, it had been believed, bacteria produce the majority of this potent greenhouse gas. An analysis, however, shifts the blame to another group of single-celled microorganisms more closely related to eukaryotes — archaea.

Alyson Santoro, from the Woods Hole Oceanographic Institution, and colleagues cultured archaea from the Pacific Ocean in the laboratory to investigate their role in nitrous oxide cycling. They also undertook nitrogen- and oxygen-isotope analyses to investigate the dominant origin of marine nitrous oxide.

The results indicate that nitrous oxide produced by archaea through the oxidation of ammonia has an isotopic signature more similar to that found in ocean surface waters

than the signature produced by bacteria. This finding suggests that archaea, rather than bacteria, are responsible for most of the nitrous oxide released from the oceans into the atmosphere. AB

AEROSOLS

Temporary cooling

Science **333**, 866–870 (2011)



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Increasing concentrations of light-scattering aerosols in the stratosphere during the past decade may have slowed the pace of global warming, a study suggests.

Using data gathered by a variety of satellites and ground instruments, John Daniel, an atmospheric scientist with the National Oceanic and Atmospheric Administration in Boulder, Colorado, and his colleagues assessed recent trends in stratospheric aerosols. From 2000 to 2010, those aerosols increased, on average, by about 7% each year, decreasing global radiative forcing by about 0.1 W m⁻² and, correspondingly, global average temperatures by about 0.07 °C. This cooling effect helped counteract about 20% of the warming that would have occurred without these aerosols, the researchers contend.

It isn't clear what is responsible for the increase in stratospheric aerosols — volcanic eruptions are one possible source — nor is it yet possible to determine the proportion attributable to humans, the researchers report. If during the coming decade the concentration of stratospheric aerosols drops back to levels seen in 1960, global average temperatures would rise by an additional 0.06 °C, they estimate. SP

Written by Anna Petherick, Sid Perkins, Alastair Brown and Monica Contestabile.

Correction

In the research highlight 'Agriculture: On good farming' (*Nature Clim. Change* **3**, 190; 2011) Delphine Deryng's affiliation should have read McGill University, Montreal, Canada. Corrected in the HTML and PDF versions, after print: 29 July 2011.