

The slowdown is probably a result of natural variability rather than climate change, the team says, and is likely to reverse within a few years. Understanding such fluctuations is important for climate prediction, and more data will come from the Rapid Climate Change Project's array of 20 moored instruments, installed in 2004 between the Canary Islands and the Bahamas.

NJ

FORESTRY

Selective logging

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Tropical deforestation contributed about 16% of the total anthropogenic carbon emissions between 2000 and 2006. In addition to releasing carbon into the atmosphere, deforestation changes land surface reflectivity, which affects regional temperature and precipitation patterns. Reduced-impact logging, which selects certain valuable trees, is intended to minimize disruption of the forest canopy, but the effect of this logging practice on land-atmosphere carbon exchange has not been well quantified.

Scott Miller of the Atmospheric Sciences Research Center at the State University of New York, US, and co-workers measured

carbon dioxide exchange and various ecological parameters to investigate the effects of selective logging on carbon exchange in an old-growth Amazonian forest.

Results suggest that the logging caused small decreases in primary production, leaf production and latent heat flux, and increases in respiration, tree mortality and wood production. The net effect of reduced-impact logging was short lived and effects were barely discernible after only one year. The authors suggest that reduced-impact logging provides a potential strategy for managing tropical forest that minimizes risks to the climate. AB

TECHNOLOGY

Liquid hydrogen

J. Am. Chem. Soc. 133, 19326-19329 (2011)

Fuel-cell cars — which run on hydrogen and emit only water from their tailpipes — offer a compelling way to reduce transport emissions. However, manufacturers have struggled to find ways of safely storing enough hydrogen in a car for long journeys.

Researchers have now taken a step towards an alternative: storing the hydrogen as a liquid. University of Oregon chemist Shih-Yuan Liu and colleagues report the creation of a new material: BN-methylcyclopentane, a five-membered cyclic amine borane that is a stable liquid at room temperature and pressure. When a cheap iron chloride catalyst is added, three of these rings chemically join together, releasing hydrogen in the process.

Liu's work was funded by a US Department of Energy project that is aiming to develop a viable liquid or solid storage mechanism for hydrogen fuel by 2017. The team is now working to make recycling of their starting material cheaper and more energy efficient.

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BIOLOGY

Growing up too fast

Proc. R. Soc. B <http://rspb.royalsocietypublishing.org/lookup/doi/10.1098/rspb.2011.2000> (2011)



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For ectotherms — cold-blooded animals, including reptiles and amphibians, which cannot regulate their temperature through their own metabolism — environmental temperature changes “literally change the pace of life,” according to Wenyun Zuo, of the University of New Mexico in Albuquerque, and colleagues.

Ectotherms develop from infancy to adulthood more quickly in warmer conditions, and increase their body mass faster too. Most ectotherms follow a temperature-size rule, whereby the warmer the temperature, the smaller the animal is at maturity. But for about 15% of species, the reverse holds: the warmer it is, the larger they get.

Zuo's team explains this oddity with a simple mathematical model, in which the rate of biomass accumulation and the pace of maturity have different temperature dependences. The usual size rule applies for those animals in which temperature has a stronger affect on development rate than on body mass accumulation. The model shows that these animals not only mature more quickly at warmer temperatures, but also use less energy to do so, giving them an evolutionary advantage in most conditions. Their model could be used to predict the effects of climate change on various species' body sizes, the authors say.

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Written by Nicola Jones, Monica Contestabile and Alastair Brown.

MODELLING

Slower warming

Science <http://dx.doi.org/10.1126/science.1203513> (2011)

How much will our planet warm if carbon dioxide levels double from pre-industrial levels? In other words, what is the planet's 'sensitivity' to carbon dioxide?

This has proven a hard question to answer, mainly because of uncertainty about how aerosols and the ocean alter heating effects. The 2007 Intergovernmental Panel on Climate Change report set out a best estimate of 3 °C, with a 66% chance that the true answer lies between 2 °C and 4.5 °C, and a slight but real possibility of more than 10 °C of warming.

Now, Andreas Schmittner of Oregon State University, and colleagues, have produced a more precise answer by using a more complete temperature reconstruction of the last ice age — 21,000 years ago — than was previously available. Their warming estimate is 2.3 °C, with a 66% chance the answer lies between 1.7 °C and 2.6 °C. More than 6 °C of warming, the researchers conclude, would be implausible.

The latest estimate doesn't fully cover the impact of ice sheets, vegetation or clouds on climate sensitivity, so the numbers shouldn't be taken as definitive, the researchers caution. NJ