

RESEARCH HIGHLIGHTS

A watery carbon bank

Ecosystems 11, 643–653 (2008)

Dead wood can persist for more than a hundred times longer in rivers and floodplains than on land, sequestering carbon for centuries and even millennia, according to Richard Guyette of the University of Missouri in Columbia and his colleagues.

Although their terrestrial neighbours degrade within decades, the submerged oaks that Guyette's team studied held their carbon for an average of almost 2,000 years. The team found oak wood up to 14,000 years old in northern Missouri streambeds and floodplains.

The samples are among the oldest non-petrified oak trees known in North America. The aged wood retains its rings, and is a potential source of palaeoclimatic data.



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NEUROSCIENCE

Rewiring the brain

J. Neurosci. 28, 6592–6606 (2008)

The brain can recover so well from a stroke that initially paralysed limbs can be moved again. Scientists have discovered how this happens at the level of individual neurons.

Timothy Murphy and Ian Winship of the University of British Columbia in Vancouver induced stroke in adult mice and used an *in vivo* imaging technique called two-photon microscopy to monitor the activity of individual neurons close to the site of damage.

In the first month — when paralysis is usually at its worst — they found that some neurons ditched their speciality for one particular limb and began processing information from multiple limbs. During the following month, as the affected brain region reorganized itself more permanently, those neurons re-specialized to a new single limb.

MATERIALS

Colourful clay

Adv. Mater. doi:10.1002/adma.200702544 (2008)

Nanocrystals made of semiconducting materials glow different colours depending on their size.

Researchers are interested in using them in electronic devices, but first need to figure out how to attach them to more conventional silicon components.

Takeo Ebina and his colleagues at the National Institute of Advanced Industrial Science and Technology in Sendai, Japan, have come up with a technique for doing so. The researchers dissolved nanocrystals made of cadmium

selenide and zinc sulphide in water and mixed it into a clay–polymer mixture. They then poured the clay into moulds and dried it, creating a thin, flexible film filled with evenly spaced crystals. The team was able to make films glow various colours under ultraviolet light (pictured below) and hope the technique will allow nanocrystals to be integrated into optoelectronic devices.

REMOTE SENSING

Rainforest shrinkage

Proc. Natl Acad. Sci. USA 105, 9439–9444 (2008)

Despite growing international concern about the future of the world's rainforests, the rate of tropical forest clearance has not slowed.

A team used a combination of low- and high-resolution satellite data sets to quantify forest clearing in the humid tropics. Using a probability-based approach blending satellite data retrieved from NASA's Terra and Landsat missions, Ruth DeFries of the University of Maryland in College Park and her colleagues estimate that more than 27 million hectares of rainforest area — roughly 2.4% of the global rainforest cover — were cleared from 2000 to 2005.

The results suggest that tropical forest loss continues at rates roughly similar with those observed in the 1990s.

PLANT BIOLOGY

An egg-spedient defence

Proc. Natl Acad. Sci. USA doi:10.1073/

pnas.0707809105 (2008)

Some plants are known to attract parasitic wasps to eat the eggs laid on them by insects. However, the exact mechanisms of this complex defensive behaviour are not clear.

Nina Fatouros at Wageningen University in the Netherlands and her colleagues have determined that in one case the mechanism is triggered by a specific compound in male insect ejaculate. The ejaculate of male cabbage white butterflies (*Pieris brassicae*) contains anti-aphrodisiac benzyl cyanide to reduce female re-mating. This compound is then present on or around their eggs.

Application of benzyl cyanide induced chemical changes in the leaves of Brussels sprout plants, Fatouros's team found. As a result, the parasitoid wasp *Trichogramma brassicae* spent more time on treated leaves than on controls. So, for *P. brassicae* males, the anti-aphrodisiac trick has some cost.

ATMOSPHERIC CHEMISTRY

Forgotten gas

Geophys. Res. Lett. 35, L12810 doi:10.1029/2008GL034542 (2008)

Nitrogen trifluoride (NF₃) has been identified before as a greenhouse gas, but the threat it poses has barely been quantified. Michael Prather and Juno Hsu of the University of California, Irvine, have produced a new estimate of the atmospheric lifetime of NF₃ —



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