Journal content
- Journal home
- Advance online publication
- Current issue
- Archive
- Focuses
- Press releases

Journal information
- About the Journal
- Guide to authors
- About the Editors
- Online Submission
- Free online issue
- Subscription Information
- Register for TOC alert / e-newsletter
- Recommend this title

NPG resources
- Nature
- Nature Communications
- Nature Reports Climate Change
- Earth &

Press releases

Please quote *Nature Geoscience* as the source of these items.

February 2009

Previous | Next

A human hand in Indonesian fires

Severe fires in Indonesia — responsible for some of the worst air quality conditions worldwide — are linked not only to drought, but also to changes in land use and population density, reports a paper online in *Nature Geoscience*. Sumatra has suffered from large fires at least since the 1960s, whereas the environment in Indonesian Borneo changed from highly fire-resistant to highly fire-prone sometime between the droughts of 1972 and 1982.

Robert Field and colleagues found that airport visibility records, archived back to 1960 for the region, can be used for monitoring fire frequency in the period before satellite data. By analysing these records, the researchers defined a rainfall threshold, below which large fires have occurred in the past two decades. However Indonesian Borneo seems to have been resistant to large fires, even in dry years, until population density and deforestation increased substantially and land use changed from small-scale subsistence agriculture to large-scale industrial agriculture and agroforestry.

The researchers also found that fire-inducing droughts are not primarily linked to the influence of El Niño, as previously thought. Instead Indian Ocean climate patterns are equally important.

Human amplification of drought-induced biomass burning in Indonesia since 1960

R. D. Field, G. R. van der Werf & S.S.P. Shen
Published online: 22 February 2009 | doi 10.1038/ngeo443
Abstract | Full text

Aerosols and underlying clouds lead to warming

Aerosols that collect at the top of the atmosphere exert a greater

- environment web focuses
- earthsciences@nature
- news@nature
- Nature Publishing Group
- Scitable by Nature Education

NPG Journals
by Subject Area

Chemistry
- Chemistry
- Drug discovery
- Biotechnology
- Materials
- Methods & Protocols

Clinical Practice & Research
- Cancer
- Cardiovascular medicine
- Dentistry
- Endocrinology
- Gastroenterology & Hepatology
- Methods & Protocols
- Pathology & Pathobiology
- Urology

Earth & Environment
- Earth sciences
- Evolution & Ecology

Life sciences
- Biotechnology
- Cancer
- Development
- Drug discovery
- Evolution & Ecology
- Genetics
- Immunology
- Medical research
- Methods & Protocols
- Microbiology
- Molecular cell biology
- Neuroscience
- Pharmacology
- Systems biology

Physical sciences
- Physics

influence on warming when there are clouds located beneath them, suggests a paper online in *Nature Geoscience*. Aerosols, such as those produced from biomass burning, can alter the radiative balance of the Earth by reflecting and absorbing solar radiation. Whether they exert a net warming or cooling effect depends on the reflectivity of the underlying surface.

Duli Chand and colleagues used satellite data to quantify the warming effect of aerosols that were carried over the southeastern Atlantic Ocean. They found that the greater the cloud coverage below the aerosol layers, the more the aerosols warm the atmosphere. This relationship is nearly linear, making it possible to define a critical point where aerosols switch from exerting a net cooling effect to a net warming effect. They estimate that when this relationship between aerosols and underlying clouds is taken into account, regional warming is three times greater than otherwise predicted.

Satellite-derived direct radiative effect of aerosols dependent upon cloud cover

D. Chand, R. Wood, T. L. Anderson, S. K. Satheesh & R. J. Charlson

Published online: 22 February 2009 | doi 10.1038/ngeo437

Abstract | Full text

Geoscience: Relicts of martian ice?

The enigmatic 'Meridiani Planum' deposits on Mars — found by the Opportunity rover — could be remnants of a massive ancient ice-field, according to a study online in *Nature Geoscience*. Small pockets within the ice, where a thin film of water reacted with atmospheric dust, could have sustained an acidic environment capable of producing the unique chemical composition found in these deposits.

Paul Niles and Joseph Michalski analysed the chemistry, sedimentology and geology of the Meridiani Planum deposits using information obtained by the Mars rover Opportunity. They suggest that sulphate formation and chemical weathering occurring within an ancient ice-field — similar in size to the present polar ice caps on Mars — is the best explanation for the observations. Once the ice sublimed away in a warmer climate, the remaining sediments kept their chemical signature.

The region of Meridiani Planum is near the equator and at present cannot sustain large ice-fields. The authors propose that the ice could have formed in ancient times, when the poles were in a different place or when the martian axis of rotation was at a different angle to its present-day orbit around the Sun.

Meridiani Planum sediments on Mars formed through weathering in massive ice deposits

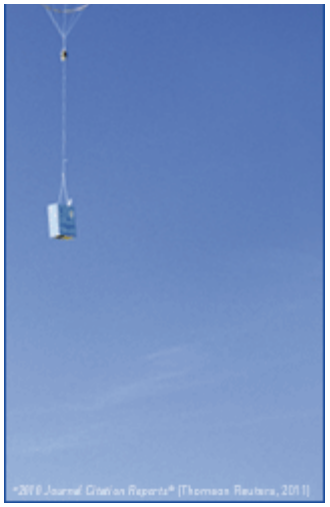
P. Niles and J. Michalski

Published online: 15 February 2009 | doi 10.1038/ngeo438

Abstract | Full text

Materials
by A - Z Index

Nitrous oxide hotspots



Subarctic tundra soils, one of the largest land cover types in the world, can release significant quantities of the potent greenhouse gas nitrous oxide, according to a study published online in *Nature Geoscience*. Until now, these treeless soils were considered a negligible source of nitrous oxide.

Pertti Martikainen and colleagues measured nitrous oxide emissions in semi-frozen Eastern European peatlands located below the Arctic Circle. Vegetation-free patches of peat were found to emit quantities of nitrous oxide equivalent to emissions from agricultural and tropical soils, which are considered to be the largest terrestrial sources of nitrous oxide. Extrapolation of their field data to the whole of the Arctic suggests that the global warming potential of these bare peat-patches could amount to 4% of the global warming potential of Arctic methane emissions.

These findings suggest that it will be important to consider the amount of nitrogen stored in subarctic tundra soils when assessing their climatic impact.

Large N_2O emissions from cryoturbated peat soil in tundra

M. E. Repo, S. Susiluoto, S. E. Lind, S. Jokinen, V. Elsakov, C. Biasi, T. Virtanen and P. J. Martikainen

Published online: 15 February 2009 | doi 10.1038/ngeo434

Abstract | Full text

top

Nature Geoscience ISSN 1752-0894 EISSN 1752-0908 This journal is printed on recycled paper