



# CLIMATE – NEWS

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ICFRE – CLIMATE CHANGE NEWS From the Biodiversity and Climate Change (BCC) Division, Indian Council of Forestry Research and Education, P.O: New Forest, Dehra Dun – 248006

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## CLIMATE CHANGE INTERNATIONAL NEWS

### THE GREENHOUSE EFFECT THAT MAY BE COOLING THE CLIMATE

10 October, 2008 New Scientist Environment

<http://www.newscientist.com/article/mg20026775.000-the-greenhouse-effect-that-may-be-cooling-the-climate.html>

Here is one greenhouse effect that is welcome: the roofs of hothouse farms in Spain reflect so much sunlight that they may be pushing down local temperatures. Since the 1970s, semi-arid pasture land in Almeria, south-eastern Spain, has been replaced by greenhouse horticulture. Today, Almeria has the largest expanse of greenhouses in the world around 26,000 hectares. Pablo Campra of the University of Almeria and colleagues studied temperature trends from weather stations inside the region, and from other areas of Spain. With the help of satellite data they compared semi-arid pasture land and greenhouses, looking for differences in surface radiation and albedo - the ability to reflect sunlight.

In the greenhouse region, air temperature has cooled by an average of 0.3 °C per decade since 1983. In the rest of Spain it has risen by around 0.5 °C. The satellite data revealed that the white greenhouses were much more reflective than farmland. (*Journal of Geophysical Research*, DOI: 10.1029/2008JD009912). The team thinks that the white roofs are key to the cooling, demonstrating the potential for placing reflective surfaces in semi-arid regions of the world to offset climate change

### CLIMATE CHANGE CAUSING DISEASES TO SPREAD

16 October, 2008 Jeanette Wiemers, Newsbriefs Editor

<http://www.climatechangecorp.com/content.asp?ContentID=5712>

Report names 'deadly dozen' diseases that could proliferate due to climate change. A dozen diseases including avian influenza, ebola, plague, and yellow fever could extend their reach

among human and animal populations due to variations in temperature and precipitation levels caused by climate change, says a report from the Wildlife Conservation Society. According to the report, these Deadly Dozen pathogens pose health threats to humans and wildlife, and carry a risk of destabilizing trade and the economy, as avian influenza and several livestock diseases have done recently.

## **IN HOT WATER**

Olive Heffernan

4 November, 2008 Nature Reports Climate Change,

<http://www.nature.com/climate/2008/0811/full/climate.2008.117.html>

The ocean's enormous capacity for soaking up greenhouse gases has gone some way toward softening the blow of escalating emissions; over the last century, the upper ocean has soaked up over 500 billion tonnes of fossil fuel carbon. But in acting as a buffer for the planet, the ocean itself has begun to suffer. Some of the harm is obvious; some is more obscure. Most notably, the seas are warming, having taken up around 20 times more heat than the atmosphere since 1960. For some time, it has been realized that the ocean will also become more acidic in a carbon-rich world. Now studies show it will become saltier and, rather surprisingly, noisier too. If, as predicted under some scenarios, the ocean's pH drops 0.3 units from its current value of 8.1 units by 2050, sound waves at one kilohertz and below could travel up to 70 per cent further underwater. This, say scientists, could crank up the volume of background noise, interfering with communication signals from marine mammals.

## **TREE FUNGUS COULD PROVIDE GREEN TRANSPORT FUEL: ORGANISM DISCOVERED IN THE PATAGONIAN RAINFOREST PRODUCES MIXTURE OF CHEMICALS SIMILAR TO DIESEL**

4 November, 2008 Alok Jha , green technology correspondent

<http://www.guardian.co.uk/environment/2008/nov/04/biofuels-energy>

A tree fungus could provide green fuel that can be pumped directly into tanks, scientists say. The organism, found in the Patagonian rainforest, naturally produces a mixture of chemicals that is remarkably similar to diesel. "This is the only organism that has ever been shown to produce such an important combination of fuel substances," said Gary Strobel, a plant scientist from Montana State University who led the work. "We were totally surprised to learn that it was making a plethora of hydrocarbons."

In principle, biofuels are attractive replacements for liquid fossil fuels used in transport that generate greenhouse gases. The European Union has set biofuel targets of 5.75% by 2010 and 10% by 2020. But critics say current biofuels scarcely reduce greenhouse gas emissions and cause food price rises and deforestation. Producing biofuels sustainably is now a target and this latest work has been greeted by experts as an encouraging step. The fungus, called *Gliocladium roseum* and discovered growing inside the ulmo tree (*Eucryphia cordifolia*) in northern Patagonia, produces a range of long-chain hydrocarbon molecules that are virtually identical to the fuel-grade compounds in existing fossil fuels.

Details of the concoction, which Strobel calls "mycodiesel", will be published in the November issue of the journal *Microbiology*. "The results were totally unexpected and very exciting and almost every hair on my arms stood on end," said Strobel.

Many simple organisms, such as algae, are already known to make chemicals that are similar to the long-chain hydrocarbons present in transport fuel but, according to Strobel, none produce the explosive hydrocarbons with the high energy density of those in mycodiesel. Strobel said that the chemical mixture produced by his fungus could be used in a modern diesel engine without any modification. Another advantage of the *G. roseum* fungus is its ability to eat up cellulose. This is a compound that, along with lignin, makes up the cell walls in plants and is indigestible by most animals. As such, it makes up much of the organic waste currently discarded, such as stalks and sawdust. Converting this plant waste into useful fuels is a major goal for the biofuel industry, which currently uses food crops such as corn and has been blamed for high food prices. Normally, cellulosic materials are treated with enzymes that first convert it to sugar, with microbes then used to ferment the sugar into ethanol fuel.

In contrast, *G. roseum* consumes cellulose directly to produce mycodiesel. "Although the fungus makes less mycodiesel when it feeds on cellulose compared to sugars, new developments in fermentation technology and genetic manipulation could help improve the yield," said Strobel. "In fact, the genes of the fungus are just as useful as the fungus itself in the development of new biofuels."

## **CLIMATE CHANGE TO HIT POWER, DAMS**

6 November, 2008

<http://news.smh.com.au/business/climate-change-to-hit-power-dams-20081106-5iya.html>

Electricity blackouts, dry dams and crumbling footpaths will be the consequences of climate change to Australia, a new report has found. Experts from the Australian Academy of Technological Sciences and Engineering have assessed the impact of global warming on infrastructure. The report warned electricity would be hardest hit and more interruptions to supply could be expected.

Drought would slash hydro-electric generation, while hot temperatures interfered with power plants and increased demand for electricity. More frequent bushfires would interrupt supply. Water infrastructure would also suffer due to more droughts across southern Australia. Major investment in water was needed to see these regions through extended droughts, the report advised. But while the south dries out, climate change is expected to bring more floods and storms to the rest of the country and that poses risks for low-lying buildings and roads. Newer houses are better able to withstand a changing climate, but the report found older homes, especially near the coast, were vulnerable to flooding and storms. Even footpaths will be hit by climate change droughts, floods and hot temperatures can cut their life span. Climate change is likely to affect almost all forms of infrastructure, the report found. Roads will need to be resealed more often due to the heat, airports in low-lying areas will be forced to close more often, and the roads and railways which carry minerals to port will be closed more frequently.

The report concluded that climate change posed "significant challenges" for Australia's infrastructure, and consequently people. "The consequences of the impact of climate change may range from discomfort, inconvenience, economic loss caused by interruption of services, property damage, threats to health, to injury and death," the report found. It recommended

urgent national action to ensure infrastructure was better prepared to survive climate change. Federal Climate Change Minister Penny Wong, who launched the report, said global warming could have a major impact on infrastructure and more study was needed. "With more extreme weather events resulting from climate change, the potential impact on our buildings is a significant concern,"

## **GLOBAL WARMING MAY HASTEN CARBON RELEASE FROM WORLD'S PEAT BOGS**

7 November, 2008 By ANI Science News

<http://www.freshnews.in/global-warming-may-hasten-carbon-release-from-world's-peat-bogs-96663>

A new analysis has determined that billions of tons of carbon sequestered in the world's peat bogs could be released into the atmosphere in the coming decades as a result of global warming. The analysis of the interplay between peat bogs, water tables, and climate change, was done by scientists at Harvard University, Worcester State College, and the Japan Agency for Marine-Earth Science and Technology. Typically found at northerly latitudes, peat bogs are swampy areas whose cold, wet environment preserves organic matter, preventing it from decaying. This new work shows how peat bogs' stability could be upset by the warming of the earth, which has disproportionately affected the higher latitudes where the bogs are generally found.

According to the scientists, an atmospheric release of even a small percentage of the carbon locked away in the world's peat bogs would dwarf emissions of manmade carbon. "Our modeling suggests that higher temperatures could cause water tables to drop substantially, causing more peat to dry and decompose," said Paul R. Moorcroft, professor of organismic and evolutionary biology in Harvard's Faculty of Arts and Sciences. "Over several centuries, some 40 percent of carbon could be lost from shallow peat bogs, while the losses could total as much as 86 percent in deep bogs," he added.

Each square meter of a peat bog contains anywhere from a few to many hundreds of kilograms of un decomposed organic matter, for a total of 200 to 450 billion metric tons of carbon sequestered in peat bogs worldwide. This figure is equivalent to up to 65 years' worth of the world's current carbon emissions from fossil fuel burning. "Peat bogs contain vast stores of carbon," Moorcroft said. "They will likely respond to the expected warming in this century by losing large amounts of carbon during dry periods," he added. Moorcroft and his colleagues simulated the responses of two peat bogs in northern Manitoba to temperature increases of 4 degrees Celsius, or 7.2 degrees Fahrenheit, a gain that is at the conservative end of estimates for the next 100 years. Their modeling looked specifically at water table dynamics, since peat bogs' stability is grounded in their cold, waterlogged nature.

"Previous modeling has assumed that decomposition in peat bogs is like that in a conventional soil," Moorcroft said. "Ours is the first simulation to take a realistic look at the interaction between the dynamics of the water table, peat temperatures, and peat accumulation,"

## **GLOBAL WARMING IS CHANGING ORGANIC MATTER IN SOIL : ATMOSPHERE COULD CHANGE AS A RESULT**

24 November, 2008 Science Daily

<http://www.sciencedaily.com/releases/2008/11/081124130948.htm>

New research shows that we should be looking to the ground, not the sky, to see where climate change could have its most perilous impact on life on Earth. Scientists at the University of Toronto Scarborough have published research findings in the journal *Nature Geoscience* that show global warming actually changes the molecular structure of organic matter in soil. "Soil contains more than twice the amount of carbon than does the atmosphere, yet, until now, scientists haven't examined this significant carbon pool closely," says Myrna J. Simpson, principal investigator and Associate Professor of Environmental Chemistry at UTSC. "Through our research, we've sought to determine what soils are made up of at the molecular level and whether this composition will change in a warmer world."

Soil organic matter is what makes dirt fertile and able to support plant life both of which are especially important for agriculture. Organic matter retains water in the soil and prevents erosion. Natural processes of decomposition of soil organic matter provide plants and microbes with the energy source and water they need to grow, and carbon is released into the atmosphere as a by-product of this process. Warming temperatures are expected to speed up this process which will increase the amount of CO<sub>2</sub> that is transferred to the atmosphere.

"From the perspective of agriculture, we can't afford to lose carbon from the soil because it will change soil fertility and enhance erosion" says Simpson. "Alternatively, consider all the carbon locked up in permafrost in the Arctic. We also need to understand what will happen to the stored carbon when microbes become more active under warmer temperatures." Until Simpson's research, scientists didn't know much about soil's molecular composition. Part of the reason is that, from a chemical perspective, soil is difficult to analyze due to its many components, including bacteria, fungi and partially degraded, or old plant material. Simpson's team, which includes research collaborators Professors Dudley Williams and Andre Simpson, is uniquely positioned to address this new frontier. The team uses a NMR (Nuclear Magnetic Resonance) facility the only NMR facility in Canada specifically dedicated to environmental research to gain a detailed view of soil's molecular structure and reactivity. In their current study, Simpson's team used an outdoor field experiment in the valley behind the UTSC campus to ensure natural ecosystem processes were preserved. Electrodes warmed the test soil between three and six degrees through winter and summer seasons, over a 14-month period. Throughout the test period, the team analyzed the molecular composition of soil samples.

## **GLOBAL WARMING PREDCTIONS ARE OVERESTIMATED, SUGGESTS STUDY ON BLACK CARBON**

25 November, 2008 Science Daily

<http://www.sciencedaily.com/releases/2008/11/081119120155.htm>

A detailed analysis of black carbon- the residue of burned organic matter - in computer climate models suggests that those models may be overestimating global warming predictions. A new Cornell study, published online in *Nature Geosciences*, quantified the amount of black carbon

in Australian soils and found that there was far more than expected, said Johannes Lehmann, the paper's lead author and a Cornell professor of biogeochemistry. The survey was the largest of black carbon ever published.

As a result of global warming, soils are expected to release more carbon dioxide, the major greenhouse gas, into the atmosphere, which, in turn, creates more warming. Climate models try to incorporate these increases of carbon dioxide from soils as the planet warms, but results vary greatly when realistic estimates of black carbon in soils are included in the predictions, the study found. Soils include many forms of carbon, including organic carbon from leaf litter and vegetation and black carbon from the burning of organic matter. It takes a few years for organic carbon to decompose, as microbes eat it and convert it to carbon dioxide. But black carbon can take 1,000-2,000 years, on average, to convert to carbon dioxide. By entering realistic estimates of stocks of black carbon in soil from two Australian savannas into a computer model that calculates carbon dioxide release from soil, the researchers found that carbon dioxide emissions from soils were reduced by about 20 percent over 100 years, as compared with simulations that did not take black carbon's long shelf life into account.

The findings are significant because soils are by far the world's largest source of carbon dioxide, producing 10 times more carbon dioxide each year than all the carbon dioxide emissions from human activities combined. Small changes in how carbon emissions from soils are estimated, therefore, can have a large impact. "We know from measurements that climate change today is worse than people have predicted," said Lehmann. "But this particular aspect, black carbon's stability in soil, if incorporated in climate models, would actually decrease climate predictions."

The study quantified the amount of black carbon in 452 Australian soils across two savannas. Black carbon content varied widely, between zero and more than 80 percent, in soils across Australia. "It's a mistake to look at soil as one blob of carbon," said Lehmann. "Rather, it has different chemical components with different characteristics. In this way, soil will interact differently to warming based on what's in it."

## **INDIA CALLS FOR ACTION ON BALI PLAN: VOICES CONCERN OVER CHANGES IN UN CONVENTION ON CLIMATE CHANGE**

Akshaya Mukul,  
14 December, 2008 Times of India, New Delhi

Poznan: India does not want to let the global community alter or reinterpret the UN convention on climate change at the cost of distracting attention from the earlier consensus. This was conveyed by the Indian delegation at the ministerial –level meeting of more than 100 countries at Poland on 12<sup>th</sup> December. The delegation was emphatic that there was no reason to stray beyond the “four pillars of Bali Action Plan”. The Bali Action Plan, decided upon in the UN meet on climate in December last year, demanded that the countries work on green house gas (GHG) mitigation and adaptation to climate change and find the finances and technology to do so without altering the existing UN Framework Convention on Climate Change.

“All human beings must have equal rights to the global atmospheric resources with accounting for historical responsibilities,” Vijai Sharma, environment secretary and leader of the Indian delegation, told the high level segment. While highlighting that the developing world was facing the brunt of climate change for which the developed world was principally responsible, Sharma said financial crisis should not become an excuse to postpone action for another day.

“The recent financial crisis has shown, and this has not escaped any body, that huge resources can be mobilized in developed countries when there is a will. And this should spur action on R&D in clean technologies. We welcome ideas for the investments proposed in renewable energy, and India will be a willing participant”, he said, adding that government-led action in technology and finance was key to combating climate change. Pointing out how emissions of developed countries had been rising contrary to the provision, Sharma said per capita emissions of developed countries must also reduce, which would involve shifts from current unsustainable lifestyles. In the field of technology-transfer, Sharma said there should be wide dissemination of existing clean technologies.

## ICFRE NEWS

### ONE WEEK REFRESHER TRAINING COURSE FOR IFS OFFICERS AT ICFRE DEHRADUN

A one week refresher training course for Indian Forest Service officers on “Climate Change and Relevance to Forestry Sector” was organized by the Biodiversity and Climate Change Division at ICFRE, Dehradun from 3<sup>d</sup> to 7<sup>th</sup> November 2008. 25 IFS officers of different states participated in this course, sponsored by the Ministry of Environment and Forests, Government of India, New Delhi. The programme was highly appreciated and rated by the participants.



### PARTICIPATION OF ICFRE DELEGATION IN THE FOURTEENTH CONFERENCE OF THE PARTIES TO THE UNFCCC AND FOURTH MEETING OF THE PARTIES TO THE KYOTO PROTOCOL HELD IN POZNAN, POLAND FROM 1-12 DECEMBER 2008.

The ICFRE delegation, comprising Shri Jagdish Kishwan, DG, ICFRE, Dr Renu Singh, Head, Biodiversity and Climate Change Division, Shri V.R.S. Rawat, Scientist- D, Biodiversity and Climate Change Division, and Dr A. Ramachandran, Director, Centre for Climate Change and Adaptation Research, Anna University Chennai, Tamilnadu participated in the conference along with the Government of India Delegation.

The ICFRE personnel were involved in the negotiations on the following agenda items of the SBSTA and AWG-KP related to forestry during the conference:

1. SBSTA 29 Agenda item 5: Reducing Emissions from Deforestation in Developing Countries (REDD): Approaches to stimulate action
2. AWG –KP 6 Agenda item 3 (b) Land Use, Land Use Change and Forestry (LULUCF)

India in its statement supported a comprehensive approach on REDD that encompasses all actions by country Parties contributing directly in reducing emissions from deforestation at the global level.



## UPCOMING EVENTS

### CLIMATE CHANGE AND URBAN POVERTY – INFRASTRUCTURES OF DEVELOPMENT

28 January 2009 Dhaka, Bangladesh      *Contact name:* Shahana Siddiqui  
<http://www.bwpi.manchester.ac.uk/events/conferences/index.html>

This one-day Conference is convened by the BRAC Development Initiative, the Brooks World Poverty Institute and partners and will be held in Dhaka, Bangladesh on 28 January 2009. Organized by: BRAC Development Institute; Brooks World Poverty Institute  
Deadline for abstracts/proposals: 15 November 2008

### GREENHOUSE 2009

23 to 26 March 2009 Perth, WA, Australia

<http://www.greenhouse2009.com>

CSIRO, in conjunction with the Australian Climate Change Science Program, is proud to announce GREENHOUSE 2009: Climate Change and Resources.

### CLIMATE CHANGE: GLOBAL RISKS, CHALLENGES AND DECISIONS

11-14 November, 2008 abstracts/proposals: 10 to 12 March 2009 Copenhagen, Denmark

Cocontact name: Marie Ekström <http://climatecongress.ku.dk>

An international scientific conference organized by IARU as part of the official preparation for the UN Climate Change Summit (COP 15) to be held in Copenhagen in 2009.

### 8<sup>TH</sup> INTERNATIONAL NCCR CLIMATE SUMMER SCHOOL 2009

30 July to 4 August, 2009

Grindelwald, Switzerland      *Contact name:* NCCR Climate Management Centre  
[http://www.nccr-climate.unibe.ch/summer\\_school/2009/](http://www.nccr-climate.unibe.ch/summer_school/2009/)

The NCCR Climate, Switzerland's Centre of Excellence in Climate and Climate Impact Research, invites young scientists to join leading climate researchers in a scenic Swiss Alpine setting for keynote lectures, workshops and poster sessions

Organized by: NCCR Climate

Deadline for abstracts/proposals: 20 November 2008.

### CCGW 2009 –INTERNATIONAL CONFERENCE ON CLIMATE CHANGE AND GLOBAL WARMING

23 September, 2009 Vancouver, Other

<http://www.waset.org/wcset09/vancouver/ccgw/> CCGW 2009 :

International Conference on Climate Change and Global Warming organized by: World Academy of Science, Engineering and Technology

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