

Environment News Futures

New Species of 'See-through' Frog Discovered

PTI—May 28, 2017

Washington: A new glass frog species with transparent skin through which its beating heart is visible has been discovered by scientists who warn that the amphibian may already be at threat of extinction.

The frog (*Hyalinobatrachium yaku*), discovered in the Amazonian lowlands of Ecuador has unique physical and behavioural traits. The dark green spots on its back and its reproductive behaviour mark it out as different from known frogs.

“Males guard the eggs, which are attached below a tree’s leaves, until they hatch and fall on the below water stream,” said Juan Guayasamin, of the Universidad San Francisco de Quito in Ecuador. “Not all glass frogs have hearts that are visible through the chest. In some, the heart itself is white, so you don’t see the red blood,” said Paul Hamilton, of US-based organisation Biodiversity Group.

“Amphibians are the most threatened vertebrate class on the planet,” Ariadne Angulo of the amphibian specialist group at the International Union for Conservation of Nature, was quoted as saying by ‘New Scientist’.

What Happens to Earth if US Exits Climate Deal?

AP—May 27, 2017

Washington: Earth is likely to hit more dangerous levels of warming even sooner if the US pulls back from its pledge to cut carbon dioxide pollution, scientists said. That’s because America contributes so much to rising temperatures.

US President Donald Trump will soon decide whether the United States stays in or leaves a 2015 Paris climate change accord in which nearly every nation agreed to curb its greenhouse gas emissions. Other global leaders have been urging him to stay during high level security and economic meetings in Italy that began Friday. Pope Francis already made the case with a gift of his papal encyclical on the environment when Trump visited the Vatican earlier this week.

In an attempt to understand what could happen to the planet if the US pulls out of Paris, The Associated Press consulted with more than two dozen climate scientists and analyzed a special computer model scenario designed to calculate potential effects. Scientists said it would worsen an already bad problem, and make it far more difficult to prevent crossing a dangerous global temperature threshold.

Calculations suggest it could result in emissions of up to 3 billion tons of additional carbon dioxide in the air a year. When it adds up year after year, scientists said that is enough to melt ice

sheets faster, raise seas higher and trigger more extreme weather. “If we lag, the noose tightens,” said Princeton University climate scientist Michael Oppenheimer, co-editor of the peer-reviewed journal *Climatic Change*.

‘Heat Island’ Effect could Double Climate Change Costs for World’s Cities

University of Sussex—May 29, 2017

Overheated cities face climate change costs at least twice as big as the rest of the world because of the ‘urban heat island’ effect, new research shows. The study by an international team of economists of all the world’s major cities is the first to quantify the potentially devastating combined impact of global and local climate change on urban economies.

The analysis of 1,692 cities, published in the journal *Nature Climate Change*, shows that the total economic costs of climate change for cities this century could be 2.6 times higher when heat island effects are taken into account than when they are not. For the worst-off city, losses could reach 10.9 per cent of GDP by the end of the century, compared with a global average of 5.6 per cent.

The urban heat island occurs when natural surfaces, such as vegetation and water, are replaced by heat-trapping concrete and asphalt, and is exacerbated by heat from cars, air conditioners and so on. This effect is expected to add a further two degrees to global warming estimates for the most populated cities by 2050. Higher temperatures damage the economy in a number of ways -- more energy is used for cooling, air is more polluted, water quality decreases and workers are less productive, to name a few.

The authors—from the University of Sussex in the UK, Universidad Nacional Autónoma de México and Vrije University Amsterdam -- say their new research is significant because so much emphasis is placed on tackling global climate change, while they show that local interventions are as, if not more, important. Professor Richard S.J. Tol Mae, Professor of Economics at the University of Sussex, said: “Any hard-won victories over climate change on a global scale could be wiped out by the effects of uncontrolled urban heat islands. “We show that city-level adaptation strategies to limit local warming have important economic net benefits for almost all cities around the world.”

Although cities cover only around one per cent of Earth’s surface, they produce about 80 per cent of Gross World Product, consume about 78 per cent of the world’s energy and are home to over half of the world’s population. Measures that could limit the high economic and health costs of rising urban temperatures are therefore a major priority for policy makers.

The research team carried out a cost-benefit analysis of different local policies for combating the urban heat island, such as cool pavements—designed to reflect more sunlight and absorb less heat—cool and green roofs and expanding vegetation in cities. The cheapest measure, according to this modelling, is a moderate-scale installation of cool pavements and roofs. Changing 20 per cent of a city’s roofs and half of its pavements to ‘cool’ forms could save up to 12 times what they cost to install and maintain, and reduce air temperatures by about 0.8 degrees.

Doing this on a larger scale would produce even bigger benefits but the vastly increased costs mean that the cost-benefit ratio is smaller. The research has important implications for future climate policy decisions—the positive impacts of such local interventions are amplified when global efforts are also having an effect, the study shows. Professor Tol said: “It is clear that we have until now

underestimated the dramatic impact that local policies could make in reducing urban warming.

“However, this doesn’t have to be an either/or scenario. In fact, the largest benefits for reducing the impacts of climate change are attained when both global and local measures are implemented together. And even when global efforts fail, we show that local policies can still have a positive impact, making them at least a useful insurance for bad climate outcomes on the international stage.”

Hotspots Show that Vegetation Alters Climate by up to 30 percent

Engineers find strong feedbacks between the atmosphere and vegetation that explain up to 30% of precipitation and surface radiation variance; study reveals large potential for improving seasonal weather predictions

Columbia University School of Engineering and Applied Science—May 29, 2017

A new Columbia Engineering study, led by Pierre Gentine, associate professor of earth and environmental engineering, analyzes global satellite observations and shows that vegetation alters climate and weather patterns by as much as 30 percent. Using a new approach, the researchers found that feedbacks between the atmosphere and vegetation (terrestrial biosphere) can be quite strong, explaining up to 30 percent of variability in precipitation and surface radiation. The paper (DOI 10.1038/ngeo2957), published May 29 in *Nature Geoscience*, is the first to look at biosphere-atmosphere interactions using purely observational data and could greatly improve weather and climate predictions critical to crop management, food security, water supplies, droughts, and heat waves.

“While we can currently make fairly reliable weather predictions, as, for example, five-day forecasts, we do not have good predictive power on sub-seasonal to seasonal time scale, which is essential for food security,” Gentine says. “By more accurately observing and modeling the feedbacks between photosynthesis and the atmosphere, as we did in our paper, we should be able to improve climate forecasts on longer timescales.”

Vegetation can affect climate and weather patterns due to the release of water vapour during photosynthesis. The release of vapour into the air alters the surface energy fluxes and leads to potential cloud formation. Clouds alter the amount of sunlight, or radiation, that can reach Earth, affecting Earth’s energy balance, and in some areas can lead to precipitation. “But, until our study, researchers have not been able to exactly quantify in observations how much photosynthesis, and the biosphere more generally, can affect weather and climate,” says Julia Green, Gentine’s PhD student and the paper’s lead author.

Recent advancements in satellite observations of solar-induced fluorescence, a proxy for photosynthesis, enabled the team to infer vegetation activity. They used remote sensing data for precipitation, radiation, and temperature to represent the atmosphere. They then applied a statistical technique to understand the cause and feedback loop between the biosphere and the atmosphere. Theirs is the first study investigating land-atmosphere interactions to determine both the strength of the predictive mechanism between variables and the time scale over which these links occur.

The Birth and Death of a Tectonic Plate

University of California - Santa Barbara—May 24, 2017

A new technique to investigate the underwater volcanoes that produce Earth's tectonic plates has been developed by a geophysicist.

Several hundred miles off the Pacific Northwest coast, a small tectonic plate called the Juan de Fuca is slowly sliding under the North American continent. This subduction has created a collision zone with the potential to generate huge earthquakes and accompanying tsunamis, which happen when faulted rock abruptly shoves the ocean out of its way. In fact, this region represents the single greatest geophysical hazard to the continental United States.

Atlas of the Human Planet 2017: How Exposed are We to Natural Hazards?

European Commission, Joint Research Centre (JRC)—May 24, 2017

One out of three people in the world is exposed to earthquakes, a number which almost doubled in the past 40 years. Around 1 billion in 155 countries are exposed to floods and 414 million live near one of the 220 most dangerous volcanoes. The 2017 edition of the Atlas of the Human Planet, by the European Commission's Joint Research Centre, looks at the exposure of people and built-up areas to the six major natural hazards, and its evolution over the last 40 years. The atlas will be presented during the 2017 Global Platform for Disaster Risk Reduction meeting in Cancun, Mexico.

Human-induced Deforestation is Causing an Increase in Malaria Cases

Lehigh University—May 23, 2017

Nearly 130 million hectares of forest -- an area almost equivalent in size to South Africa—have been lost since 1990, according to a recent report by the Food and Agriculture Organization of the United Nations.

A new study of 67 less-developed, malaria-endemic nations titled, "Anthropogenic forest loss and malaria prevalence: a comparative examination of the causes and disease consequences of deforestation in developing nations," published in *AIMS Environmental Science*, led by Lehigh University sociologist Dr. Kelly Austin, finds a link between deforestation and increasing malaria rates across developing nations.

Malaria represents an infectious disease tied to environmental conditions, as mosquitoes represent the disease vector. Deforestation, Austin notes, is not a natural phenomenon, but rather results predominantly from human activities, or anthropogenically.

China to Levy Environment Tax to Fight Pollution

PTI—December 26, 2016

Beijing: Carbon dioxide, one of the major contributors to global warming, however, is not included in the levying list.

Battling recurring pollution enveloping its cities, China has passed a new law to levy environment tax on polluters, specially on heavy industries. The Environment Tax Law was adopted by the legislature, the National People's Congress (NPC) Standing Committee which concluded its meeting here on Sunday.