

Contact: Rob Riordan, NatureServe / 703-908-1831
e-mail: rob_riordan@natureserve.org

January 12, 2006

EMBARGOED until 1800h (6 p.m.) London time (1 p.m. EST), Wed. Jan. 11

Global Warming is Driving Widespread Amphibian Extinctions by Triggering Epidemic Disease New Study in *Nature* Documents the Climate-Disease Link

Arlington, Virginia — A new study published today in the journal *Nature* provides the first clear proof that global warming is causing the outbreaks of infectious disease that are wiping out entire frog populations, driving many species to extinction.

The study reveals precisely how the warming may alter the dynamics of a fatal disease of amphibians caused by a fungus that grows on their skin. Because of this climate-driven “chytrid” disease, hundreds of species around the world are near extinction or have already disappeared.

“Disease is the bullet killing frogs, but climate change is pulling the trigger,” said J. Alan Pounds, the study’s lead author and Resident Scientist at the Monteverde Cloud Forest Preserve in Costa Rica. “Global warming is wreaking havoc on amphibians, and will cause staggering losses of biodiversity if we don’t do something fast.”

The decline of amphibians in apparently pristine, protected habitats in Costa Rica and elsewhere has perplexed conservation biologists since 1990, when the problem was first recognized. At least 110 species of brightly colored harlequin frogs once lived near streams in the tropics of Central and South America, but about two-thirds of them vanished in the 1980s and 1990s. In the famed cloud forests of Costa Rica, for example, the Monteverde harlequin frog disappeared in the late 1980s, as did the golden toad, whose much-publicized extinction, said Pounds, “was the first sign of this emerging threat to species survival.”

Although Pounds had proposed a climate-disease link earlier, the new study provides compelling evidence for it, and a theory of how it works. Using records of sea surface and air temperatures, the authors show that harlequin frog species are disappearing in near lockstep with the changing climate. According to Pounds and colleagues, the Earth’s rising temperatures enhance cloud cover over tropical mountains, leading to cooler days and warmer nights, both of which favor the chytrid fungus, which grows and reproduces best at temperatures between 17 and 25 °C (63 to 77 °F).

– MORE –

This frog-decline theory leaps over a major roadblock to our understanding, which the authors call the “climate-chytrid paradox”. The chytrid fungus kills frogs mostly in cool highlands or during winter, implying that low temperatures make it more deadly. So the idea that it flourishes in warm years, which the evidence now supports, seems to fly in the face of reason. A clue to the puzzle’s solution is that frogs are disappearing fastest at middle elevations. This implies that temperature extremes, both high and low, can hold back the killer, and that forces moderating them—daytime cooling and nighttime warming—can unleash it.

These discoveries are the fruit of interdisciplinary teamwork facilitated by the Tropical Science Center, the non-profit scientific and educational organization that operates the Monteverde Cloud Forest Preserve, and RANA, the Research and Analysis Network for Neotropical Amphibians. Scientists from nine Latin American countries collaborating through RANA developed the new database of harlequin frog observations used in the study. Funded by the National Science Foundation and coordinated by NatureServe, RANA promotes research on amphibian declines by bridging international barriers to scientific collaboration.

The study comes at a time of growing concern about the future of amphibians. The Global Amphibian Assessment, published in 2004, found that nearly one-third of the world’s 6,000 or so species of frogs, toads, and salamanders are threatened with extinction—a figure that is far greater than that for any other group of animals. “The good news, such as it is, is that the new findings will open up avenues of research that could provide conservationists with the means to save the amphibians that still survive,” said Bruce Young, a zoologist with NatureServe who took part in the study. “If this cloud has any silver lining, that’s it.”

But the broad implications go beyond amphibians: global warming and the accompanying emergence of infectious diseases are a real and immediate threat to biodiversity, and a growing challenge for humankind. Reducing concentrations of greenhouse gases—and reducing them soon—could limit the warming and hence the number of extinctions. “There is clearly an urgent need for a rapid transition to cleaner energy sources,” said J. Alan Pounds. “I reiterate the call for a bold initiative, on the order of the Manhattan and Apollo projects, to put an end to humanity’s dependence on fossil fuels.”

###

NatureServe is a non-profit conservation group dedicated to providing the scientific information, technology, and services needed to guide effective conservation action. Representing a network of 75 natural heritage programs and conservation data centers in the United States, Canada, and Latin America, NatureServe is a leading source for detailed scientific information about threatened plants, animals, and ecosystems. Visit us online at www.natureserve.org.