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Berkeley Lab Scientist Sees Risk to Insurance Industry From Climate Change

BERKELEY, Calif., Aug. 11 (AScribe Newswire) -- The insured share of the world's total economic losses from weather-related catastrophes is rising, increasing from a negligible fraction in the 1950s to 25 percent in the last decade, says a scientist at the U.S. Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab). The ratio has climbed more quickly in the United States, with more than 40-percent of the total losses insured in the 1990s.

In an invited "Viewpoint" article published in the August 12, 2005 issue of the journal Science, Evan Mills, a scientist in Berkeley Lab's Environmental Energy Technologies Division who has worked on the issue for a decade, reviews the evidence that the global insurance industry is paying out more in claims caused by extreme weather-related natural disasters. Since climate change could lead to an increase in large-scale and localized extreme weather events, some insurance companies have called for a better understanding of the risks to their business and to society from climate change. Mills' article, entitled "Insurance in a Climate of Change," is part of a special issue of Science on disasters.

In response to industry concerns, Mills studied insurance claims costs from weather-related and other types of catastrophes. In his Science paper, he notes that the weather-dependent share of global insured losses (about 90- percent) is even greater than that experienced by the world economy as a whole (about 75-percent).

"Global weather-related losses in recent years have been trending upward much faster than population, inflation, or insurance penetration, and faster than non-weather-related events," Mills writes. "Specific event types have increased far ore quickly than the averages. For example, damages from U.S. storms grew 60-fold to $6 billion a year between the 1950s and the 1990s. As the climate changes, populations are moving more into harm's way, but demographic factors do not appear to explain all of the increase."

According to Mills, insurance is the world's largest industry, and would be the third largest country if its $3.2 trillion in yearly revenues were compared with national GDPs.

Given the increase in the number, cost, and variability of catastrophic losses, some insurers, re-insurers, and their trade associations now view climate change as a "strategic factor" in charting their future, Mills says. Particularly vulnerable are the emerging insurance markets in the developing world. Insurers see this as the future of their industry (already with $400 billion a year in premiums and growing several times faster than mature markets), yet these regions are also particularly unprepared for and vulnerable to climate change.

Insurers from wealthy countries share these risks as they take ownership in insurance companies domiciled in the developing world. Weather-related damage can come from such disasters as flooding, droughts, mudslides and wildfires. Storm surges cause coastal

damage, and lightning strikes start fires and damage electronic equipment. Gradual climate changes and abrupt weather disasters cause property, agricultural and industrial losses, as well as risks to life and health.

In his research, Mills found that 60-percent of total weather-related losses are attributable to small events as distinct from headline-catching catastrophes. The industry is vulnerable to weather catastrophes in many ways, property damage is only the most obvious, Mills says. There are also business and supply-chain disruptions, loss of utility service, equipment breakdown arising from extreme temperature events, and data loss from power surges or outages. Extreme weather events can breach pollution containment, leaving industries open to liability, and power outages disrupt manufacturing and services.

Mills found that from 1980 through 2004, the global economic costs of weather-related events totaled $1.4 trillion (inflation-corrected), of which $340 billion was insured.

"To put the burden of these costs on insurers in perspective, recent average annual losses surpass those experienced in the aftermath of the 9/11 attacks in the United States," he notes.

According to Mills, these numbers are probably underestimates for a number of reasons. For one, damages from small events are rarely captured in such statistics. One claim service that aggregates statistics for U.S. insurers only captures those events with costs above a threshold of $25 million. Observed losses would have grown even faster in the absence of disaster preparedness and recovery efforts.

The availability of insurance helps economies grow and develop by mitigating risk. But if the nature, scale or location of hazards changes, they pose a threat to the insurance system, if insurers are unprepared for the scale of what can be perceived as "inconceivable" disasters, Mills says.

Now there is the risk that weather-related claims will increase as the climate changes. Among the reasons for this: storms could increase in frequency or intensity, several kinds of damage could result from a single event (for example, simultaneous wind, flooding and storm surge-related damage), and shifts in the spatial distribution of events could expose more property and population to damaging events. The diversity and potential magnitude of health-related impacts of climate change are only now being appreciated. Of particular concern are a host of respiratory diseases arising from increased pollens, molds, and particulates mobilized by climate change. Actuarial uncertainty can lead to rising insurance prices, reduced coverages and, ultimately, to the uninsurability of certain hazards.

As a result, in some cases, insurance premiums might not be enough to pay for claims. In a bad year, weather-related claims, plus unrelated claims from earthquakes or terrorist incidents, together with uncorrelated declines in financial markets (where insurers hold their loss reserves) could form the kind of "perfect storm" that drives some insurance companies to the edge of solvency. In this event, the burden shifts to governments and individuals, neither of which wish to assume the losses.

"The good news is that the insurance industry has played a valuable historical role in loss prevention," says Mills. "Insurance companies were founders of the first fire departments, building codes, and auto safety testing protocols. But the role they will play in climate change mitigation and adaptation remains to be seen."

Mills' Science article documents innovative steps being taken by some insurers. Recognizing that insurance is a tool that helps society adjust to change, risk and economic loss, Mills believes thatinsurers have a significant opportunity to become more engaged

with the science of predicting the potential impacts of climate change, for example, by coupling their existing "catastrophe models" with climate models.

"It's important that insurers, their regulators, and the policy community develop a better grasp of the physical and business risks from climate change," Mills says. "The most effective solutions will require public-private partnerships."

Berkeley Lab is a U.S. Department of Energy national laboratory located in Berkeley, California. It conducts unclassified scientific research and is managed by the University of California. Visit our website at http://www.lbl.gov.

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An html version of this release with images and links to additional information is available at http://www.lbl.gov/Science-Articles/Archive/EETD-climate-change-risk.html

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