



A Global Forum

Home :: takefive :: Initiatives :: News :: Reports :: Resources :: Link/RSS ::
Contact :: About

**Evan Mills, Ph.D.**

Staff Scientist, Energy Analysis Department
Lawrence Berkeley National Laboratory
Berkeley, California 94720 USA
Website: <http://insurance.lbl.gov>

Posted Feb. 2, 2007

Takefive:

Dr. Mills, you have said that climate change/global warming represents a "watershed" moment for the insurance industry. Can you briefly describe what you mean by that statement?

Dr. Mills:

This is clearly one of those major emerging risks that comes along from time to time and challenges the industry. In the past it's been massive droughts of the 1930s, riots of the 1960s, and earthquakes in the 1990s, and terrorism at the start of this decade. There are several ways in which human-induced climate change and global warming presents a sort of fork in the road for insurers.

First, the problem is characterized in part by the very nature of climate change (i.e. a departure from past trends). This is always a challenge for underwriting. The rising number and declining predictability of extreme weather events, coupled with rising incidence of linked losses previously believed to be uncorrelated, presents a real conundrum for actuaries.

To put these losses in perspective, it is sobering to note that the average annual insured losses from weather-related catastrophes globally exceed that of the 9/11 attacks, and yet they receive only a fraction of the attention. I'm told by Tim Wagner, Nebraska's insurance director, that loss-ratios are higher Nebraska due to hailstorms than those in New York following 9/11.

If we are concerned about terrorism, shouldn't we be equally concerned about extreme weather, global warming and climate change? It's notable that the U.S. Department of Homeland Security views the risks of hurricanes and terrorism as similar.

Second, most agree that climate change will have its worst impacts in the developing world, which is precisely where the global insurance industry's future lies. Premiums hit \$426 billion in 2005, and are growing several times faster than in the saturated markets in the industrialized world. Many U.S. insurers are already actively doing business in those regions, which means that their surplus has become exposed to extreme weather events occurring far beyond our borders. So, insurers will be faced with a particular challenge there, and will have to opt for some combination of foregoing the market and rolling up their sleeves and understanding and managing the risks. I think that climate change stands to adversely impact the growth of the industry, and result in localized insolvencies, if a business-as-usual stance is maintained.

Third, consumers and governments are already watching insurers very closely on this. They want to see a proactive response and to have insurers affirm that they are not just fair-weather friends. Whatever one might believe about climate change, it is safe to say that insurers face reputational risk with respect to how they handle this issue. Stock insurers will also be held accountable by their shareholders.

Fourth, the threat to insurability itself, as manifested by the already apparent crisis of insurance availability and affordability today in the United States. A shift to publicly funded insurers of last resort will be appropriate in some cases, but should indeed be a measure of very last resort. It is highly preferable to find market-based solutions rather than allowing markets to fail and plugging the proverbial dike with potentially inferior government solutions.

Lastly, the specter of climate change presents a variety of new opportunities for insurers to craft new products or profit centers in the core business and to make gains in asset management by playing in the burgeoning and potentially very lucrative "clean tech" market.

Takefive:

You have previously mentioned that climate change could also result in liability-related insurance losses. How do you see this unfolding?

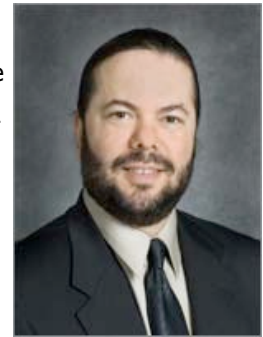
Dr. Mills:

While the most widely discussed insurance-related consequences of climate change involve property damages from extreme weather events, there is increasing awareness of the more subtle but equally material dimension of liability. Even for those who believe that the physical impacts of climate change may not cause observable insurance losses for some time, it is clear that liability-related claims are already being made. Legal triggers include nuisance, negligence, breach of statutory duty, and breach of human rights.

The relevant categories of insured liability include:

Bio**Evan Mills, Ph.D.**

Dr. Evan Mills is a staff scientist at the U.S. Department of Energy's Lawrence Berkeley National Laboratory, Berkeley, Calif.



For the past decade, Dr. Mills has studied in depth the question of the impacts of climate change on the insurance industry, both in the United States and abroad, publishing more than 50 reports, including serving as a convening lead author for the [Intergovernmental Panel on Climate Change \(IPCC\) Third Assessment Report](#), under the auspices of the United Nations, and is contributing to the Fourth Assessment released in February 2007.

Dr. Mills received his Masters of Science degree from the Energy and Resources Group at the University of California at Berkeley and his Ph.D. from the Department of Environmental and Energy Systems Studies at the University of Lund in Sweden. In Sweden, Dr. Mills worked for several years with the Swedish State Power Board and the Swedish National Board for Industrial and Technical Development on energy planning projects.

Related Links

[The Role of NAIC in Responding to Climate Change \(December 2006\)](#)

[Directory of Insurer Activities on](#)

- Environmental liability for emitters of greenhouse-gases;
- Environmental liability associated with toxic releases, mold, and other consequences of the physical impacts of climate change (e.g. releases following hurricanes);
- Public nuisance claims resulting from air pollution – liability for an unreasonable injury to a right common to the general public that causes harm to life, health or property;
- Product liability associated with materials or products that contribute to the greenhouse effect;
- Sarbanes-Oxley related liabilities for corporate officers (including insurers) involved as emitters or arising from obligations to safeguard shareholder value from the consequences of climate change;
- Business interruptions as triggers of liability claims against providers of utility services;
- Fraud-related claims triggered by sources of misinformation on climate change; and
- Political risk claims triggered by new government policies and the like.

Takefive:

You argue that media attention often focuses on large catastrophic events (e.g., Hurricanes Katrina and Rita), but these events represent only a portion of total weather-related insurer losses. You then go on to suggest that the floor for data compiled by the Property Claims Service (PCS) should be lowered from its current threshold of \$25 million. Can you elaborate on this argument?

Dr. Mills:

By Munich Re's accounting, about 40 percent of all weather-related P/C losses are from the really large events. The rest are the combined result of the relatively small and diffuse events, including: drought, hail, heat waves, ice storms, lightning, sea-level rise, thunderstorms, tornados, torrential rains, wildfire, winter storms and the like. Hurricanes do play a larger role in U.S. losses than many other parts of the world, but, according to Am Re, even here at least 35 percent of the \$150 billion insured weather-related catastrophe losses over the past half-century were from other types of events. To this total one would have to add additional losses not classified as catastrophes.

These "smaller" events cause a myriad of physical impacts that may or may not slip through the PCS filter, including: blackouts, coastal erosion, crop/fishery damages, equipment breakdown, eroded air quality, eroded water quality, flooding, mudslides, property loss, sinkholes/subsidence, weather-related vehicle accidents. Some of these events are now moving into the category of CATS. Risk Management Solutions (RMS) wrote an interesting paper on this, with scenarios of CAT-scale wildfires, blackouts, etc. Most climate scientists expect virtually all of these kinds of events to become more common and/or more intense under climate change.

I sympathize with the effort it takes to even collect events with losses above \$25 million, but there are untold billions of dollars each year in losses below that threshold and, indeed, the type and structure of those may have an entirely different insurance profile than the events that are presently counted. So, the industry is flying partly blind and I don't think that's wise in the long run. I'll give you a couple of examples. Not a single winter storm was captured by the PCS data between 1949 and 1974, yet we know today that winter storms in the United States amount for about \$3 billion/year in combined losses – that's like a significant hurricane. Another item is lightning, which probably also causes several billion per year in losses, yet those events rarely if ever make it into the PCS data.

Keep in mind that we are talking here about P/C, which represents only about half of the entire industry's premium volumes. There are real life/health implications for climate change as well, and the data on weather-related insured losses in those lines is sparse at best. We recently completed a major three-year study, "[Climate Change Futures](#)," which was funded by Swiss Re and conducted by the Harvard Medical School.

So, the need is not just to lower the floor used for tabulating property-loss events, but also to broaden the range of types of events included. This isn't necessarily PCS' role; it may require some other entity – or combination of entities – since the issue extends well beyond the property side of the industry. I also believe this data is a public good and needs to be non-proprietary.

Takefive:

You have testified before and closely watched the proceedings of the National Association of Insurance Commissioner's Climate Change and Global Warming Executive Task Force. In your opinion, where do you see the insurance regulators ultimately going on the climate change/global warming issue?

Dr. Mills:

Regulators have a dual function of looking out for the welfare of consumers and the solvency of insurers. They can play a very constructive role in the climate discussion and in helping to enable the industry to cultivate solutions.

I offered a dozen [recommendations](#) to NAIC, which are elaborated here:

1. Stay current on the science. Although climate change is one of the more dynamic and rapidly developing areas of science, many commentators refer to decade-old information as "state of the art," typically resulting in overstatement of the uncertainties. Other parties exaggerate or ignore uncertainty through selective reporting—although their ranks are

Climate Change (September 2006)From Risk to Opportunity: How Insurers Can Proactively and Profitably Manage Climate Change (August 2006)Synergisms Between Climate Change Mitigation and Adaptation: An Insurance Perspective (May 2006)Availability and Affordability of Insurance Under Climate Change: A Growing Challenge for the U.S. (December 2005)"Insurance in a Climate of Change," Science (Vol. 308, Issue 5737) August 2005, pp.1040-1044.

thinning. The experience gathered by the NAIC through the years places them in a unique position to advance analysis that would further shrink the uncertainties.

2. Require that insurers collect and analyze more comprehensive data on weather-related losses and their insurance implications. As we discussed above, the full cost of weather-related insurance losses is not known. And, as the old saying goes, “you cannot manage what you don’t measure.” Relevant insurance loss data should be more readily available in the public domain and to the scientific community, preferably at no cost (which is currently not the case).

3. Raise the standards of practice for catastrophe modeling and create a non-proprietary modeling and data-collection entity. In order to assess exposures of insurers and their customers, CAT models should integrate the processes of climate change. More transparency is also needed. To my knowledge, the Florida Commission on Hurricane Loss Projection Methodology is the only formal state system for vetting these models.

4. Add climate-change interrogatories to the statutory annual statement in response to the need for public disclosure of insurer risk analysis of climate change. NAIC should develop template language for inviting insurers to articulate their efforts to understand and manage climate-change risk as part of the statutory annual statement.

5. Promote the development of climate friendly insurance products and premium incentives through model laws and/or regulations. NAIC should propose model laws for state legislators and/or insurance regulators, whose job it is to ultimately adopt them.

6. Require actuarial pricing of risks based on improved understanding of climate-related risks in combination with insurer accountability and attention to availability and affordability issues. Poorly differentiated premiums do not send the desired signals. That said, I do not believe the problems in the market can be simply blamed on rate regulation. It is clear in the aftermath of Hurricane Katrina that unregulated surplus, commercial and energy industry insurance lines and unregulated reinsurers had severe problems as evidenced by Florida’s recent creation of a Joint Underwriting Association to deal with commercial insurance. I should say, however, that while risk-based pricing is important, it alone is no panacea for our growing climate woes.

7. Take the lead on a coordinated national effort to improve disaster-resilience through the adoption, enforcement, and implementation of improved building codes. This is one of the key strategies, and the benefits have been well documented as have the enforcement failures. There are usually ample opportunities to go beyond code, and NAIC could play a role in that respect as well.

8. Promote “Rebuilding Right” following losses. Insurers can promote risk-prevention strategies in the context of rebuilding after losses. Fireman’s Fund offers insurance terms that encourage rebuilding to meet current “green construction” standards, some facets of which also make

buildings more disaster-resilient.

9. Promote partnerships with policyholders for loss mitigation. Examples include insurer loans for retrofitted buildings paid for with loss mitigation discounts. There is also a huge need for better consumer education and information.

10. Safeguard insurer surplus based on understanding of climate change and encourage prudent investments in technologies and industries that will be part of the solution. One way to accomplish this is to revise risk-based capital requirements to provide credits for “climate-friendly” investments, including carbon trading. Conversely, investments in polluting industries are likely to become more risky.

11. Encourage or require insurers to minimize their own carbon footprint. Leadership by example is important both symbolically and practically. Some insurers already participate in the national ENERGY STAR Program and other initiatives to trim energy use and greenhouse-gas emissions in their own operations.

12. Communicate industry needs and priorities to federal and local governments with lead responsibility for implementation. These range from updating antiquated flood plain maps, to performing climate change research, to implementing appropriate public-health measures, to reducing the emissions of greenhouse gases.

In pursuing these initiatives, I encourage the NAIC to reach out to include insurance companies whose employees possess considerable knowledge and skill for evaluating and addressing climate risks, as well as local and federal governments, lending institutions, insurance consumer groups, other regulatory bodies (e.g. the SEC), the scientific community, NGOs, and other entities such as energy utilities with an interest in managing the risks of climate change.

Takefive:

Finally, you have often written that while natural disaster and climate change risks are real, so are the opportunities for insurance companies. Can you elaborate on that statement and cite some of the opportunities you see for insurers?

Dr. Mills:

We identified [seven major categories of opportunities](#) and more than [100 examples](#) () actually being implemented by insurers.

Promoting Loss Prevention – through traditional risk management, (e.g. via “green” practices) that also increase disaster resilience and rebuilding right following losses.

Crafting Innovative Insurance Products and Services – for providers of energy-efficiency services (e.g. energy savings insurance), renewable energy projects, green buildings, pay-as-you-drive insurance and climate change risk management services.

Participating in Carbon Markets – there are big opportunities both on the underwriting and risk-management side as well as in the investment side of the house. At least one insurer offers an opportunity to its customers to purchase carbon offsets against their driving-related emissions.

Aligning Terms and Conditions with Risk-Reducing Behavior and Capitalizing on the “Halo Effect” – for example, insurers will see increased D&O exposures from their customers who either participate in releasing greenhouse-gas emissions or fail to make adequate strategic responses or otherwise avoid climate change impacts on shareholder value. Conversely, insurers have observed that customers engaging in sustainable practices can have better loss profiles. Richard Jones of Hartford Steam Boiler once referred to this as the “Halo Effect.” I think this is one reason that Travelers is now giving premium credits to drivers of hybrid cars.

Engaging in R&D and Direct Investment in Climate Change Solutions – by participating in the enormous opportunities for developing and investing in climate change solutions.

Building Awareness and Participating in the Formulation of Public Policy – through consumer information and education, having a voice in public policy discussions of climate change, and promoting energy-efficiency.

Leading by Example – through in-house energy management and reducing insurers’ own “carbon footprints” and disclosing climate vulnerabilities and liabilities to shareholders. U.S. insurers’ track record thus far on disclosure has been mixed.

Copyright © 2007 | [National Association of Mutual Insurance Companies \(NAMIC\)](#) | [User Agreement](#)