



SOCIETY OF ACTUARIES

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WHY SHOULD WE CARE ABOUT SUSTAINABILITY?

SUSTAINABILITY REFERS TO THE ABILITY OF HUMANS TO ENDURE FOR FUTURE GENERATIONS. WHAT CAN ACTUARIES DO TO HELP ENSURE THAT NATURAL RESOURCES LAST? BY MAX J. RUDOLPH

IN DECEMBER 2012, the International Working Group on Actuarial Sciences and Sustainability (IWGASS), held a summit to discuss climate change, sustainability and the actuary's role.

IWGASS was formed by the Society of Actuaries' (SOA) research department to identify research needs on sustainability and examine how actuaries could assist in analyzing, measuring and mitigating the associated potential risks. The one-day summit, held in Chicago, featured the following speakers and topics.

- Dr. Paul Brandt-Rauf, dean of the School of Public Health at University of Illinois-Chicago. Brandt-Rauf shared research about the feedback loop between humans and the natural environment. He noted that, until recently, humans had a small ecological footprint.
- Tim Harris, Milliman. He shared his thoughts about the skill set brought to the table by actuaries.
- Dr. Aled Jones, director of the Global Sustainability Institute (GSI) at Anglia Ruskin University in the United Kingdom. Jones shared his Limits to Growth (LTG) research project,

on which he has collaborated with U.K.-based actuaries. The focus is on energy, food, water, land, commodity, social mobility and environmental loading (quantifying a tipping point).

- John Richardson, currently with Guggenheim Insurance but at the time with CNO Financial. He provided background about how he became interested in this topic and shared some resources he has found valuable.
- Dr. Leonard Sonnenschein, president of the World Aquarium and Conservation for the Oceans Foundation. He discussed the signals given by the oceans relative to climate change. He also spoke on desertification.

A summary of the summit is available on the SOA website. The summit identified areas for actuarial involvement to quantify and measure potential financial implications of the risks, with opportunities to partner with other disciplines and organizations to analyze and model resource supply and demand. Max Rudolph, one of the attendees, provides the following thoughts on the summit and why actuaries need to pay attention to natural resource sustainability issues.—**Ronora Stryker**

EMERGING RISK NO. 1: SUSTAINABILITY

Sustainability refers to the ability of humans to endure for future generations. You might think of my old Scoutmaster's motto, "Leave a campsite better than you found it," taken to an extreme.

Since attending the Society of Actuaries' December 2012 Natural Resource Sustainability Summit, I've been thinking a lot more about the topic. For the last year I have been seeking out material, looking for information that could help me draw my own conclusions. Nothing I read was completely unbiased, and I'm sure my evolving opinions will be apparent here too. I am not an expert, just someone who wants to know more. My reading list recently included *This Time Is Different: Eight Centuries of Financial Folly* by Carmen Reinhart and Kenneth Rogoff, showing that high debt is not sustainable, and *Spillover: Animal Infections and the Next Human Pandemic* by David Quammen,

READ THE REPORT

Read the full report on the Natural Resource Sustainability Summit. Visit www.soa.org/NatResourceSustain.

ACTUARIAL SUSTAINABILITY ACTION

- Casualty Actuarial Society's Climate Change Committee
- Institute of Actuaries of Australia's Energy and Environment Committee
- The Institute and Faculty of Actuaries in the United Kingdom's Resource and Environment Member Interest Group
- International Actuarial Association (IAA)
- International Working Group on Actuarial Sciences and Sustainability (IWGASS)

which focuses on concerns about humans interacting with animals and sharing diseases. I am finding convergence from interactions between climate, economic conditions and disease. Although I will reference information I learned at the summit, this article reflects my views alone.

Much as the SARS epidemic led me to research influenza 10 years ago, Arctic sea ice melting has taken climate change from an interesting theoretical consideration to something impacting my daily life. Changes to the jet stream increase severe weather frequency and severity. Crops are moving north and uphill as the temperature increases. Insects follow the same pattern, sometimes without predators at the new locations. Interactions between risks act to intensify them, as when drought and infestation of forests lead to wildfires. From an ecosystem perspective, it is all happening too fast to smoothly evolve to a new equilibrium. Species are disappearing

faster than usual, leaving the earth more concentrated and less resilient.

All of these events will lessen economic productivity.

Sustainability has a time frame of forever, and considerations about sustainability issues should be dynamic, possibly using complexity theory to consider future alternative scenarios. This leads directly to a concentration on exposures, stress scenarios and "what if" analysis that focuses as much on qualitative as quantitative analysis.

It goes well beyond what I considered as a life company actuary or even in my enterprise risk management consulting practice. It focuses on previously rare events like running out of water, oil and arable land. The challenge is to put these emerging risk events into a financial context for decision making. How can we value changing trends of air and water quality in light of demographics and economic growth?

Areas have been identified for actuarial involvement to quantify and measure potential financial implications of the risks, with opportunities to partner with other disciplines and organizations to analyze and challenge. We need to carve out a seat at the sustainability table.

When we survey emerging risks, the focus is on risks that impact the respondents or their

company directly. Reinsurers of property and casualty risk have recently become involved with the topic, and the Casualty Actuarial Society has formed the Climate Change Committee. British and Australian actuaries have already been tackling the topic.

Actuaries have staked a claim to a role in enterprise risk management, focusing on aggregation techniques and quantification of risks. The mathematics involved to quantify risks comes naturally to the profession.

Our goal can't be to prove or disprove global warming. We must be objective and let the data speak. Our skeptical nature will prove useful when peer reviewing work done by those whose work is biased. Are recent changes nothing more than a natural cycle? Do our actions reinforce current cycles or is the natural cycle moving in an offsetting direction today, with accelerating trends in our future?

The earth's climate appears to be changing at a faster rate than its regular cycles would predict. While the earth will survive whatever humans throw at it, much like the dinosaurs, our reign won't last forever. The question is: Can we survive until the next great disruption (e.g., asteroid) or will we hasten our own demise? How seriously should we treat these changes? What is the downside if we answer this question wrong?

Few topics attract a more heated discussion than climate change. Statements differ about

AGENDA ITEMS

Sustainability will be a topic of discussion at the International Congress of Actuaries (ICA) 2014 meeting in Washington D.C., March 30 to April 4. Visit www.ica2014.org.



why the earth is warming, with explanations varying from natural cycles to human use of fossil fuels. Rare is the moderate view proposing cause and effect that can be accepted by all parties. This reminds me of the debate about the perils of smoking. Both sides manipulated statistics to “prove” their arguments. Bias was defined by your personal views. During this period, actuaries priced life insurance policies by segmenting smokers and nonsmokers yet avoided the broader discussion. In 2005, the Society of Actuaries entered the debate with *Economic Effects of Environmental Tobacco Smoke*, estimating the cost of second-hand smoke to society. By entering the discussion, actuaries were able to influence opinion and substitute facts for appearances.

During the industrial age, economies have used resources, polluted the air/water, and generally subsidized economic growth. One could view the next period in our history as one where we repay these subsidies. Economic growth will have to slow, perhaps to a negative level, in order to repair prior damage and proactively prepare for the costs of overshooting our ecological footprint. This could coincide with a low inflation rate scenario far into the future.

One thing we know for sure: It is easier—and cheaper—to address a growing issue early in its development.

Focusing on financial implications seems a natural place for actuaries to start. Costs will increase before the benefits are seen, so politicians will need to enact a longer time horizon than ever before. Environmental costs, whether reacting to extreme weather events or proactively building features that address rising sea levels, will eat into GDP growth. This should be a mainstream discussion. Rebuilding should

IWGASS MISSION STATEMENT

“To integrate the professional expertise of individuals around the world from academia to the actuarial profession and industry to identify and analyze risks, perform research, and propose solutions related to environmental issues that threaten long-term sustainability. In particular, the actuarial skill set of risk and uncertainty management and financial analysis will be brought to bear to quantify or monetize the impact of potential risk mitigation and adaptation strategies, while members of academia, industry, and the actuarial profession will present current key issues of environmental, social and economic importance, and their relevant models and data, that can be addressed using the actuarial skill set. Specific areas of study may include (but not be limited to) climate change, natural resource depletion, water and air pollution, land management, agriculture and energy issues.”

not be automatic after a hurricane or flood. Some areas should be allowed to revert to their natural state. It is easier politically to subsidize rebuilding than to make these tough decisions. Unbiased information is hard to find and maintaining perspective helps objectivity. The industrial age has viewed growth as a given for 300 years, but could it be a reflection of accounting practices that have ignored environmental degradation?

Whether the earth’s climate changes are long term or short, risk managers need to understand the potential implications in order to enter the discussion. There is a growing supply of material available about sustainability. Actuaries should review it before taking on redundant research. Much of the available material stresses the importance of being proactive about supply/demand issues and considering the planetary impact of the decisions we make. Some of the other actions actuaries can take, as discussed in the summit, include publishing research on the hypothesis that years of inaction look OK until a tipping point is crossed and the planet can’t recover and the impact of recent events such as droughts, wildfires and Hurricane Sandy;

use the second-hand smoke study as a model for a research project; research the sustainability of agricultural practices; and create a new section in the SOA devoted to sustainability research.

These discussions require longer time horizons than most people are comfortable with, seeking out leading indicators and tipping points. Climate changes in complex ways, incorporating interactions, self-corrections and surprises. It does not move in a straight line. Can we take the chance that the recent warming of the oceans, high levels of carbon dioxide and melting Arctic ice might accelerate in the future rather than recede? Someone needs to substitute facts for impressions, transparency for ignorance.

Why not actuaries? **A**

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