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**Testimony of**

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**on**

**"Impact of Global Warming on Private and Federal Insurance"**

**before**

**The Senate Committee on Homeland Security**

**and**

**Governmental Affairs**

I would like to thank Chairman Lieberman and Ranking Member Collins for holding this hearing on the impact of global warming on private and federal insurance. My name is Andrew Castaldi and I am representing Swiss Re, the largest reinsurer in North America and the world.

I am employed as the head of Swiss Re's catastrophe perils Americas team. The cat perils team is composed of natural scientists, engineers, and other experts who are dedicated to understanding the risk associated with worldwide natural hazards. In this role, we develop models that consider the economic and social impacts associated with natural hazards such as earthquake, wind, and flood.

Over the next 10 minutes I would like to share with you Swiss Re's view regarding climate change, how climate change may impact weather and natural catastrophes, how reinsurers model nat cat risk and finally a few words about

how we incorporate this information into our business.

Swiss Re‘s core property business includes mitigating the financial consequences of natural catastrophes such as hurricanes, earthquakes, and flooding. We provide life and property casualty reinsurance and products which facilitate the convergence of the insurance and capital markets. Our business is to assume the liabilities from others onto our balance sheet. Or to put it more simply – we take other companies’ risk off their hands. As risk experts our time horizon stretches out 50-100 years.

Our interest in climate change began almost 20 years ago and it has become an important component of our long-term risk management strategy. We believe unequivocally that climate change presents an increasing risk to the world economy and social welfare. There is now indisputable scientific evidence that the earth’s temperature is rising at an alarming rate and that this rise is due mainly to human activities. According to the Intergovernmental Panel on Climate Change, also known as the IPCC, it can be concluded now with a 90-95% probability that anthropogenic, or human produced, greenhouse gas increases from fossil fuel use, agriculture, and land-use changes have caused most of the observed increase in globally averaged temperatures since the mid-20$^{th}$ century. To put it simply, global warming is a fact and a robust response is required.

Climate change, over time, will affect weather and weather patterns. How it will affect severe weather events varies and depends upon the region of the world and natural hazard being evaluated. As an example, global warming suggests more extremes in weather, such as more intense rainfall or prolonged drought which may lead to more localized inland flooding or in the case of flood and drought, agricultural problems. Combining intense rainfall with rising ocean levels from melting polar land-ice and warming sea water will place much of our coastal properties at greater risk.

More to the interest of this panel, will global warming affect the annual frequency and severity of tropical cyclone activity? After the record setting experiences of 2004 and 2005, this is an often asked question. In 2005, we had more named North Atlantic storms and hurricanes than ever - 27. It was also the costliest hurricane season ever. The economic cost of Katrina alone was an estimated $135 billion. Rita, Wilma, and Katrina were the first, third and sixth strongest North American tropical cyclones on record.

Were the 2004 and 2005 seasons attributable to global warming? We do not know for sure. One or two years of experience is not enough to confirm a trend. But here is what we do know. On a world-wide basis, CO2 levels are up significantly and sea surface temperatures are higher too Hurricane severity is impacted by warmer waters. One recent study by Webster and Holland indicates a trend, since about 1970, toward more intense tropical cyclones. In the early 1970s, 17% of all tropical cyclones were category 4 or 5 hurricanes. That number has increased to 35% - an increase two times higher than it was just 35 years ago.

Today there are open questions. But, given its potentially catastrophic implications, the precautionary principle should be applied consistent with prudent risk management. It's quite clear that, if left unchecked, CO2 emissions will alter the natural variations of climate change and will affect US weather patterns and some natural catastrophes. Preventative action, therefore, must be taken today. If we wait until we have achieved absolute certainty, we run the risk of acting too late.

In many areas outside the Atlantic Tropical Cyclone basin, we see indications of global warming's impact on atmospheric hazards that are presently easier to quantify. In Europe, there is already enough evidence today to demonstrate that European winter storms have and will continue to increase with climate change. Swiss Re, and perhaps others, have incorporated these findings into our risk and

loss models for the European regions. Throughout the world our scientists continually monitor new studies on the subject and, once convinced, we incorporate the new science into our models. Presently, Swiss Re is collaborating with various research initiatives on the topic of how climate change will impact us here in the US and around the world**.**

In general, risk modeling varies depending upon the peril under study. For tropical cyclone wind and storm surge, Swiss Re starts with the historical database of the last 100+ years of storm activity and then considers the climate factors coinciding with each of those years. We use these historical records as a base and then apply current climate conditions in order to estimate the frequency and severity of tropical cyclones for future years. Very short term climate conditions are recognized too late to be incorporated into the models that the industry uses. Moderate term climate variability, such as the Atlantic Multi Decadal Oscillation (AMO) and other oscillations, cause a swing in the Atlantic sea surface temperatures and do correlate with hurricane intensity. The scientific community has not yet reached a consensus regarding the extent to which these oscillations are natural or exaggerated by human activities. Regardless of the cause, it is expected that the warm phase, which we are in now, correlates with increased hurricane activity. This warm phase is expected to last for the next 10-20 years.

This means we could be in for some bad weather for some time to come. Consequently industry models have been adjusted to bring them in line with the changing hazard and risk assessments. As a result, expected losses for natural peril covers in the US rose markedly. Modelers factored in a general increase in hurricane activity in the North Atlantic, regardless of cause, and quantified some other factors. These other aggravating factors include the following:

- increasing values and complexities associated with concentrations of risk in coastal regions,

- increasing vulnerability of assets and production processes, and
- increasing insurance penetration

These changes in risk assessment have prompted insurers and investors to take a more cautious look at the risks they take.

Some insurers have greatly limited their market participation in the Gulf Coast states. It is also true that Florida property owners are paying more for coverage than they did before. In light of these developments, some have suggested that natural catastrophes are not insurable in the private market and that a government backstop is required. This is not Swiss Re's view. Because these risks can be modeled by the private sector and are random in nature, they are insurable. The largest events can and have been adsorbed by the industry. We believe, therefore, that a government backstop for such risks is inappropriate public policy. There are steps the public sector can take to mitigate future damage including better zoning and building codes. These are key components to reducing our natural catastrophe vulnerability. We must all grapple with this new weather environment. We must recognize that we can no longer always build what we want or where we want.

Recognizing the importance of climate change, Swiss Re is deploying a broad strategy to confront the challenges including the following:

- working to understand the risk and adapting pricing and risk models accordingly
- developing products and services for mitigation and adaptation
- raising awareness especially with governments. We believe government must provide leadership by passing legislation to limit CO2 emissions and passing stricter and enforceable zoning and building codes and
- addressing our own environmental footprint by pledging to be

greenhouse neutral by 2013.

Swiss Re looks forward to sharing our knowledge and working with the Congress and other policymakers to develop workable and innovative ideas to bring more private capital to the insurance market.

Thank you for the opportunity to provide testimony on this critical issue.