RMS Testimony

NAIC Fall 2007 National Meeting
Property & Casualty Insurance Committee
Catastrophe Modeling Public Hearing

September 28, 2007

Bringing Science to the Art of Underwriting™

RMS™

What are catastrophe models?

Models are a complex series of equations and algorithms assembled to produce output that quantifies the risk from high severity low frequency natural and man made disasters

Construction of a catastrophe model is based on input from multiple disciplines such as:

- Meteorology, engineering, actuarial, computer science geophysical, seismology, statistical

Models are designed to estimate losses and quantify uncertainty from a given peril over a specified future time period

Models are based on scientific principles, historical information, and engineering judgment

Models are developed independently

- Customers have no input in results generated by the model
- Models are used by all parties involved in the risk transfer process
- Goal is to produce unbiased results

Invitation extended to RMS

"The committee is interested in hearing your (RMS) perspective regarding whether you should be considered and regulated as an advisory organization and your views on short-term hurricane modeling."

Should modelers be considered and regulated as advisory organizations?

If regulation of modeling companies is appropriate, ramifications on model independence should be considered

Modelers use and need to continue using all science available to provide the most accurate quantification of risk even if the results are unpopular

Burden to regulating entities to become experts on very complex models (several perils and regions)

What is the outcome and consequences of regulation? – model certification for use in all states?

What are we trying to achieve?

Models estimate future insured losses from catastrophes which assist insurance companies evaluate solvency, develop appropriate rates, and underwriting

The estimate needs to be forward-looking from today as insurance coverage is for the future, and claims will occur in the future

What is the appropriate timeframe for models

- Insurance policies generally cover an annual period
- However, estimating from season to season is difficult and subject to large variability
- Need to balance stability with responsiveness

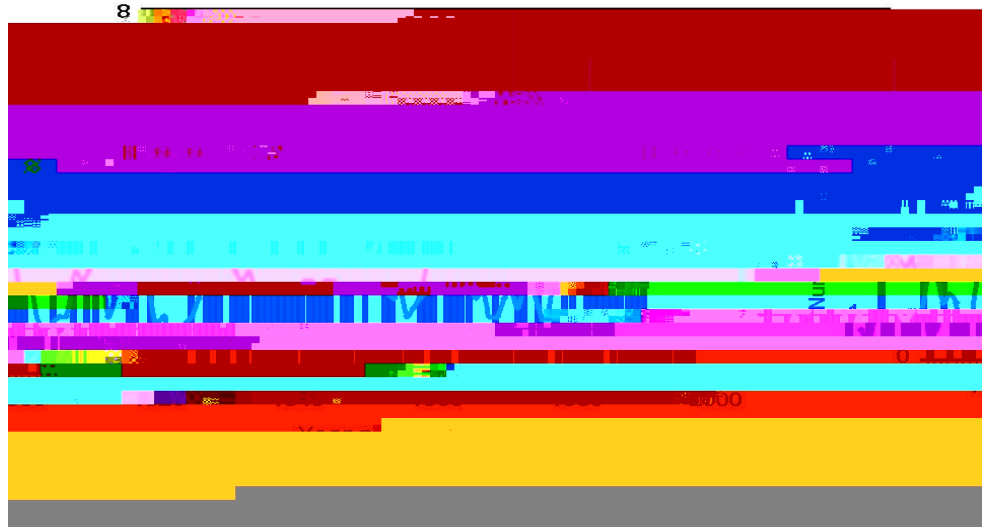
Atlantic basin hurricane activity has shown a marked increase

Since 1970 proportion of Cat 3-5 storms has increased

- 1995-2006 = 1.6x the 1900 – 1995 avg.

Since 1995 # of storms in Atlantic has increased

Illustrates the deficiency in using the long term historical average



Category 3-5 Atlantic basin hurricanes 1901-2006 and 5-year running average

What are the alternatives?

Difficult to precisely quantify impacts of natural cycles or climate change on frequency, intensity and geographical distribution of hurricane landfalls

Can carry out numerous different statistical analyses of the historical data and make extrapolations based on different assumptions

But many different analyses are plausible and it is a matter of judgment which analyses should be used to estimate futurec -0.000

Modeling under “deep” uncertainty

RMS believes judgments made under deep uncertainty are best made by independent experts

There is greater confidence in relying on the combined judgment of many experts rather than on just one

Expert elicitation is a rigorous methodology for making use of expert judgment

It has an established track record in many different areas of risk assessment, including earthquake, volcano and nuclear energy

It is still in early stages of adoption in meteorological science, but likely to become mainstream

International assessments of climate change rely on expert judgment because of the uncertainties

RMS summary on use of near term activity rates

In the Atlantic there has been an increase in hurricane intensity since 1970, and an increase in hurricane frequency since 1995

Strong consensus among experts that increased Atlantic activity will be prolonged (i.e. at least 10 years)

The simple long-term historical average is no longer appropriate for characterizing current U.S. landfall activity rates

Breaking free from a model of time-constant climatology also means we need to define explicitly the time horizon for model output

A five-year period into the future is appropriate, justified by both the current state of scientific knowledge and by the needs of users of model output