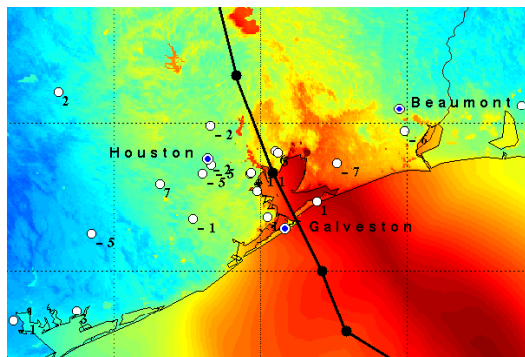


Catastrophe Modeling

Managing Complexity

Hurricane Science for Safety Leadership Forum
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History of Cat Modeling

- Defined as models which recreate the underlying physics of catastrophe events in order to estimate their potential and probability
- Earliest models in the mid 80's as computer power became available to do significant number crunching
- At the time the art was marrying the science of meteorology, with building wind damage (limited data in both).
 - Meteorological data is good from 1950's (satellite)
 - Little original data on damage factors from insurance companies – engineering data was relied upon



Catastrophe Modeling Timeline

- 1985 – 1992: Development
- 1992 – Hurricane Andrew
 - More than twice as bad as anyone had considered possible
 - Recognition that things could have been much worse if made a direct hit
- 1993-2001: Industry learns about:
 - Importance of collecting data
 - Statistics are hard to understand
- 2001 – 9/11: All big events are not in the models (\$35bn)
- 2004 – 4 FL Hurricanes - frequency can be much worse than expected
- 2005 – Katrina: It is hard to do correctly
 - Commercial business / data collection
 - Flood risk





Why is it interesting?

- Creates a synthetic long term timeframe to estimate risk
 - Wall Street – Mark to Market and VAR are not sufficient risk controls 😊
 - Estimates what could happen as well as what has already occurred
- Downsides
 - Very imprecise science - +- 20% (😊)
 - Delusional Exactitude
 - Data is sparse
 - Climate Prediction overlay is another dimension
- Upsides
 - Understanding the remote and defining risks is done much more robustly and objectively
 - Accounting for uncertainty and correlation in risk decisions
 - Measurement of what you can mitigate



Public Policy Question

- Progressive style auto rating for property coverages is not impossible
- The existing cross subsidies will be mitigated and can cause political disruption
- Free market with a green tint; models facilitate more deployment of capital since uncertainty is quantified for managers of risk
- Technology will win
- Mitigation is the answer





Conclusion

- Good people doing their best
- Expect the numbers to move around as we learn from actual events
- Climate change can be a game changer (150 years is not close to enough) – expect more climate volatility (or perception thereof)
- It is the best which can be expected vs. the cost
- Expect the process and knowledge gained from using the tools to become more prevalent