
Catastrophe Risk Management in Practice

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Agenda

- Introduction
- Catastrophe exposure management
- Event response planning
- Questions

Catastrophe Risk Management in Workers' Compensation

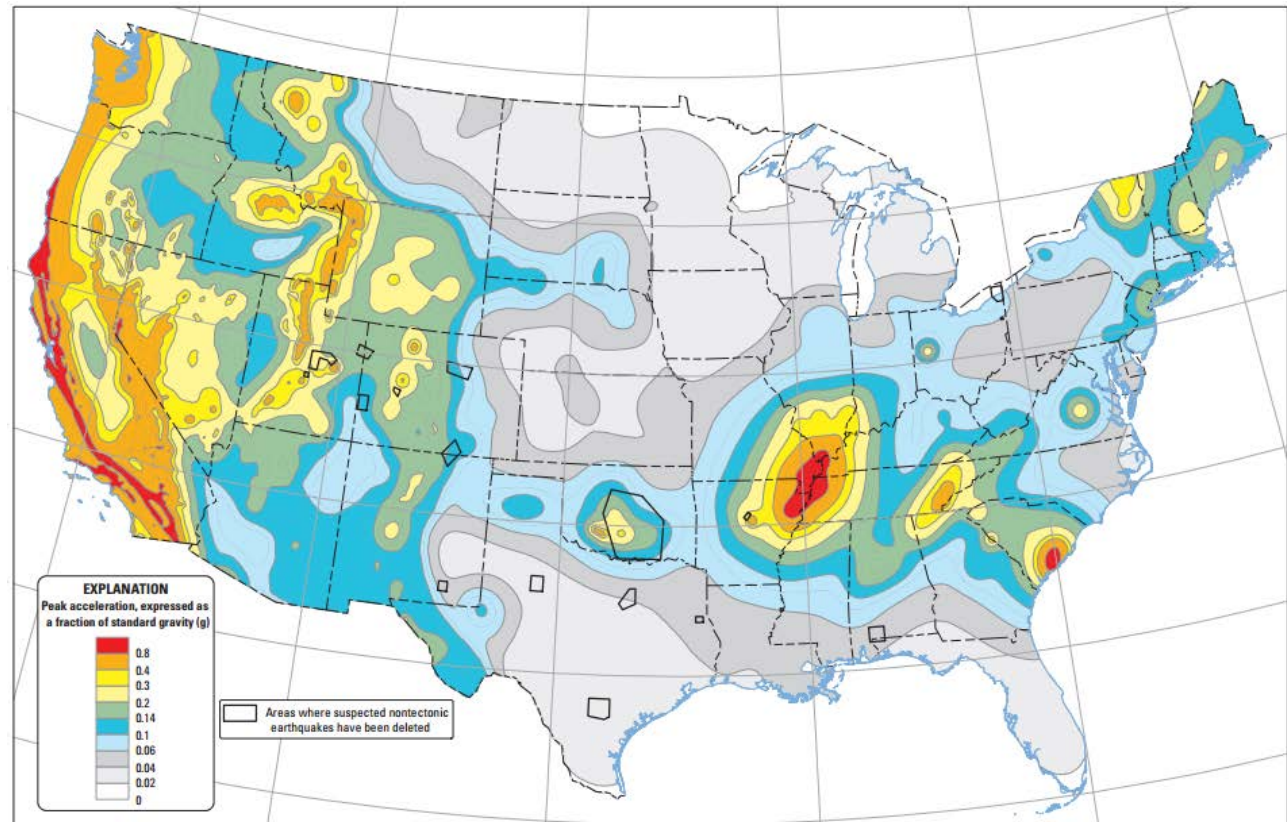
- Earthquakes represent the largest exposure in terms of frequency and severity in the U.S.
 - California is by far the largest risk as it has the highest frequency and severity.
 - Pacific Northwest and Intermountain West
 - South Carolina
 - New Madrid has low expected frequency but very high severity.
- Terrorism is second (low frequency)

Understanding Model Output - External

USGS seismic hazard map (2014 update): Peak Ground Acceleration for 2% probability of exceedance in 50 years

This particular dataset provides a good measure of potential earthquake severity for long-term community planning.

When you step back and consider the one to five year exceedance probability, you see it is describing the type of exposure an insurance firm should not (and effectively could not) hold capital against.

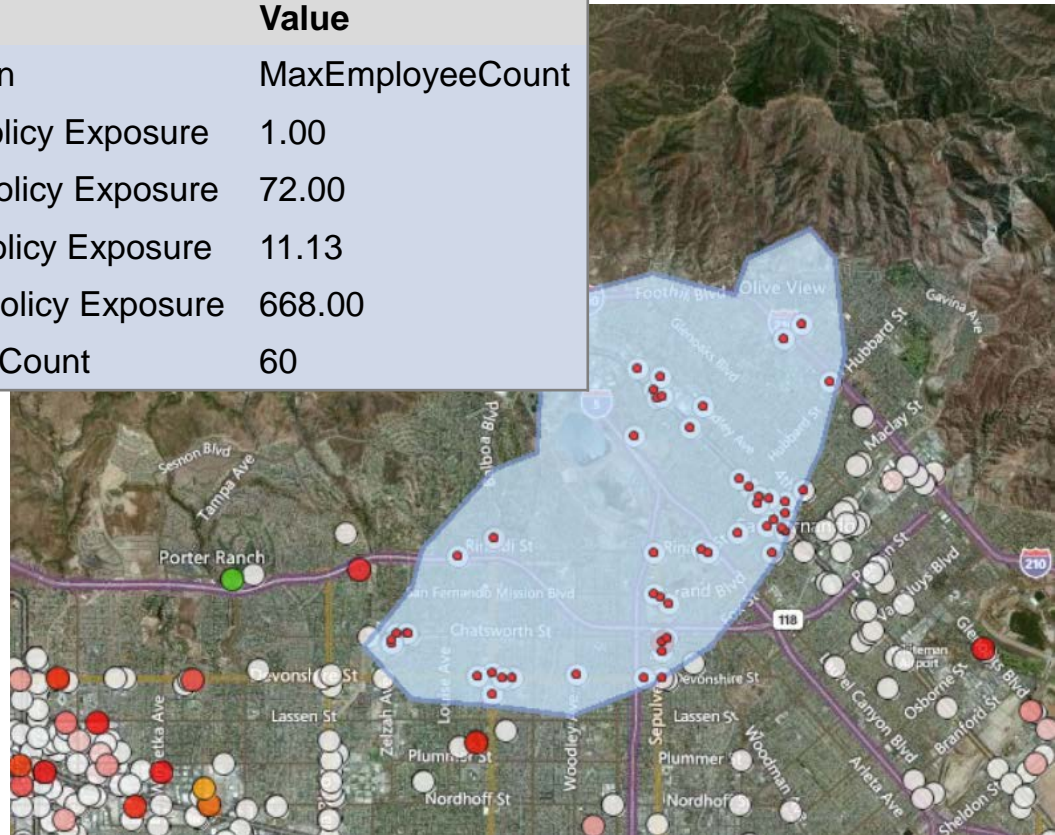


Internal Exposure Monitoring – Underwriting

Sample output of exposure monitoring tool

- Identify payroll and employee count concentrations at high level (state / region).
- Drill down to find concentrations within a specified distance of a concentrated location.
- Review contribution of new or renewing large accounts before writing.

Name	Value
Column	MaxEmployeeCount
Min Policy Exposure	1.00
Max Policy Exposure	72.00
Avg Policy Exposure	11.13
Sum Policy Exposure	668.00
Policy Count	60



Internal Exposure Monitoring – Capital Model

Simulated sample output from internal economic capital model

- Use catastrophe loss distributions from peril modeling software in internal economic capital model.
- Measure risk metrics (e.g. TVaR) at region level.
- Make appropriate use of these in profitability measures, both internal and regulatory.

Exceedance Probability	CoTVaR of Net U/W Loss by Region (\$MM)				
	1	2	3	4	All Other
0.1%	757	47	106	68	25
0.5%	222	27	35	37	57
1.0%	135	19	23	29	53
5.0%	53	10	11	17	39
10.0%	39	8	8	14	33
20.0%	28	6	6	11	26
30.0%	23	5	5	9	22
40.0%	20	4	4	8	19
50.0%	17	4	4	7	16
60.0%	15	3	3	6	14

Capital Consumption Approach

Exceedance Probability	Capital Call Charge	CoTVaR of Net U/W Loss by Region (\$MM)				
		1	2	3	4	All Other
0.5%	10.0	222	27	35	37	57
1.0%	5.5	135	19	23	29	53
20.0%	3.0	28	6	6	11	26
Capital Call Cost		50	8	9	14	29

$$\left(\begin{array}{c} \text{Capital} \\ \text{Call Cost} \end{array} \right)_{segment} = \sum_i \left(\begin{array}{c} \text{Exceedance} \\ \text{Probability} \end{array} \right)_i \cdot \left(\begin{array}{c} \text{Capital} \\ \text{Call Charge} \end{array} \right)_i \cdot (\text{CoTVaR})_{i,segment}$$

Note: the specific Capital Call Charges in this table are intended as illustration of the method, not pricing guidance.

Real-time Exposure Monitoring

“In normal times, most monitoring will not be exciting. It is in times of crisis, when the situation is changing dramatically, that management will be looking for real-time assessments to use in making critical decisions.”

Achieving Near-Real-Time Risk Monitoring: Risk Appetite Revisited

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Event Response Planning

- Benefits
 - Improves company's ability to react quickly to events.
 - Provide early estimate of financial impact to stakeholders.
 - Proactively reach potentially affected policyholders to improve loss outcomes.
 - Establish goodwill with policyholders.
- Plan
 - Establish process for early impact estimate.
 - Plan for increased demands on claims department.
 - “All hands on deck” approach?
 - Plan for increased demand on and impairment of provider networks.
 - Atypical injuries
 - Plan for damage to/inaccessibility of corporate offices.

Questions

Contact

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