A Closer Look at Wildfire Risk Assessment

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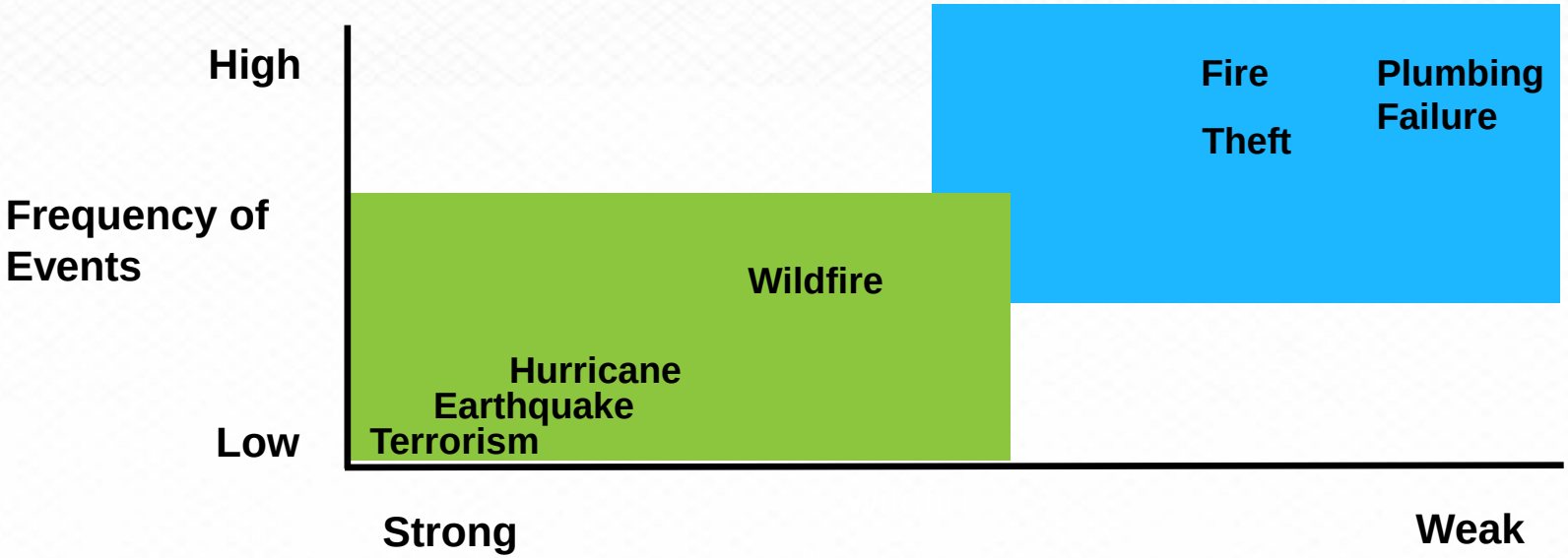
AIR WORLDWIDE®

Different Perils Have Different Characteristics



Catastrophe perils have the potential to display contagion and/or have low frequency that can distort historical experience.

(See Actuarial Standard of Practice No. 39 published by the American Academy of Actuaries)

Why Use Catastrophe Modeling to Estimate the Financial Risk of a Catastrophe Peril

Infrequent, unpredictable, and have a large impact

- Historical losses insufficient

Today's loss potential differs from historical experience

- New properties continue to be built in areas of high hazard
- Building attributes and values are changing over time

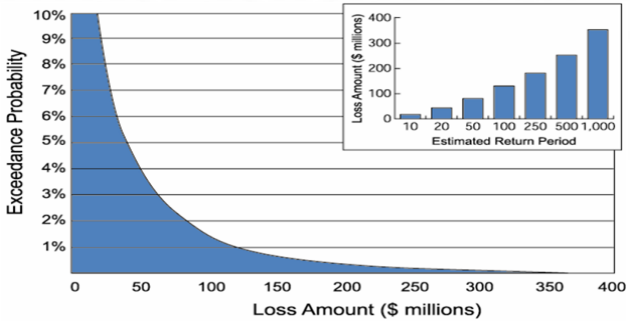
Advantages of catastrophe modeling

- Captures current exposures (property at risk)
- Provides complete probability distributions of modeled loss

Insurable Properties

Catastrophe Modeling Software

Risk Evaluation



What Questions Are Catastrophe Models Designed to Answer?

- Where are future events likely to occur?
- How frequent and intense are they likely to be?
- For each potential event, what is the estimated range of damage and insured loss?
- What is the probability of a given level of loss?

Future Losses Will Continue to Diverge From Historical Record

- Development intersects with undeveloped lands
  - Fuels are in close proximity or intermixed with exposures
    - Allows fire to move easily from natural fuels into populated areas
  - Largest economic loss from wildfire will occur in WUI
- 1/3 of the US populations live in the WUI (USDA)
  - Population continuing to grow
    - Future losses will continue to diverge from historical record

By Jeff Turner (Fire At Night)
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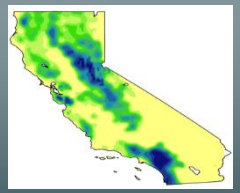
Catastrophe Peril Modeling Framework

HAZARD



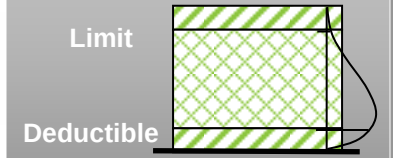
Event Generation

Intensity Calculation

Exposure Information

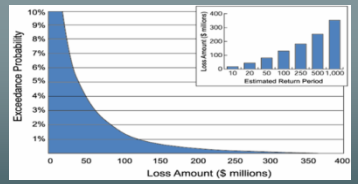
ENGINEERING

Damage Estimation



Policy Conditions

FINANCIAL



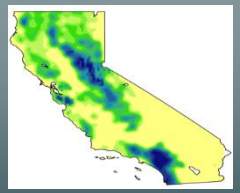
Loss Calculation

Catastrophe Models Layer Additional data onto the Historic Record

- Weather data
- Seasonal ignition frequency
- Fuel
- Elevation
- Related slope and aspect
- Vulnerability of a structure
- Accessibility of locations for fire suppression efforts

Apply the Catastrophe Model to Estimate Risk

HAZARD



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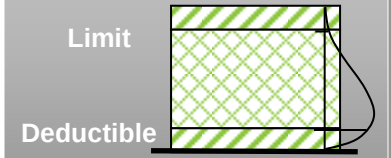

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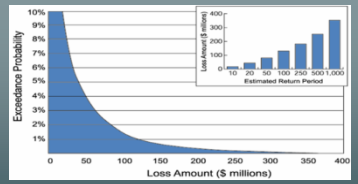

Loss Calculation

Exposure Data Important to Model Wildfire Risk

- Location
- Construction
- Occupancy
- Roof Cover
- Exterior Wall Type

A Step Beyond Hazard Metrics

- Hazard metrics useful for understanding which properties are at risk given that a fire moves through an area
  - Hazard metrics sometimes designed to indicate severity but not frequency of loss
- Difficult for metrics to reflect all the important interplay of risk factors
- Seasonal ignition frequency and wind patterns are the most important driver for the fire coming into an area

Model Results Can Be Used to Assess Exceedance of Certain Underwriting Guidelines

- Pre-defined loss profile
- Relative risk of location or policy against another
- Marginal impact of the location/policy on the company's portfolio loss profile