

AON

US Severe Convective Storm

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What Problems are we Trying to Address



Current market solutions are not well accepted

- Significant underestimate, especially in the aggregate
- Tornado-dominated tail with potential under-representation of tail events from other subperils



Current market solutions lack transparency and flexibility

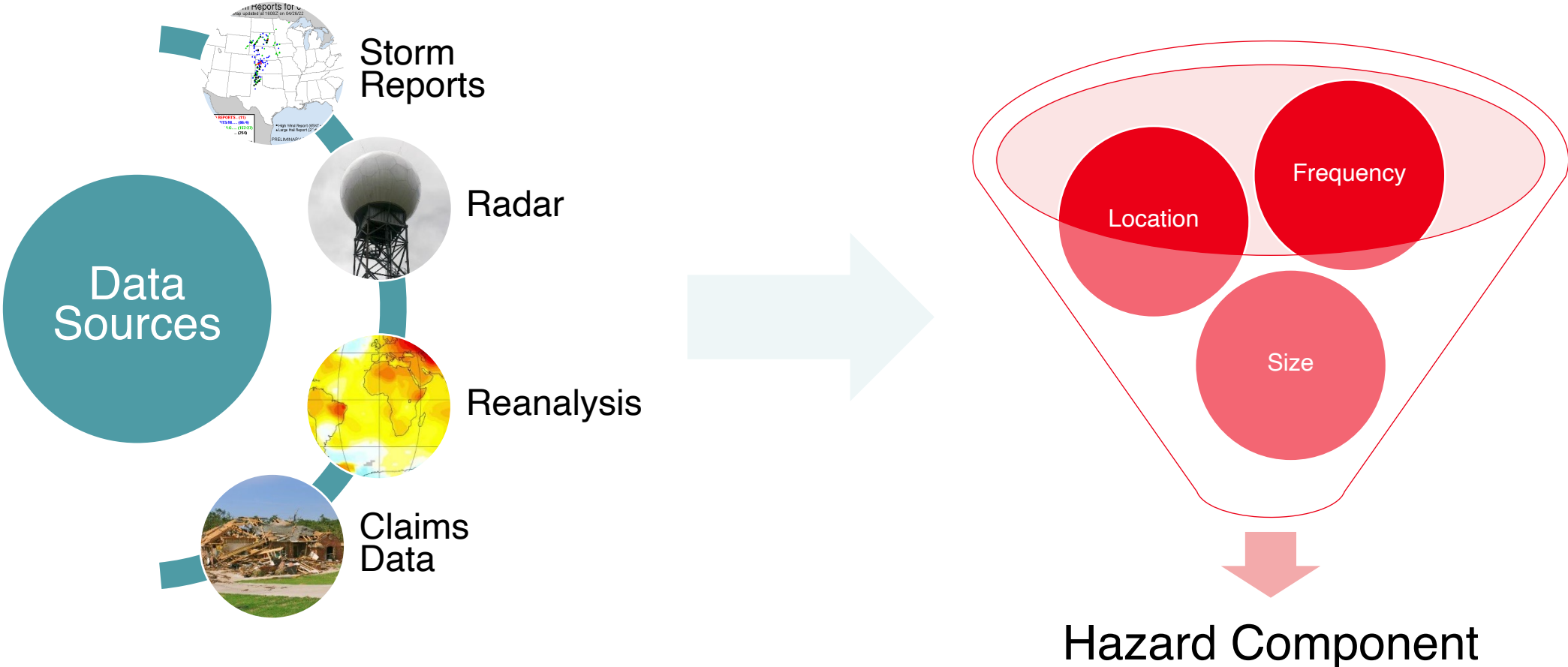
- Current solutions are opaque and difficult to modify
- Restrictive licensing agreements



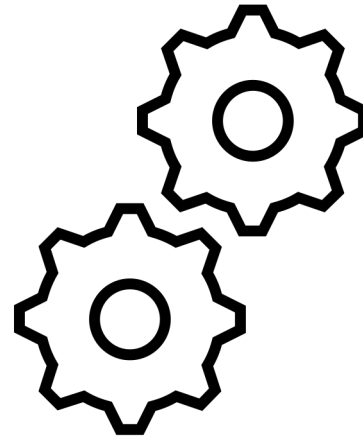
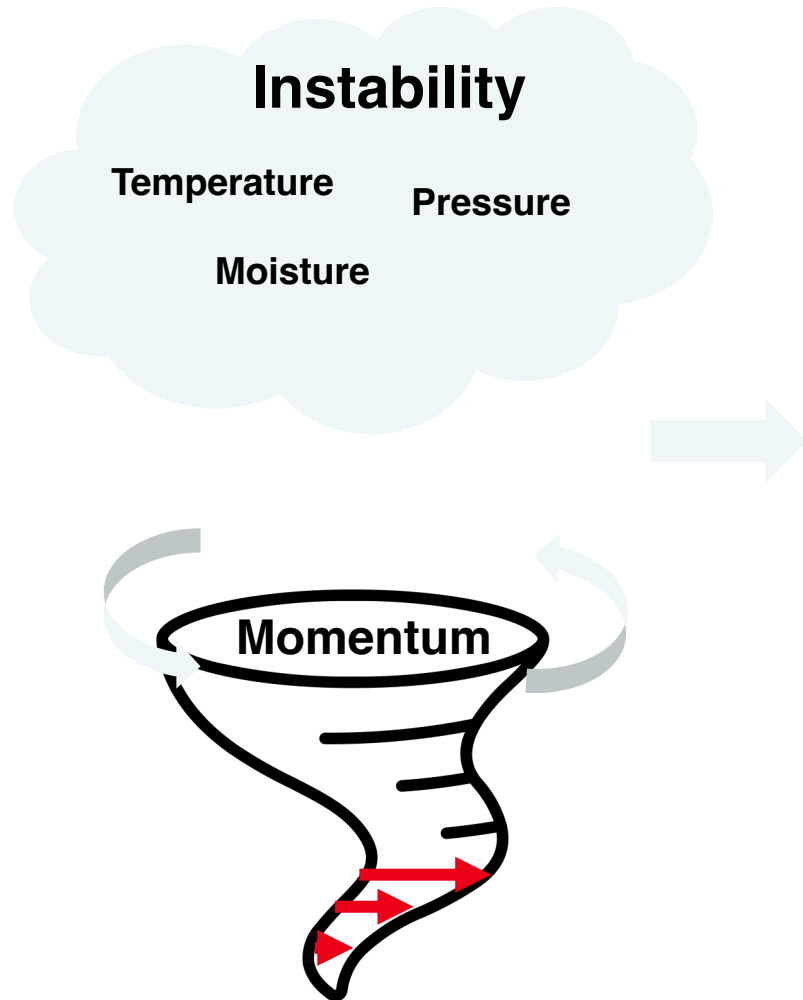
A credible alternative view of risk is needed to supplement (or replace) existing solutions

- New model must be equally robust and capable, but with pain points removed

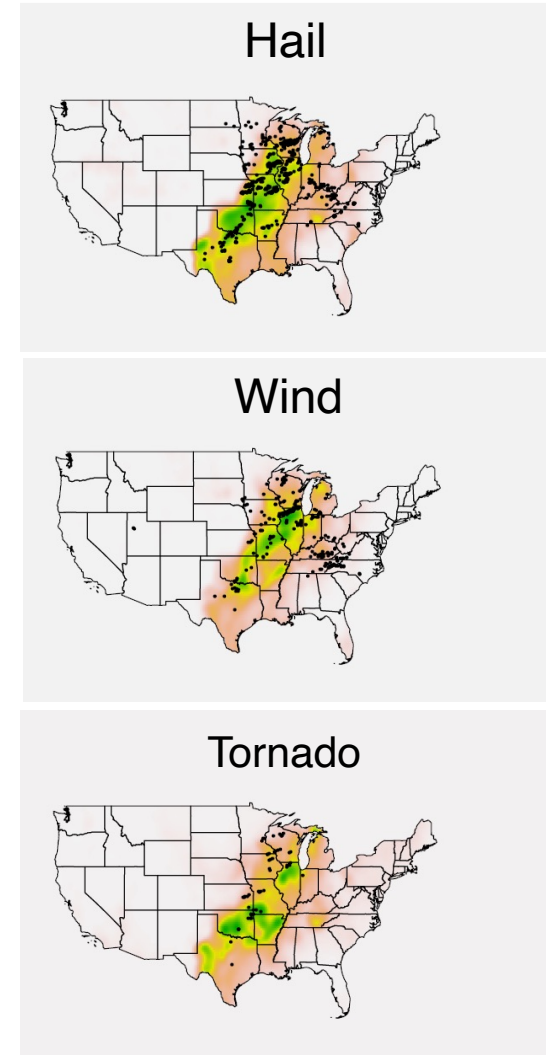
Hazard Component Leverages a Wide Variety of Data and Methods



Bringing it All Together

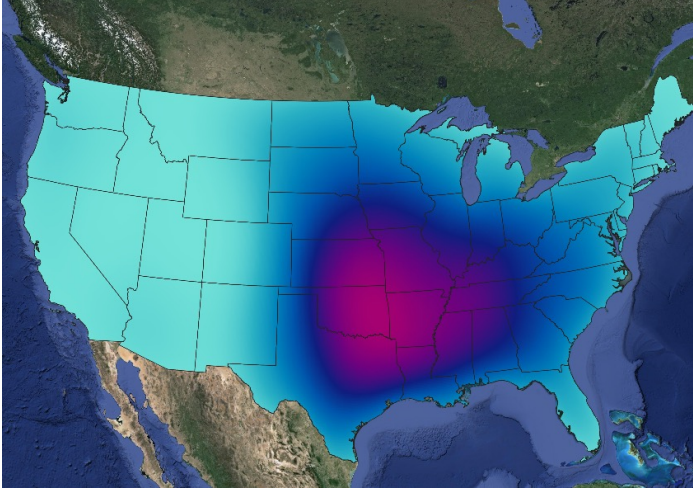


Statistical Models
(GAMs, Poisson point
processes, Gaussian
Spatial Fields)

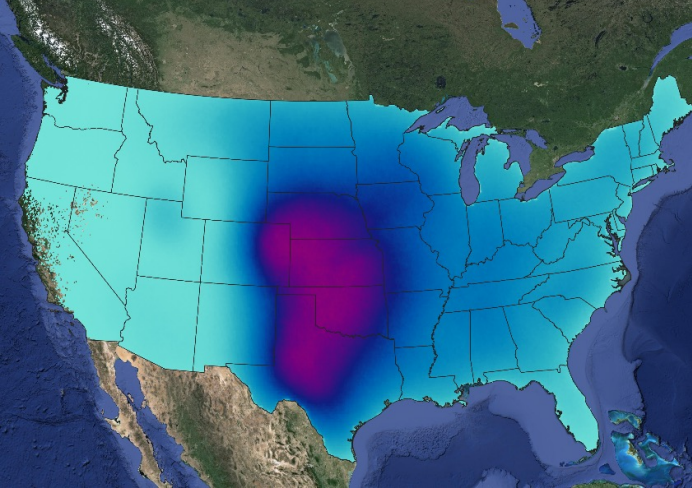


Preliminary Spatial Frequency

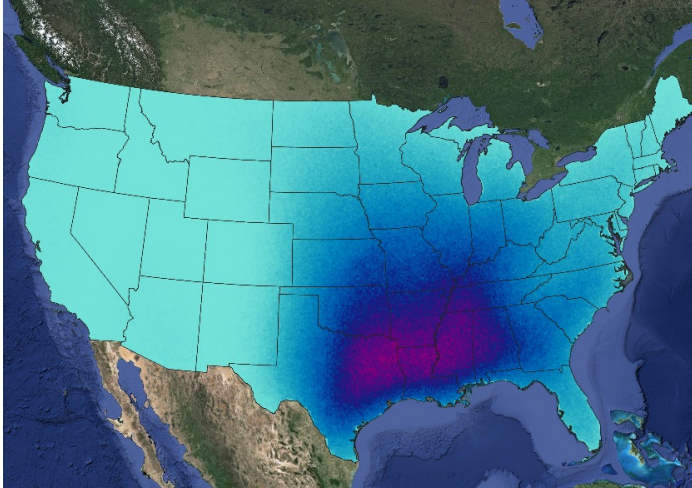
Wind



Hail



Tornado



Low
Frequency

High
Frequency

Vulnerability Development Takes a Ground-Up, Component-based Approach



Loading

(Force of peril on the structure)

- Roof Covering and Cladding
- Windows/Doors/Garage Doors
- Roof-Wall-Foundation Connections
- Roof Shape/Slope/Orientation

- Hail Size and Density
- Hail Duration
- Fall Velocity and Angle
- Wind Magnitude, Direction, and Gradient
- Torsional/Uplift Forces

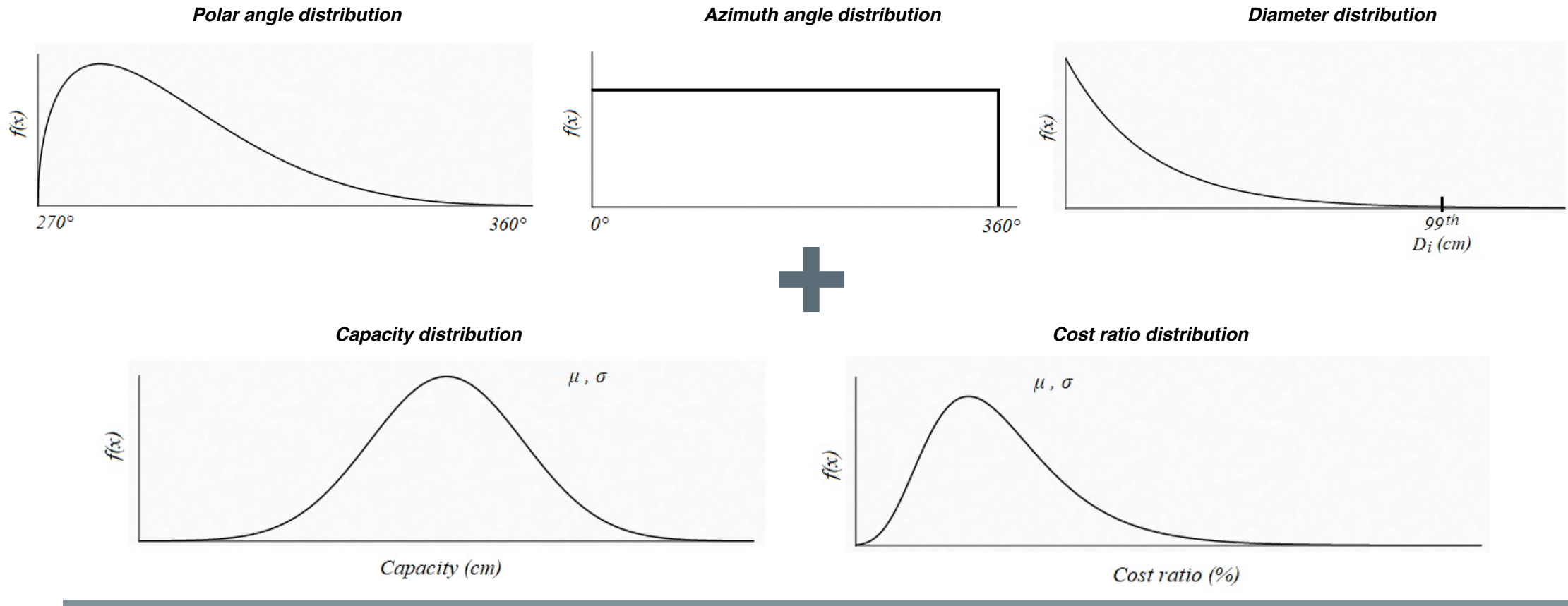
Resistance

(Ability to withstand load without breaking)

- Relative Cost of Components
- Premium vs Economy
- Supply Chain/Demand Surge

Cost

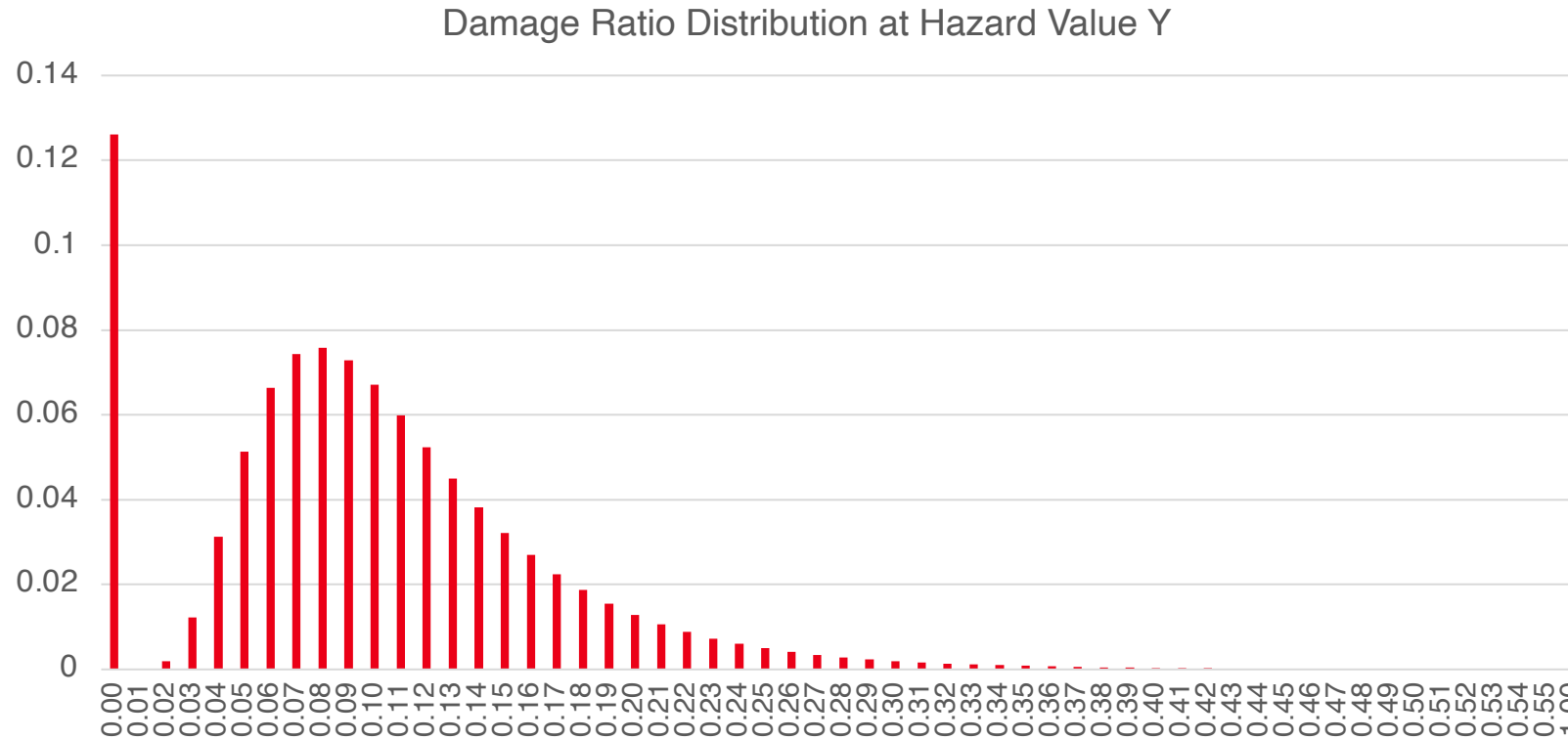
Once Load, Resistance, and Cost Distributions are Defined, Monte Carlo Simulations Provide Damage Distributions



Damage Distribution

Vulnerability Differentiators

Explicit modeling of the probability of zero loss gives a better estimate of claim frequency and more realistic damage ratios



How Did Oasis Play a Roll in Model Development?

- **Initial model structure (Hazard and Vulnerability) is based on the Oasis model format, though some modifications were required**
 - Support for 3-subperils
 - Secondary modifiers
 - Not leveraging the full Oasis loss engine or framework
- **Some Oasis benefits:**
 - Support for non-parametric uncertainty distributions allowed for better accommodation of our vulnerability simulation framework
 - Unification of exposure coding leveraging the ODS
 - While the customization required makes direct deployment of the model in the Oasis LMF, consistency in model format and implementation would make future deployment easier

A Summary of Our Differentiating Factors



Methodology

Robust, hybrid methodology accounting for the physics and statistical properties of the peril



Clarity

Most recent data supplemented by third-party collaborations to provide a more thorough view of the hazard



Vulnerability

Component-based simulation framework allowing for better insight into sources of loss



Uncertainty

Thorough and transparent treatment of uncertainty, visible directly in the model results



Transparency

A flexible and transparent modeling approach, allowing for examination and modification as desired



Quality

Backed by Aon's considerable market experience and Impact Forecasting's modeling expertise

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