NAIC NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

Date: 7/7/23

Virtual Meeting
CATASTROPHE RISK (E) SUBGROUP
Tuesday, July 18, 2023
1:00 – 2:00 p.m. ET / 12:00 – 1:00 p.m. CT / 11:00 a.m. – 12:00 p.m. MT / 10:00 – 11:00 a.m. PT

ROLL CALL

Wanchin Chou, Chair	Connecticut	Anna Krylova	New Mexico
Jane Nelson, Vice Chair	Florida	Alexander Vajda	New York
Rolf Kaumann	Colorado	Tom Botsko	Ohio
Judy Mottar	Illinois	Andrew Schallhorn	Oklahoma
Travis Grassel	Iowa	Will Davis	South Carolina
Sandra Darby	Maine	Miriam Fisk	Texas

NAIC Support Staff: Eva Yeung

AGENDA

1. Consider Adoption of its Spring National Meeting Minutes —*Wanchin Chou (CT)* — Attachment A
2. Discuss its Working Agenda—*Wanchin Chou (CT)* — Attachment B
3. Receive an Update from its Catastrophe Model Technical Review Ad Hoc Group—*Wanchin Chou (CT) and Jason Butke (Travelers)*
4. Discuss Wildfire Peril Impact Analysis—*Wanchin Chou (CT)*
5. Hear a Presentation from Verisk on Severe Convective Storms Model Update and Technical Review—*Julia Borman (Verisk)* — Attachment C
6. Discuss Flood Insurance Market—Shana *Oppenheim (NAIC) and Nancy Watkins (Milliman)* — Attachment D
7. Discuss Any Other Matters Brought Before the Subgroup—*Wanchin Chou (CT)*
8. Adjournment

Draft Pending Adoption

Attachment --
Capital Adequacy (E) Task Force
3/23/23

Draft: 3/22/23

Catastrophe Risk (E) Subgroup
Louisville, Kentucky
March 21, 2023

The Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met March 21, 2023. The following Subgroup members participated: Wanchin Chou, Chair (CT); Virginia Christy, Vice Chair (FL); Rolf Kaumann (CO); Susan Berry and Judy Mottar (IL); Sandra Darby (ME); Tom Botsko (OH); Andrew Schallhorn (OK); and Miriam Fisk (TX). Also participating were: Travis Grassel (IA); Julie Lederer (MO); Liz Ammerman (RI); and Steve Drutz (WA).

1. Adopted its Jan. 30, 2023, 2022 Fall National Meeting Minutes

Chou said the Subgroup conducted an e-vote that concluded Jan. 30, 2023, to adopt proposal 2022-12-CR (2022 U.S. and Non-U.S. Catastrophe Risk Event Lists), which the Subgroup had exposed for a seven-day public comment period ending Jan. 25, 2023.

Schallhorn made a motion, seconded by Botsko, to adopt the Subgroup's Jan. 30, 2023, (Attachment XX) and Dec. 12, 2022, (*see NAIC Proceedings – Fall 2022, Capital Adequacy (E) Task Force, Attachment XX*) minutes. The motion passed unanimously.

2. Received an Update from its Catastrophe Model Technical Review Ad Hoc Group

Chou said that the Catastrophe Model Technical Review Ad Hoc Group met once a month with different modeling vendors to gain a better understanding of different vendor models. He invited Shaveta Gupta (NAIC) to provide an update for the Ad Hoc Group at the meeting. Gupta said the Ad Hoc Group was re-established in late 2022 to conduct a more in-depth review of various severe convective storm catastrophe (CAT) vendor model assumptions, limitations, and impact analysis. Ultimately, recommendations will be provided to the Subgroup for consideration. She stated that so far, four model vendors have given presentations to the ad hoc group on their respective severe convective storm models. She said the ad hoc group is in the process of collecting technical questions from its members based on the materials that modeling vendors presented. Also, she anticipated that follow-up meetings with each modeling vendor to provide further responses and explanations would be scheduled after the Spring National Meeting.

3. Discussed the Wildfire Peril Impact Analysis

Chou said in order to ease the CAT modelers' concerns regarding their proprietary information while evaluating the impacts and determining the appropriate risk-based capital (RBC) catastrophe risk charge for wildfire peril, the Subgroup members will be required to sign nondisclosure agreements (NDAs) with the vendor modeling companies. He encouraged all the Subgroup members to sign the NDAs, which will be distributed shortly after the Spring National Meeting. Chou said he will continue providing updates during the Subgroup's next meeting.

4. Discussed its Working Agenda

Chou summarized the changes to the Working Group's 2023 working agenda, which included the following substantial changes: 1) moving item 1 from the "carryover items currently being addressed" section to the

"ongoing items" section; 2) eliminating "evaluate the possibility of allowing additional third-party models or adjustments to the vendor models to calculate the CAT model losses" and "evaluate the possibility of enhancing the independent model instructions"; and 3) adding "quantify the R5 ex-cat factors for wildfire peril (for informational purposes only)" and "evaluate the impact of flood peril to the insurance market." Chou said the working agenda will be forwarded to the Property and Casualty Risk-Based Capital (E) Working Group for consideration.

5. Heard a Presentation from Travelers on the Climate Overview and Scenario Analysis

Chou said the Subgroup appreciates Travelers Insurance providing a climate overview and scenario analysis presentation to the Subgroup. Eric Nelson (Travelers) said this presentation (Attachment xx) includes the following items: 1) industry loss trends; 2) catastrophe risk management; 3) climate change overview; 4) market disclosure landscape; 5) vendor capabilities; 6) climate scenario analysis; 7) mitigation and resiliency; and 8) observations. Chou urged the interested parties to review the materials and provide feedback to the Subgroup during its next meeting.

Having no further business, the Catastrophe Risk (E) Working Group adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/Spring 2023National Meeting/Task Forces/CapAdequacy/Cat Risk SG/03-21propertycatsg.docx

Priority 1 – High Priority
Priority 2 – Medium Priority
Priority 3 – Low Priority

CATASTROPHE RISK (E) SUBGROUP
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2023

2023 #	Owner	2023 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
Ongoing Items – P&C RBC							
P1	Cat Risk SG	1		Continue development of RBC formula revisions to include a risk charge based on catastrophe model output:			
				a) Evaluate other catastrophe risks for possible inclusion in the charge - determine whether to recommend developing charges for any additional perils, and which perils or perils those should be.	Referral from the Climate and Resiliency Task Force. March 2021	4/26/21 - The SG exposed the referral for a 30-day period. 6/1/21 - The SG forwarded the response to the Climate and Resiliency Task Force. 2/22/22 - The SG adopted proposal 2021-17-CR (adding the wildfire peril for informational purposes only). The SG continues reviewing other perils for possible inclusion in the Rcat. 8/11/22 – The TF adopted Proposal 2022-04-CR (2013-2021 Wildfire Event Lists) 9/26/22 – The SG formed an ad hoc group to conduct review on ~~different~~ servere convective storm models. 7/18/23-The SG are finishing reviewing the following SCS vendor models: RMS, Verisk, KCC, and Corelogic.	4/26/2021
Carryover Items Currently being Addressed – P&C RBC							
P7	Cat Risk SG	1	2024 Spring Meeting	Quantify the R5 Ex-cat Factors for wildfire peril (for informational purposes only) - Evaluate the possibility of adding PR018A to determine the R5 including the wildfire peril			3/21/2023
P8	Cat Risk SG	2	2025 Spring Meeting	Evaluate the impact of flood peril to the insurance market			3/21/2023

The Verisk Severe Thunderstorm Model for the United States

Dr. Julia Borman

July 18, 2023

Introduction to Verisk Extreme Event Solutions and Catastrophe Modeling

Verisk

Formerly known as AIR Worldwide

A Brief History

- Founded the catastrophe modeling industry in 1987
- Scientific leader of risk modeling software and consulting services
- Locations in Boston, Halifax, London, Munich, Beijing, Tokyo, Singapore, and Hyderabad
- Grown to serve more than 400 clients in a wide range of industries, including insurance, reinsurance, finance, corporate, and government

Extreme Event Models in 110+ Countries

Regulatory Client Services Team

Evaluation

- Submissions
- Reviews

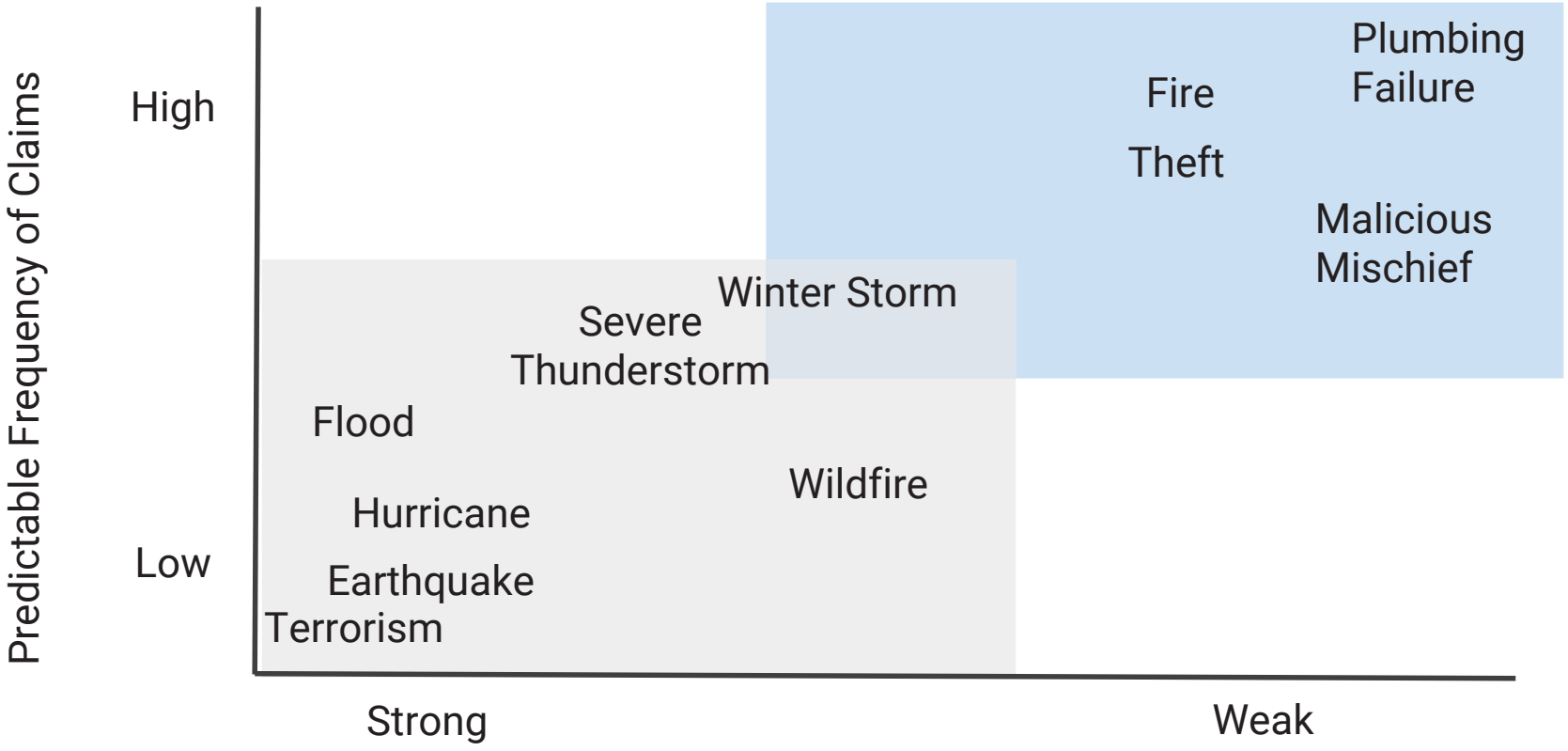
Education

- Presentations
- Webinars
- Blogs
- Whitepapers

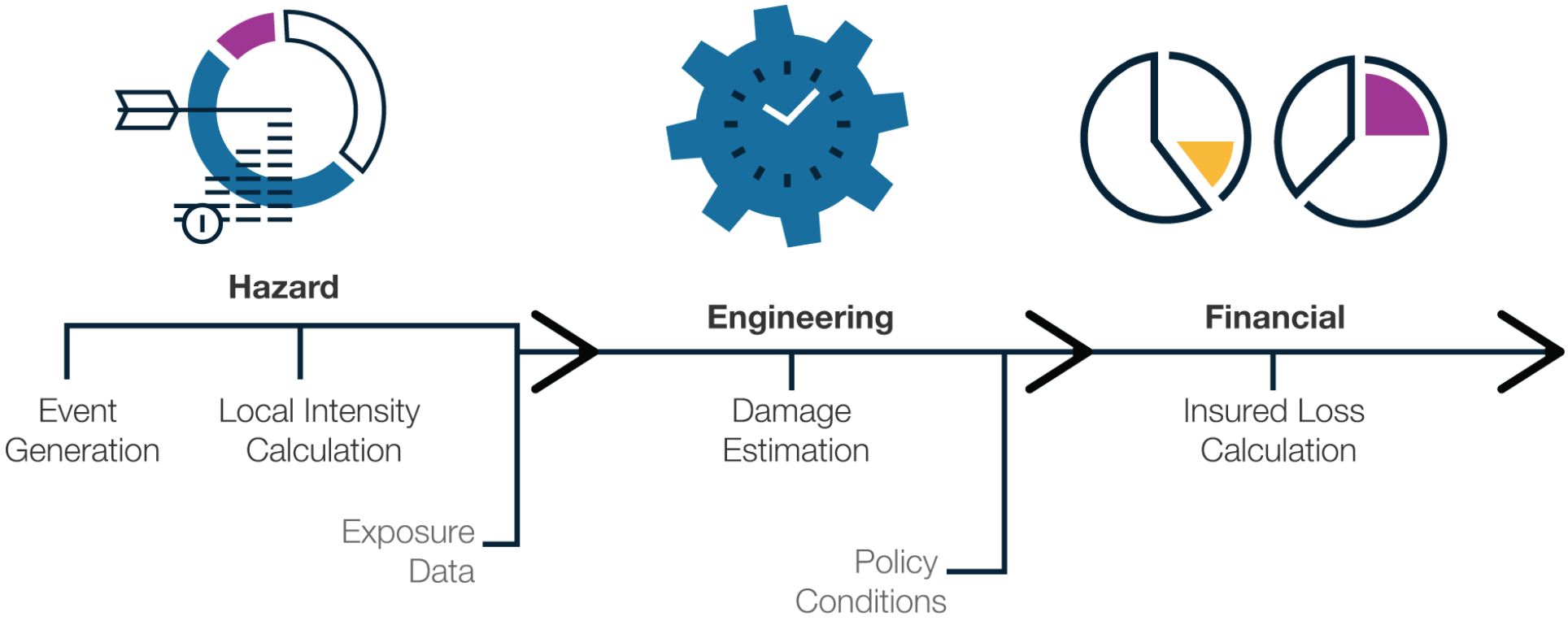
Support

- Ratemaking
- Solvency surveys
- Data calls
- Regulation

Traditional Methods of Estimating Loss Ineffective for Catastrophe Risk Management



Extreme Event Modeling Framework



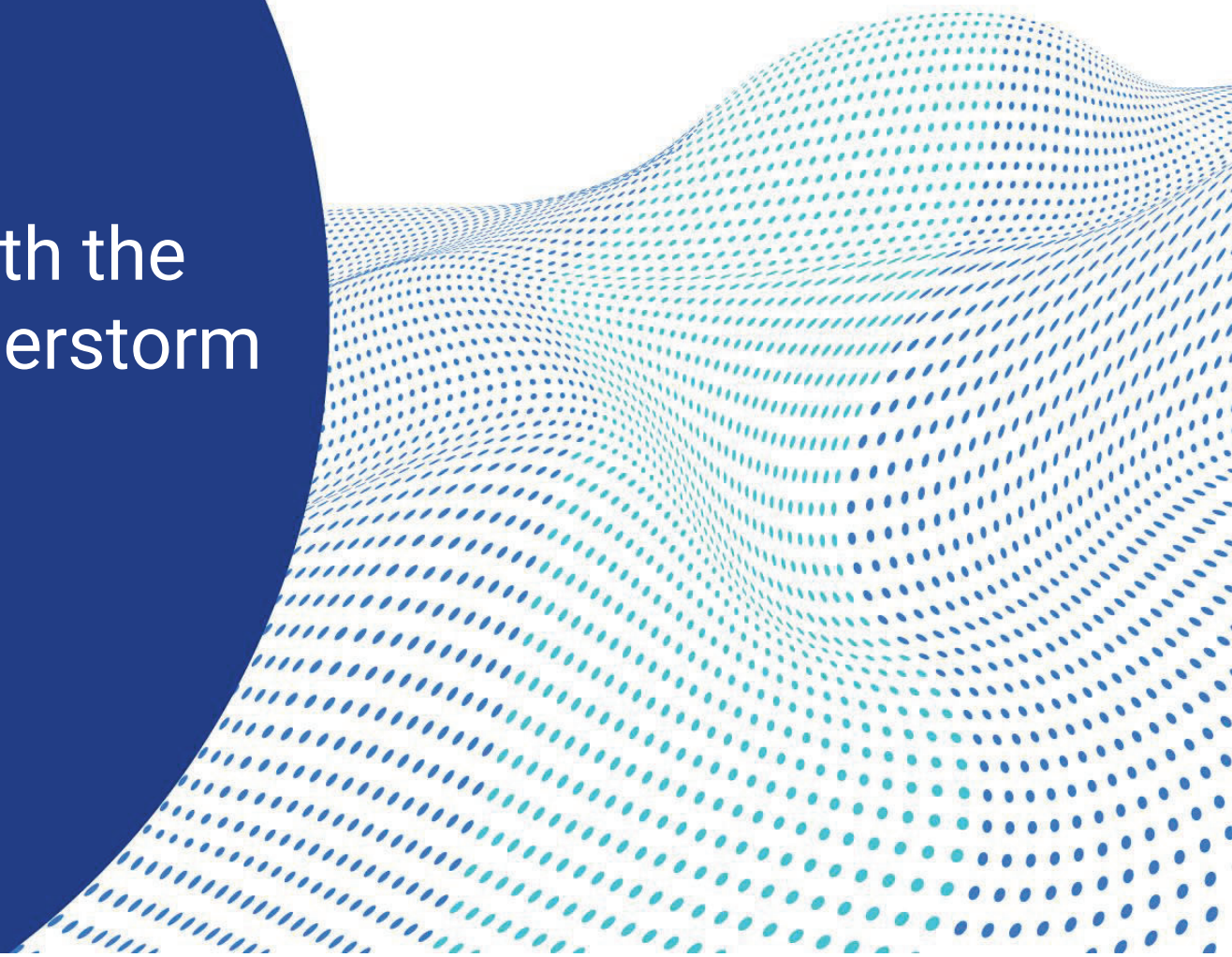
Touchstone Software – Inputs, Models, Outputs

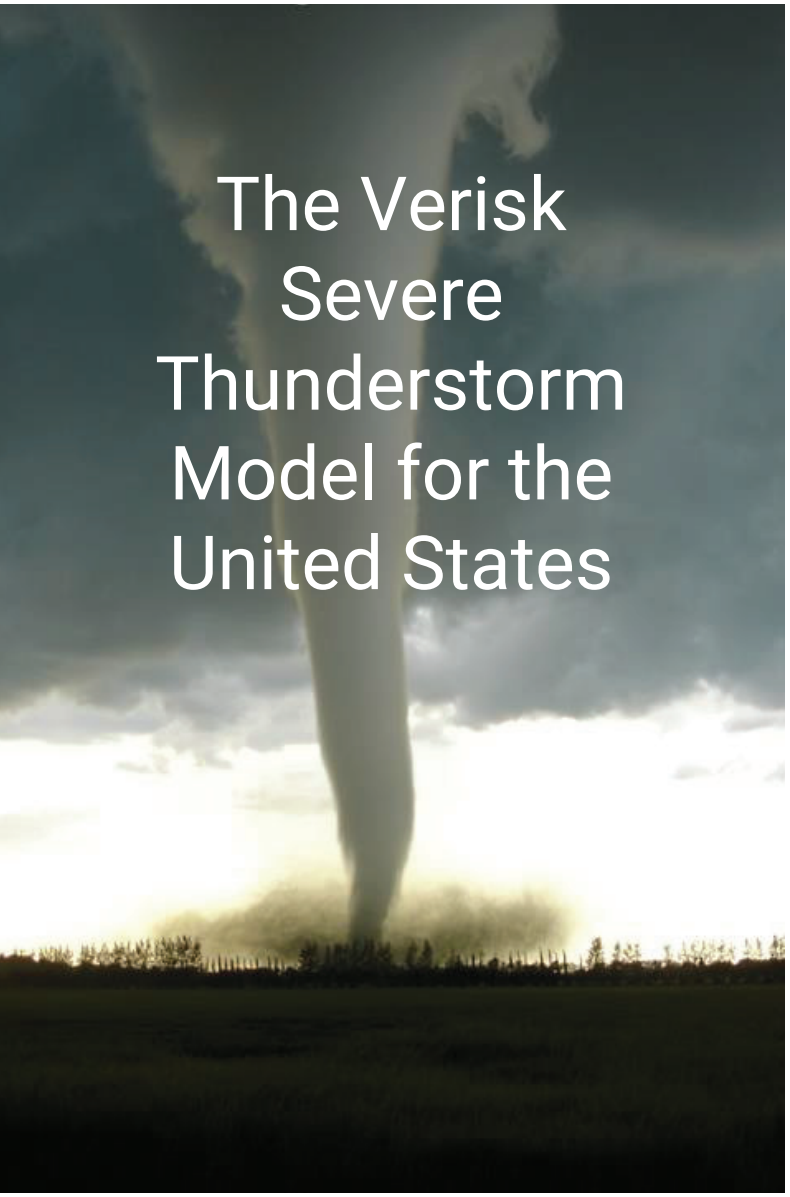
Company Detailed Exposures

TOUCHSTONE®

Catastrophe Loss Estimates

Approaching Risk with the Verisk Severe Thunderstorm Model for the U.S.

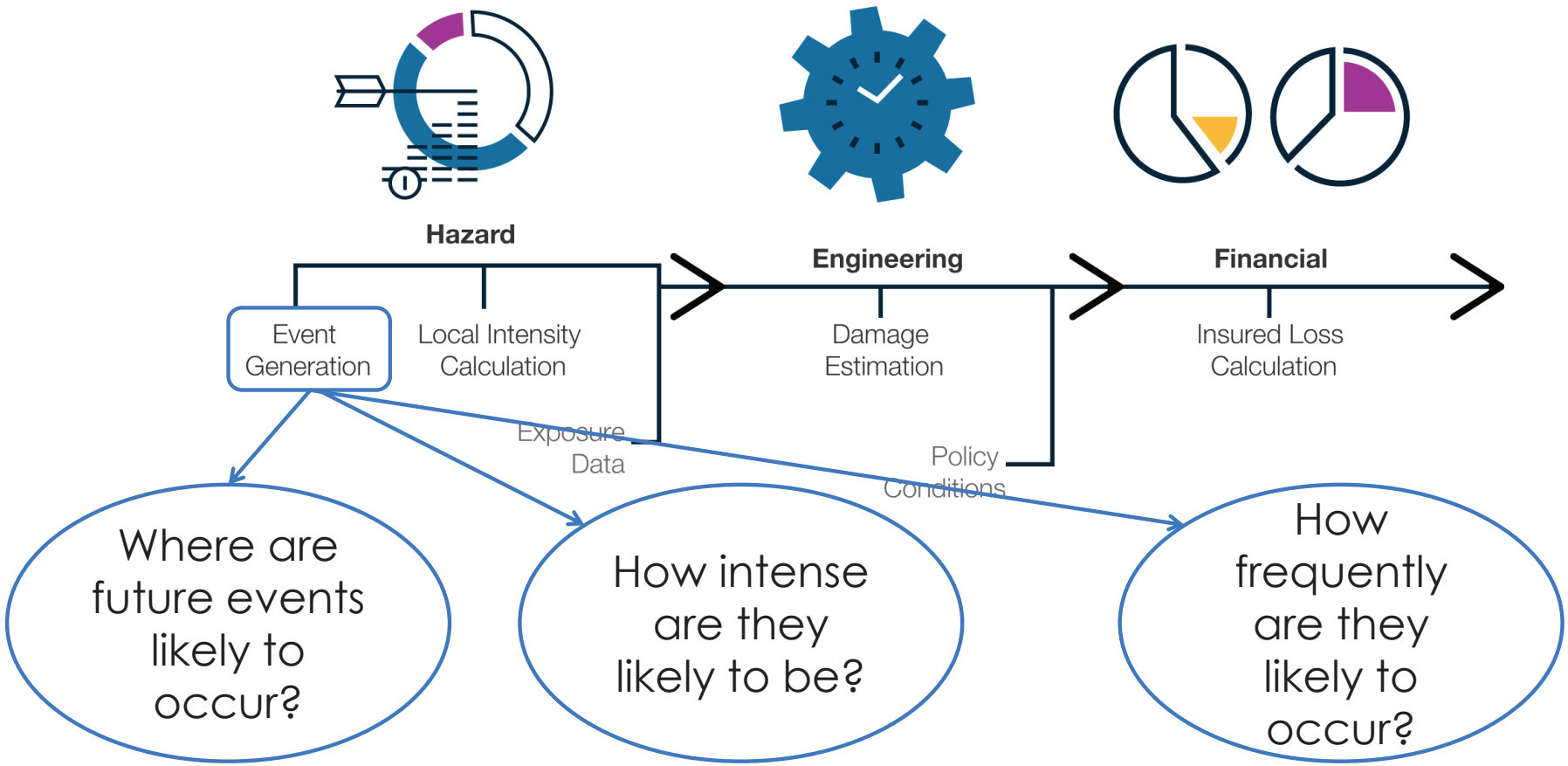




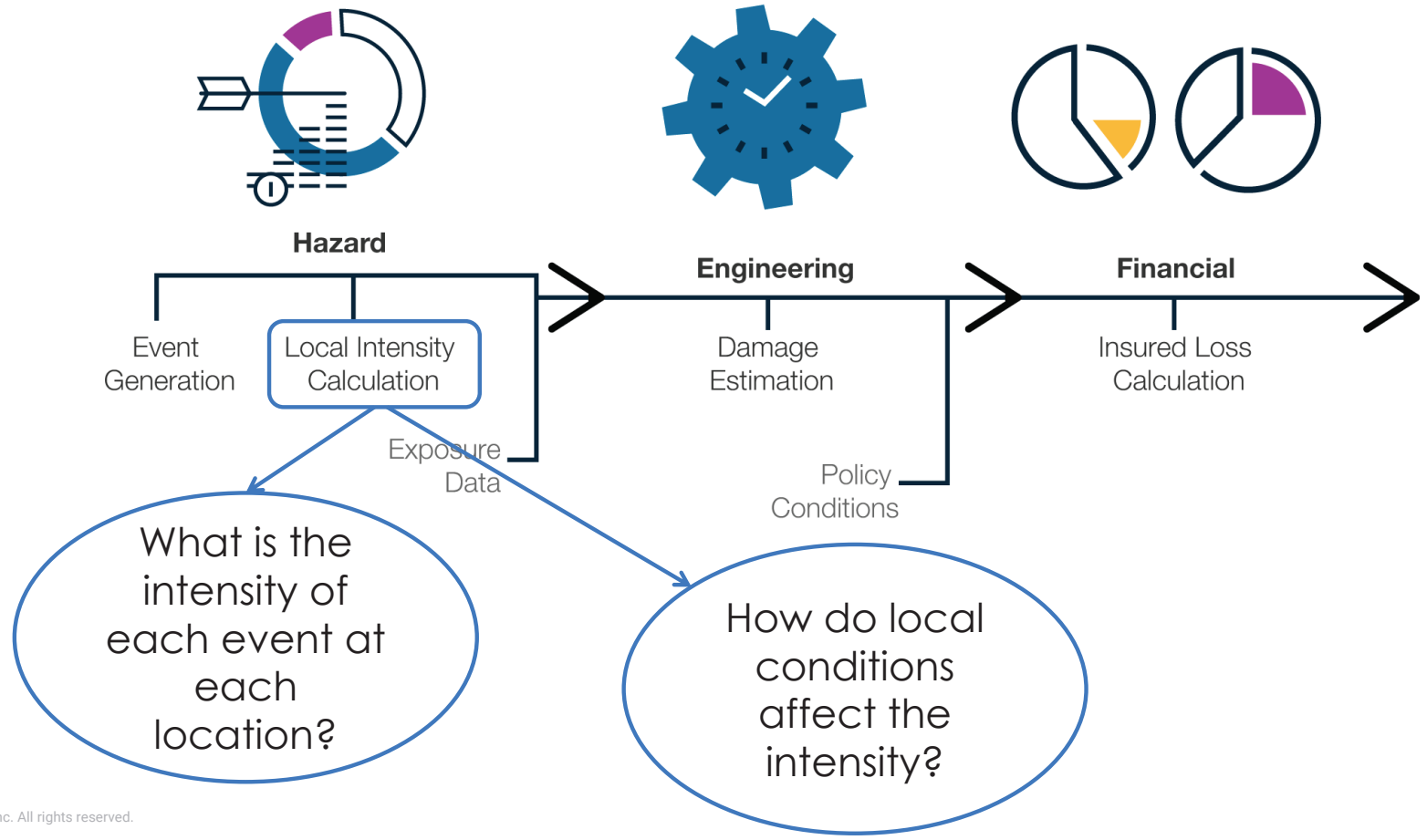
The Verisk Severe Thunderstorm Model for the United States

- Modeled Perils:
  - **Straight-line wind**
  - **Hail**
  - **Tornado**
- Model Domain:
  - **Contiguous United States**
- Model Resolution:
  - **90-meter**

Hazard Module: Event Generation



Hazard Module: Intensity Calculation



Data is a Key Component of the Model

Observation Data Sets

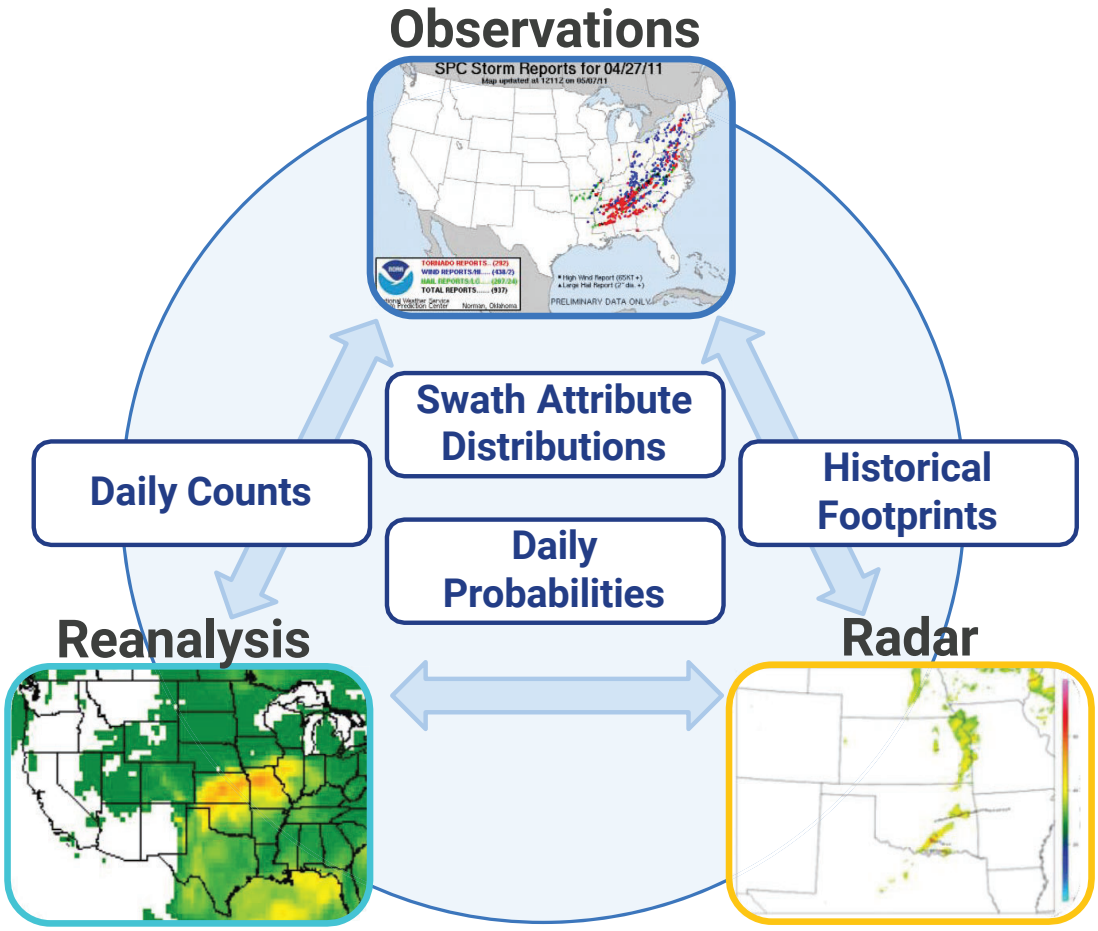
- Storm Prediction Center **(SPC) – 40 years**
- Community Collaborative Rain, Hail and Snow Network **(CoCoRaHs) – 21 years**
- Severe Hazards Analysis and Verification Experiment **(SHAVE) – 10 years**
- Insurance Institute for Business and Home Safety **(IBHS)**

Reanalysis Data Sets

Climate Forecast System Reanalysis **(CFSR) – 40 years**

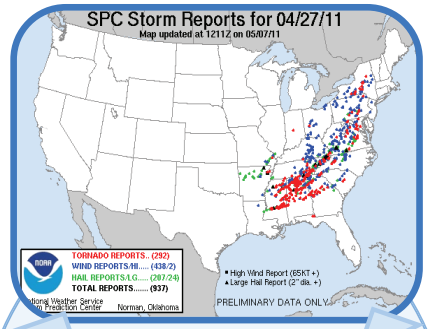
Radar Data Sets

- 20 years of continuous data
- Verisk's Respond® data

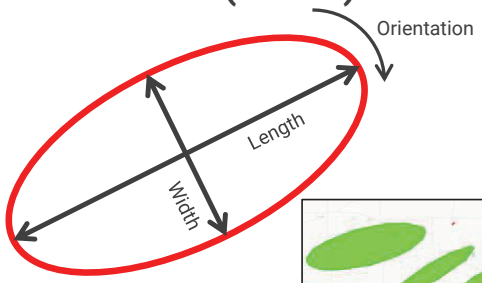


Complementary Data Sources Inform All Hazard Components

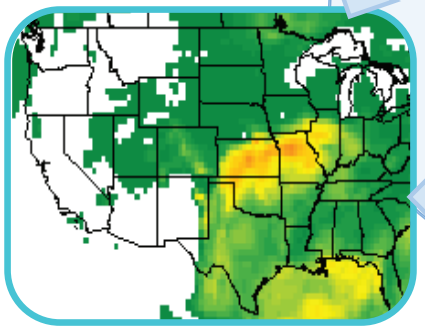
Observations



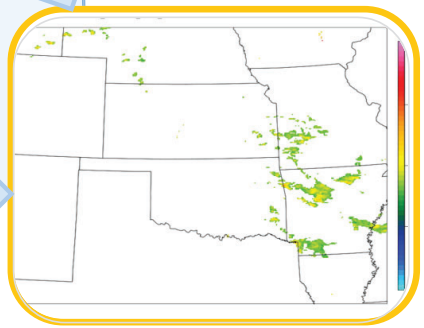
Microevent (swath)



Reanalysis



Radar

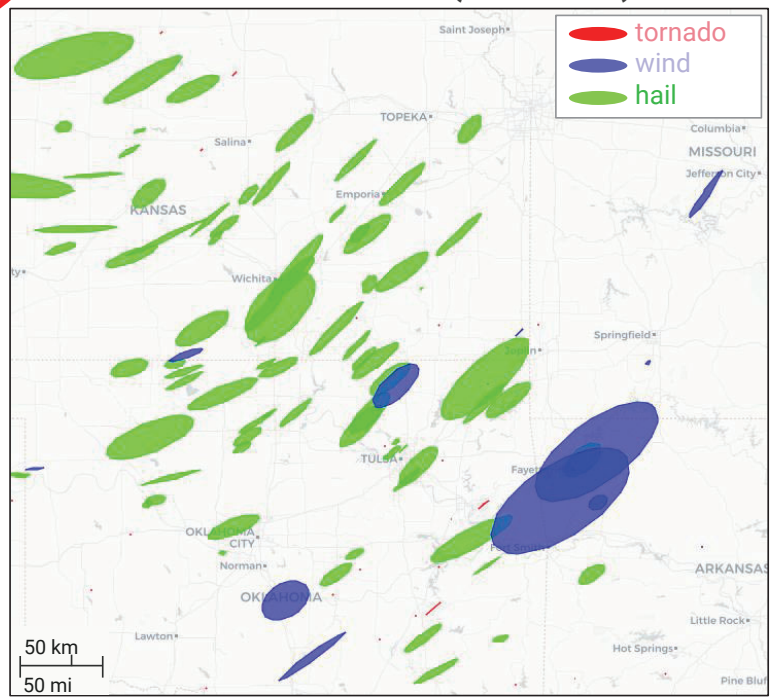


Frequency

Location

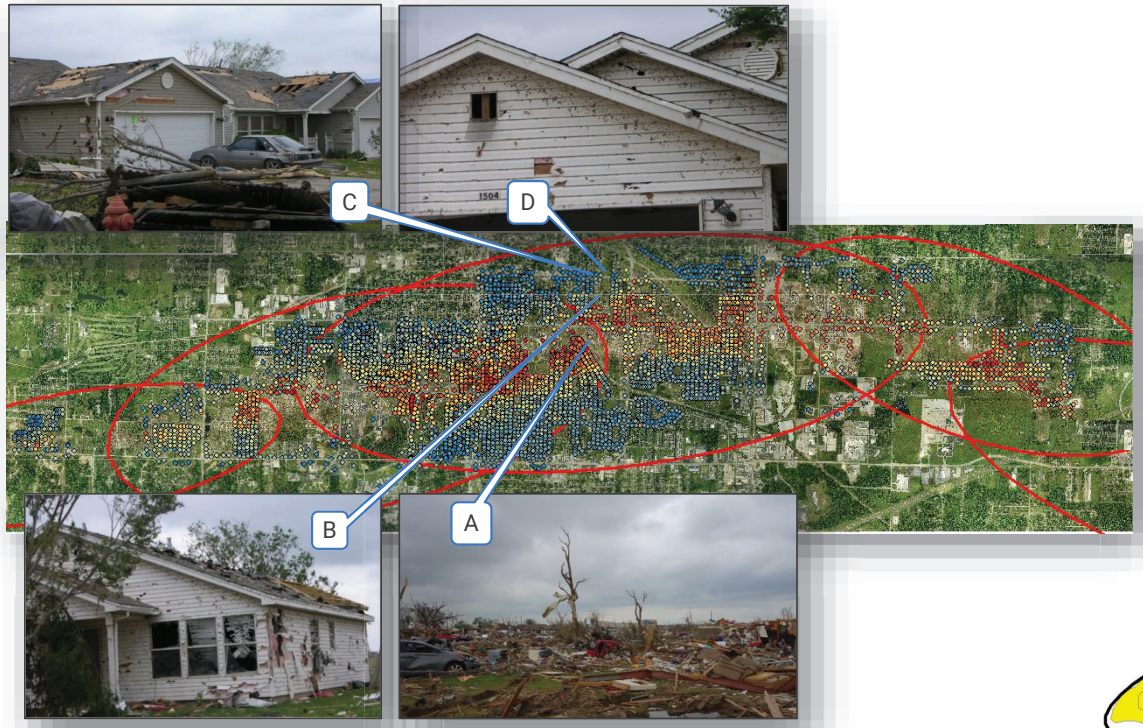
Attributes

Macroevent (outbreak)



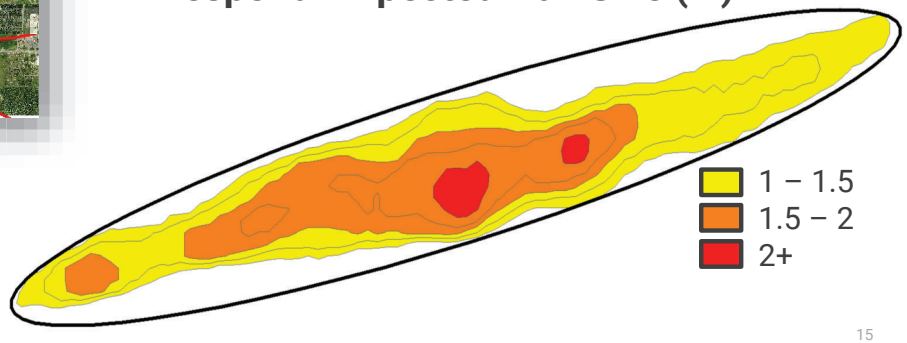
Realistic Hazard Models Are Necessary to Study Impacts of Vulnerability and Mitigation

Tornado Damage Analyzed by TTU and Verisk

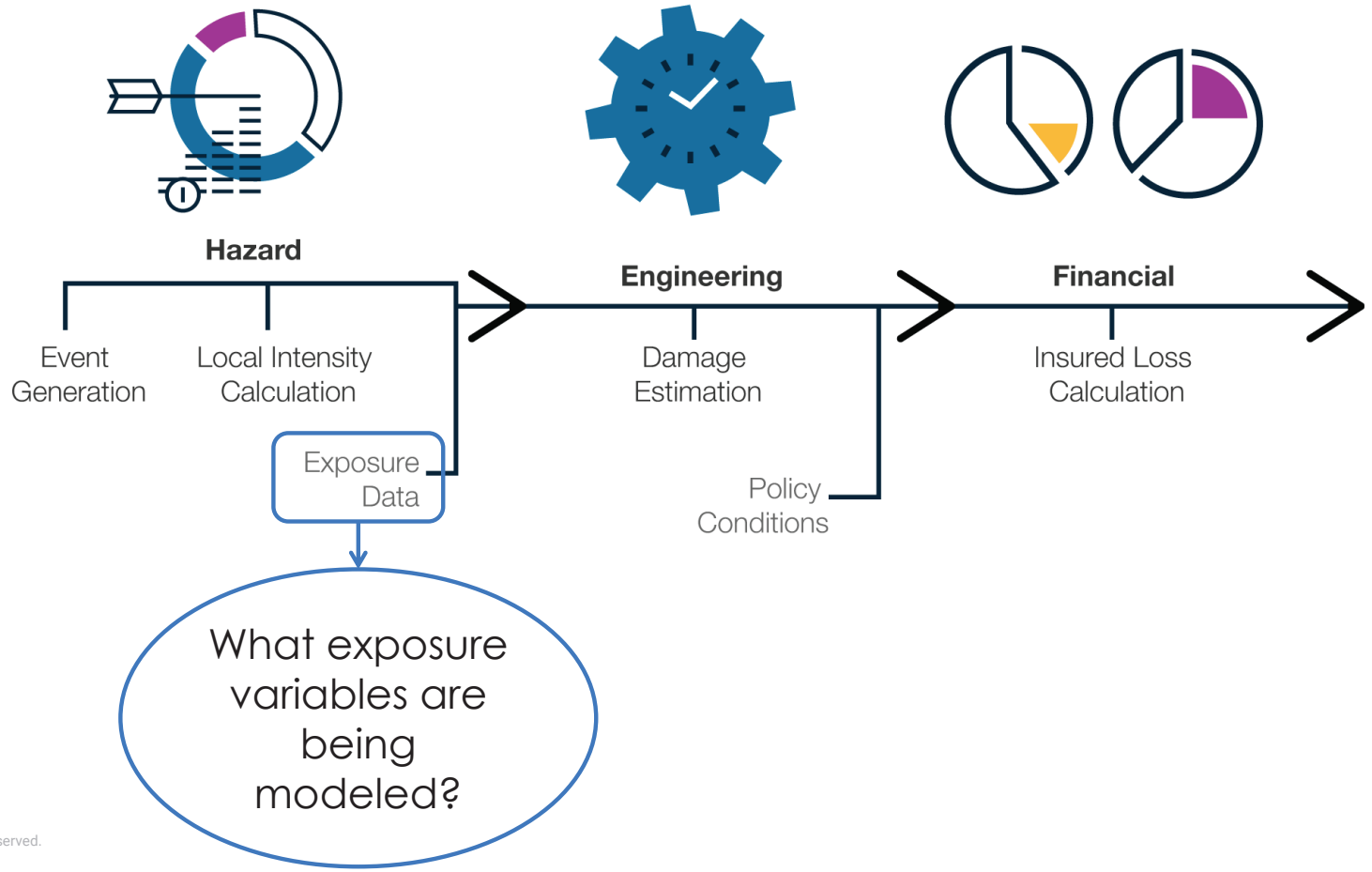


IBHS Field Study

Respond: Expected Hail Size (in)



Hazard Module: Exposure Data Input



How does the User Define their Exposure Data?

Primary Features: Construction, Occupancy, Height, Year Built, Gross Area

Location Information

- Where is the risk located?

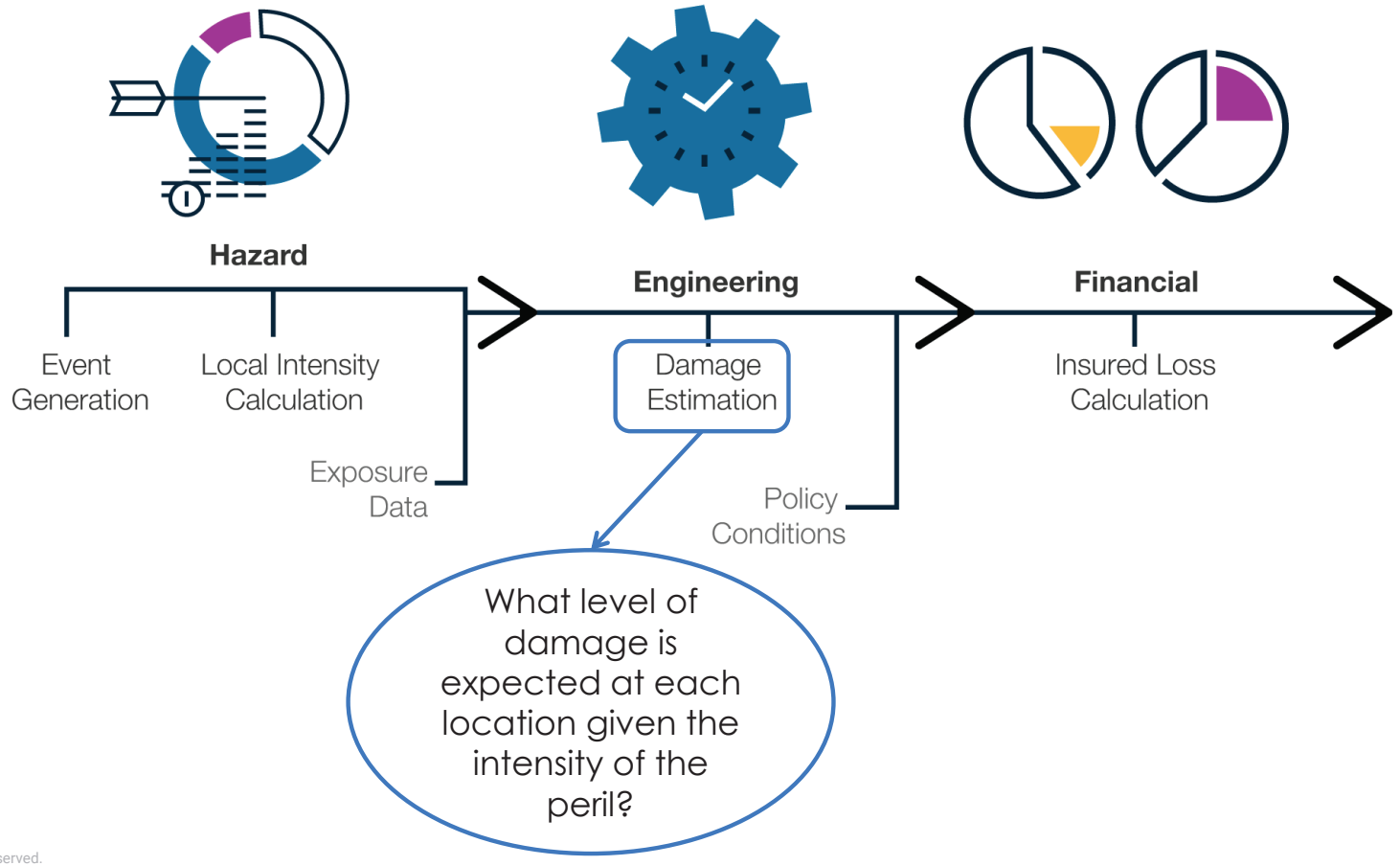
Replacement Values

- How much would it cost to replace irrespective of insurance?

Risk Characteristics

- What is the risk built from?
  What is it used for?
  When was it built?
  How tall is it?

Engineering Module: Damage Estimation



Engineering-Based Data Set Summary

BCEGS Database

Refined Building Code Enforcement Assumptions

Updated Industry Exposure Database

Industry View of Risk

Roof Age Database

Unknown Roof Age Assumptions

Detailed Company Claims

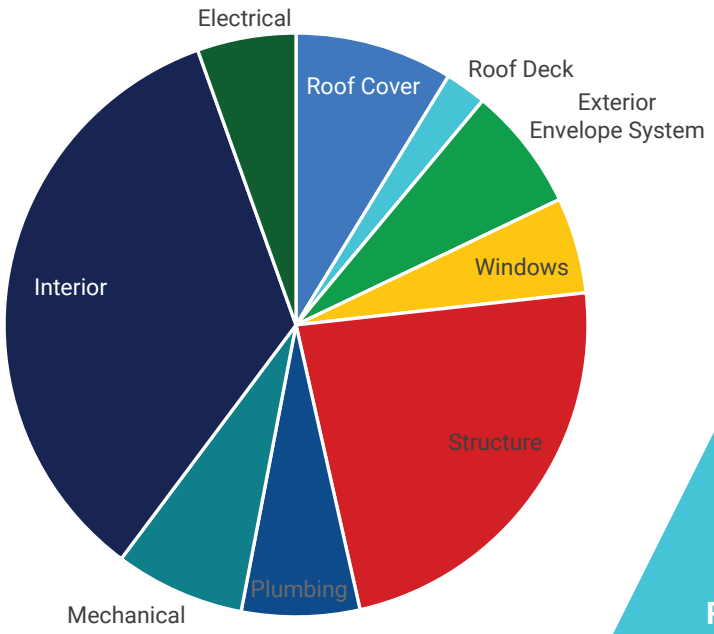
By Coverage, Occupancy, Construction

360Value®

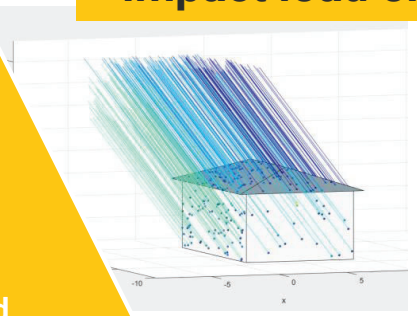
Building Cost Information for Component-Based Hail Framework

Necessary to Appropriately Consider Vulnerability of Individual Components

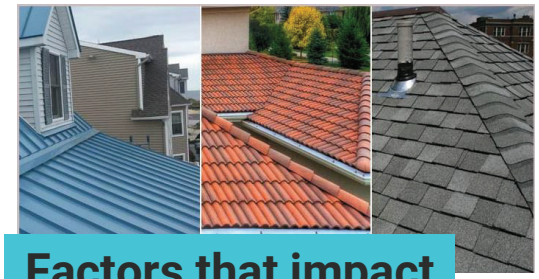
Example Cost Distribution for Residential Structure



Factors that modify hail impact load on buildings



Load Modification



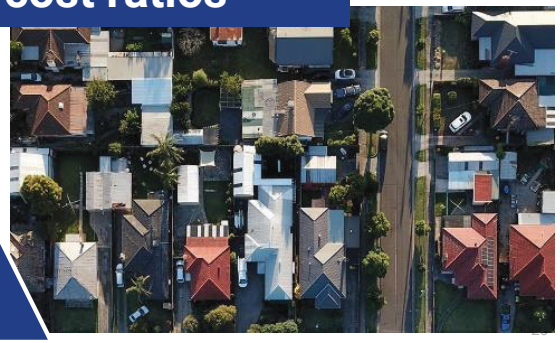
Factors that impact hail resistance

Component Vulnerability

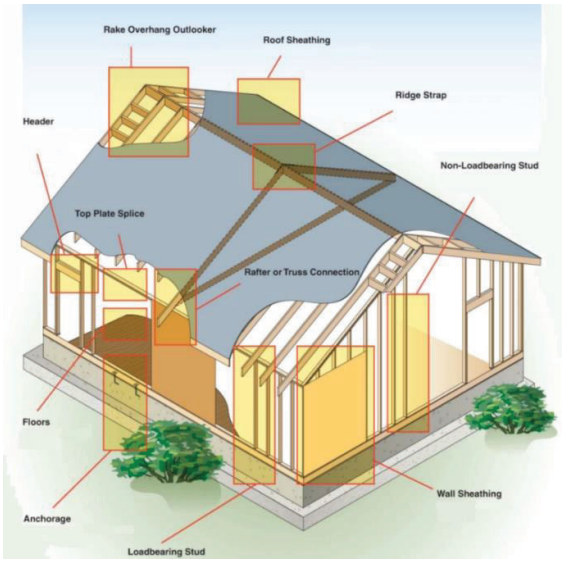
Resistance

Component Cost Ratios

Factors that affect cost ratios



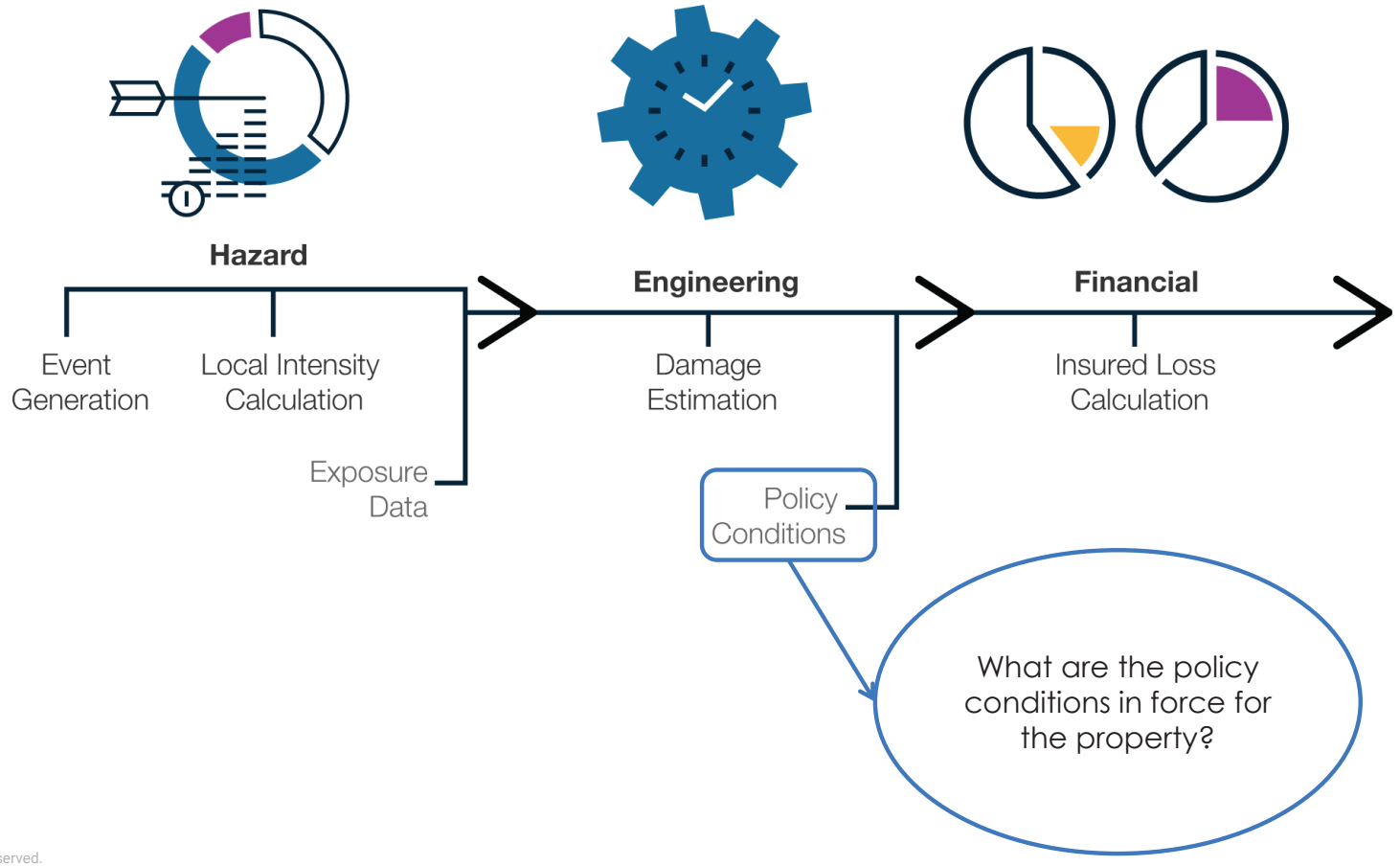
Detailed Description of Primary and Secondary Risk Characteristics Give the Best Representation of Vulnerability



FEATURE	DESCRIPTION
Construction	Wood Frame
Occupancy	Single Family Home
Height	1 story
Year Built	2005
Location	Fort Collins, CO
Roof Geometry	Gable End w/o Bracing
Roof Covering	Hurricane Wind-Rated
Roof Deck	Plywood
Roof Anchorage	Nails/Screws
…	…

Wind Standards → Model Building Codes → State Building Codes → Local Code and Construction Practices → Individual Buildings

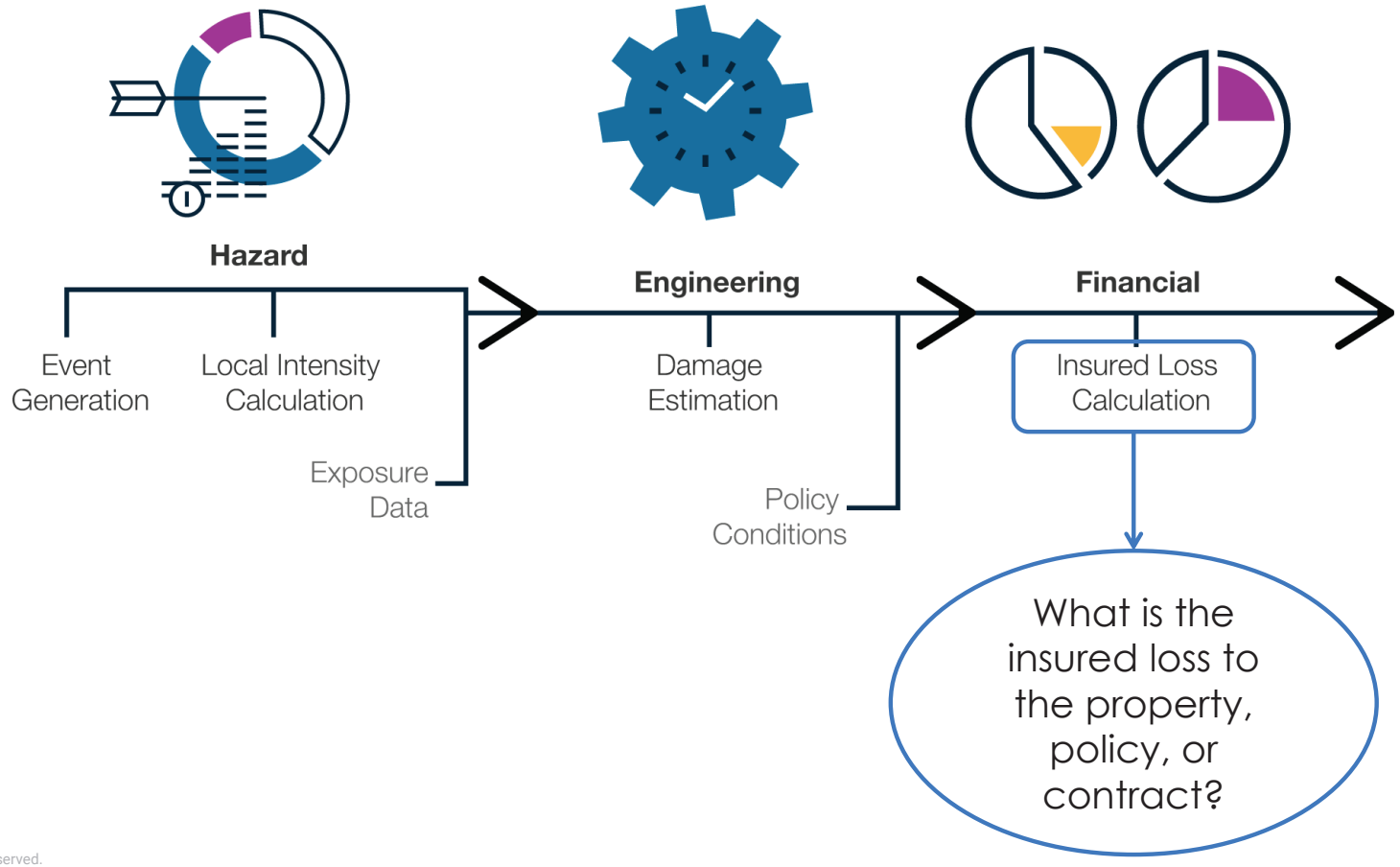
Engineering Module: Policy Conditions



Policy Conditions Dictate Who Pays What

- In Touchstone, users can model the impact of conditions of primary insurer policies and some types of reinsurance contracts
- Common primary policy terms include:
  - Limits
  - Deductibles
  - Participation
  - Many variations on the above

Financial Module: Insured Loss Calculation



Key Model Outputs for Risk Assessment

Average Annual Loss (AAL)

- The loss that can be expected to occur per year, on average, over a period of many years

Exceedance Probability (EP)

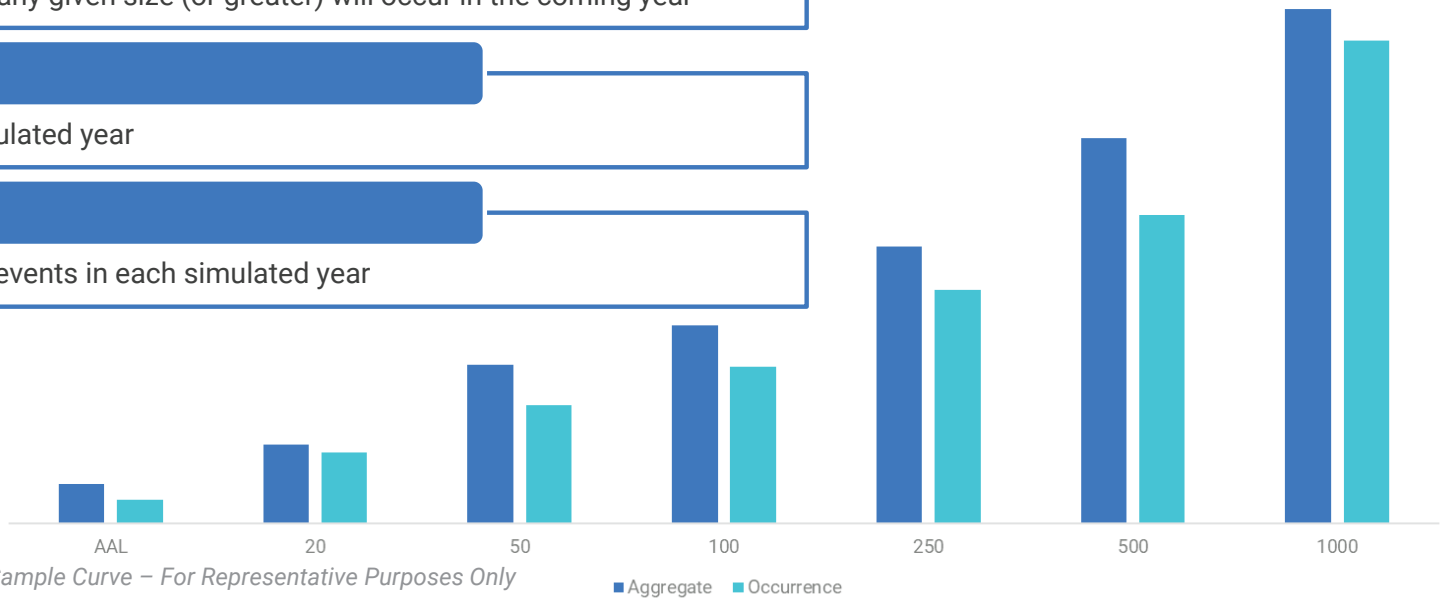
- The likelihood that a loss of any given size (or greater) will occur in the coming year

Occurrence Loss

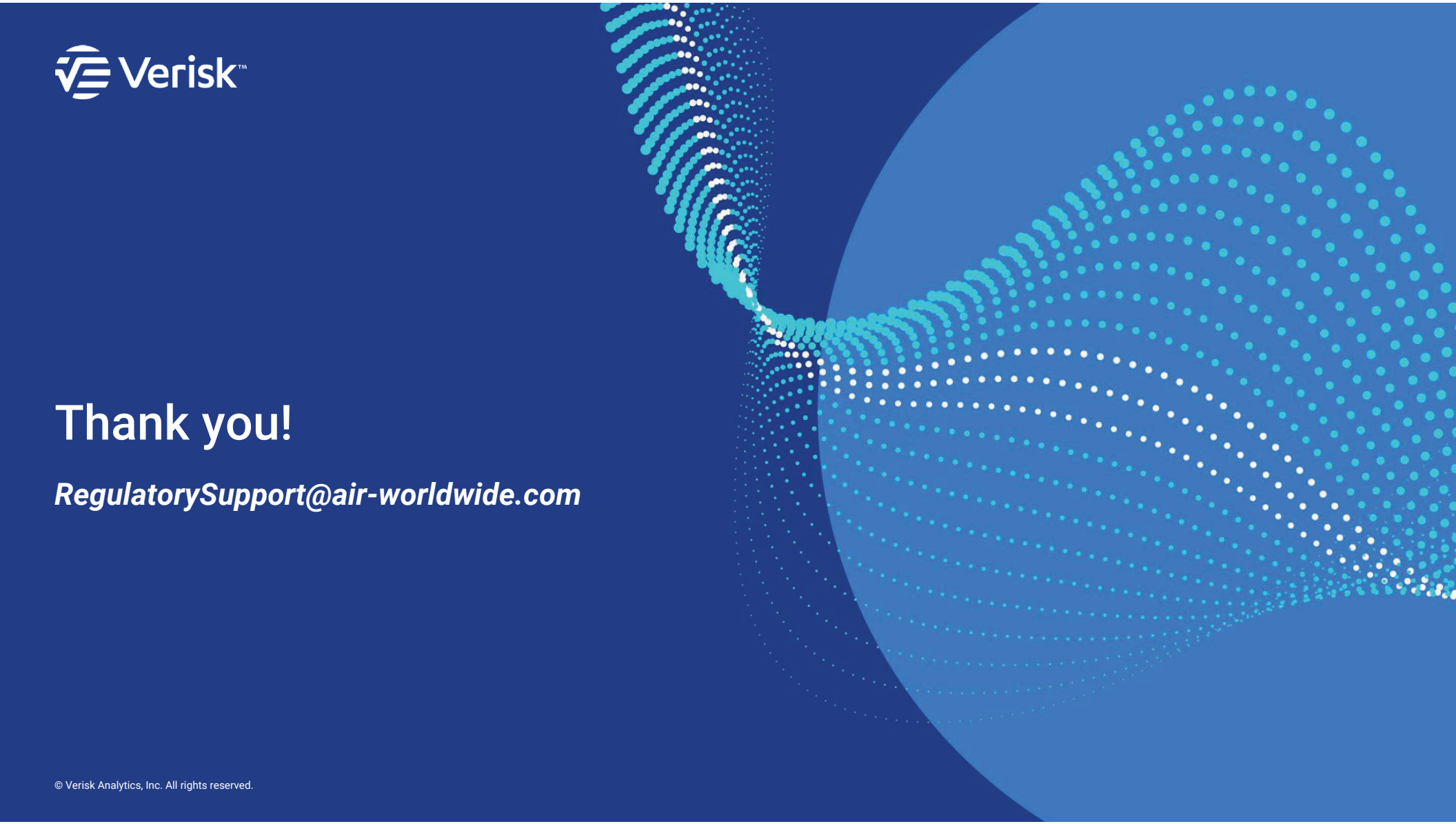
- The largest loss in each simulated year

Aggregate Loss

- The sum of all loss-causing events in each simulated year



Sample Curve – For Representative Purposes Only



Thank you!

RegulatorySupport@air-worldwide.com

National Flood Insurance Program Update

NAIC Property and Casualty Risk-Based Capital (E) Working Group Catastrophe Risk (E) Subgroup

Shana Oppenheim, Sr. Financial Services Policy and Legislative Advisor

July 17, 2023

NAIC NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS

NFIP Review

25 short-term reauthorizations since 2017

last five-year renewal expired

FEMA Risk Rating 2.0

Deadline September 30, 2023

Conflict between:

Shoring up NFIP finances

Ensuring rates better match risk

Avoiding premium spikes that threaten the housing market

On the Ground: Inaccurate Flood Maps Causing Disparity in NFIP Payments?

Florida and Kentucky Hurricanes 2022

Average NFIP payment to Florida households from September 2022 Hurricane Ian - $91,000

Average NFIP payment to Kentucky's July 2022 storm - $49,000

NAIC GOVERNMENT AFFAIRS

What's Floating Around Congress?

Bipartisan & Bicameral *National Flood Insurance Program Reauthorization (NFIP-RE) Act of 2023*

Reauthorize NFIP for five-years and impose changes:

Cap annual premium increase at 9% (down from 18%)

Provide funding for mitigation

Freeze interest payments on NFIP debt

Offer means-tested vouchers to boost flood insurance affordability for low- and middle-income homeowners and renters

Create oversight measures targeting "write-your-own" insurance companies that handle NFIP policies and revamp the claims process

Other Bills (1 of 2)

Senate:

National Flood Insurance Program Consultant Accountability Act of 2023 (S. 1039)

Risk Rating 2.0 Transparency Act (S. 602)

Flood Insurance Affordability Act (S. 601)

Repeatedly Flooded Communities Preparation Act (S. 1417)

Homeowner Flood Insurance Transparency and Protection Act (S. 721)

Other Bills (2 of 2)

House:

National Flood Insurance Program Affordability Act (H.R. 1540)

FAIRNESS in Flood Insurance Act of 2023 (H.R. 634)

National Flood Insurance Program Extension Act of 2023 (H.R. 1392)

Amend the NFIP to Allow for Consideration of Flood Insurance for the Purposes of Applying Continuous Coverage Requirement (H.R. 900)

Require Use of Replacement Cost Value in Determining Premium Rates for Flood Insurance Coverage Under the NFIP (H.R. 1309)

Community Mapping Act (H.R. 1308)

Reading the Tea Leaves

House Financial Services *might* vote in July on a National Flood Insurance Program extension that would decouple the NFIP from its recent cycle of being attached to government funding legislation

Questions

Shana Oppenheim
soppenheim@naic.org

U.S. private flood market

NAIC Property and Casualty Risk-Based Capital (E) Working Group Catastrophe Risk (E) Subgroup

July 18, 2023

Nancy Watkins, FCAS, MAAA

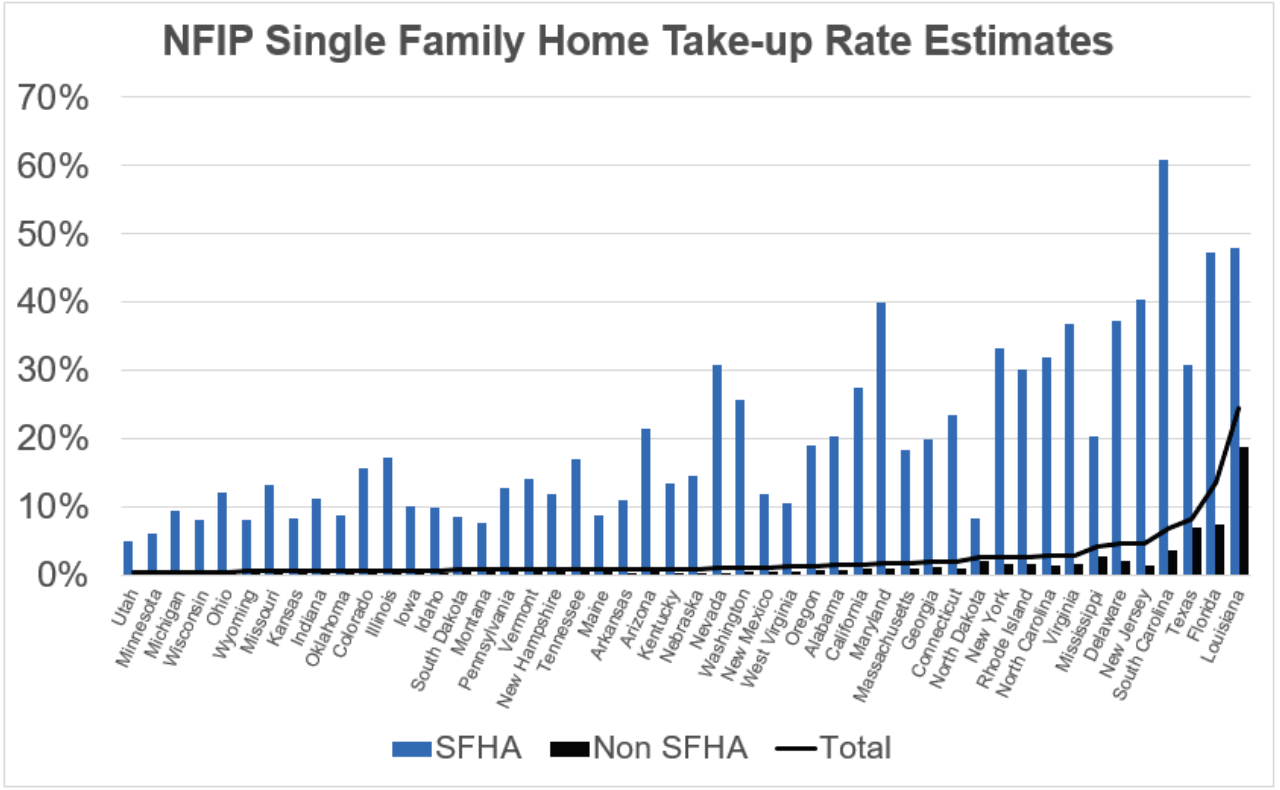
Principal & Consulting Actuary, Milliman

The U.S. flood insurance market is underserved

- Estimated **4%** of SFHs have flood insurance in 2022 (Note 1)
- NFIP: **$3.5B** total premium on **4.7M** total policies as of March 2023 (Note 2)
- Private insurers reported **$1.29B** in total Private Flood DWP in 2022 vs. **$1.03B** in 2021 and **$715M** in 2020 (Note 3)
- Potential U.S. residential flood insurance market between **$41B** and **$52B** of DWP (Note 4)
- 2022 HO DWP was **$132B** (Note 3)

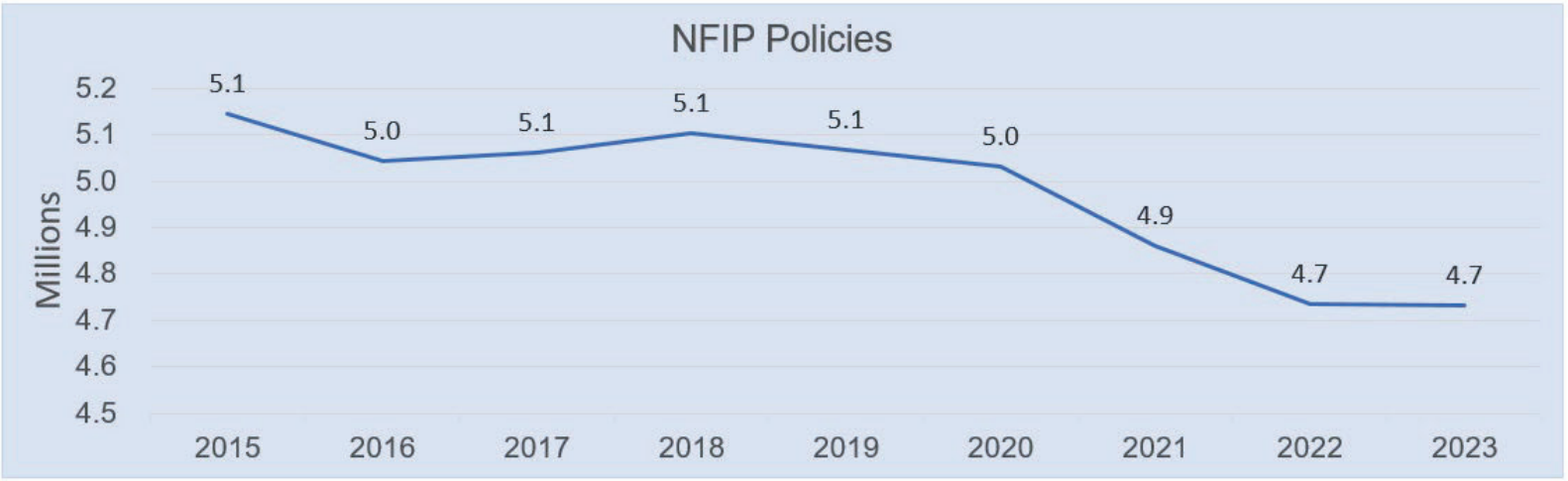
Sources

1. *Milliman analysis of data from OpenFEMA, SNL, US Census*
2. *FEMA Pivot Portal*
3. *NAIC Annual Statement data via SNL*
4. *Milliman analysis*



Sources: OpenFEMA, US Census

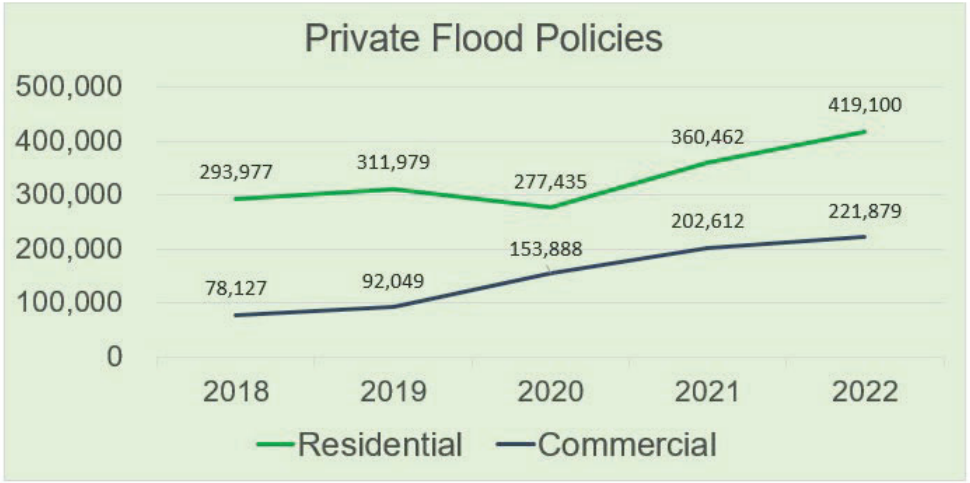
A shift in the market



Sources

NFIP:
Includes all policies (residential + non-residential)
From OpenFEMA (through 2020) and
https://nfipservices.floodsmart.gov/reports-flood-insurance-data
All evaluations at end of year (12/31/XX) except 2023 at 3/31/23

Private flood:
NAIC Annual Statement data via SNL



Private flood market dynamics

- Reinsurance
- Florida developments
  - Hurricane Ian
  - Cat model approvals
  - Citizens mandatory purchase
- Impact of rising flood risk on mortgage and real estate markets
- Strengthening flood risk disclosures

Questions?

nancy.watkins@milliman.com