

Date: 3/8/19

*2019 Spring National Meeting
Orlando, Florida*

CATASTROPHE RISK (E) SUBGROUP

Friday, April 5, 2019

5:00 – 6:30 p.m.

JW Marriott Orlando—Palazzo Ballroom Salon E—Lobby Level

ROLL CALL

Tom Botsko, Chair	Ohio
Robert Ridenour, Vice Chair	Florida
Susan Bernard	California
Mitchell Bronson	Colorado
Susan Gozzo Andrews/Wanchin Chou	Connecticut
Judy Mottar	Illinois
Gordon Hay	Nebraska
Anna Krylova	New Mexico
Gloria Huberman/Sak-man Luk	New York
Andy Schallhorn	Oklahoma
Will Davis	South Carolina
Nicole Elliott/Miriam Fisk	Texas

NAIC Support Staff: Eva Yeung/Jane Barr

AGENDA

1. Consider Adoption of its Feb. 20 Minutes—*Tom Botsko (OH)* Attachment A
2. Hear a Presentation from AIR Worldwide (AIR)—*Brandie Andrews (AIR)* Attachment B
 - a. Overview: Model Introduction, View of Risk and Mitigation Features
 - b. Assumptions and Data: Hazard and Vulnerability
 - c. Key Use Cases: To Understand Some Sensitivities of Model Outputs
3. Hear a Presentation from A.M. Best—*Matthew Mosher (A.M. Best)* Attachment C
 - a. Overview: How Catastrophe Analysis is Incorporated in AM Best's Ratings
 - b. Obstacles: Make Assessing Wildfire Risk Within A.M. Best's Rating Analysis a Difficult Endeavor
 - c. Solutions: How A.M. Best Addresses These Obstacles in its Interactions with Rated Companies
 - d. Market Implications: Market Implications of Recent Wildfire Activity
4. Discuss Any Other Matters Brought Before the Subgroup—*Tom Botsko (OH)*
5. Adjournment

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Draft: 3/6/19

Property and Casualty Risk-Based Capital (E) Working Group and Catastrophe Risk (E) Subgroup
Conference Call
February 20, 2019

The Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met via conference call Feb. 20, 2019, in joint session with the Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force. The following Working Group members participated: Tom Botsko, Chair, and Dale Bruggeman (OH); Richard Ford and Sheila Travis (AL); Giovanni Muzzarelli (CA); Mitchell Bronson (CO); Susan Andrews and Wanchin Chou (CT); Robert Ridenour (FL); Judy Mottar (IL); Anna Krylova (NM); Sakman Luk (NY); Nicole Elliott and Jennifer Wu (TX); and Randy Milquet (WI). The following Subgroup members participated: Tom Botsko, Chair, and Dale Bruggeman (OH); Robert Ridenour, Vice Chair (FL); Giovanni Muzzarelli (CA); Mitchell Bronson (CO); Susan Andrews and Wanchin Chou (CT); Judy Mottar (IL); Anna Krylova (NM); Andy Schallhorn, Donald Ashwood and Joel Sander (OK); and Nicole Elliott, Miriam Fisk and Jennifer Wu (TX). Also participating were: Julie Lederer (MO); and Steven Drutz (WA).

1. Adopted its 2018 Fall National Meeting Minutes

The Working Group and Subgroup met jointly Nov. 16, 2018 and took the following action: 1) adopted its Oct. 11, 2018 minutes; 2) adopted its 2018 working agenda; and 3) adopted proposal 2018-15-CR (2018 U.S. and Non-U.S. Catastrophe Event Lists).

Ms. Mottar made a motion, seconded by Mr. Milquet, to adopt its Nov. 16, 2018, minutes (Attachment Six). The motion passed unanimously.

2. Re-exposed Proposal 2018-16-P (2019 Underwriting Risk Line 4 Factors)

Mr. Botsko said, at the 2018 Fall National Meeting, the Working Group decided to use the 35% capped factors for commercial insurance, medical professional liability, and all other lines. The Working Group also decided to use the uncapped factors for personal lines and reinsurance lines. The proposal was exposed for a 60-day public comment period, and no comments were received during the exposure period.

David Garman (Nationwide) said Nationwide has concerns regarding these proposed factors that may have impacts on some of the run-off companies. He requested that the Working Group re-expose this proposal so Nationwide will be able to come up with alternative options for the run-off companies.

Mr. Luk said 16 companies failed the trend test in 2017 reporting. Ms. Elliott commented that the Working Group will need to discuss whether an adjustment of the factors is necessary, with only a handful of companies impacted by this proposal.

The Working Group and Subgroup agreed to re-expose proposal 2018-16-P for a 30-day public comment period ending March 22.

3. Exposed Proposal 2018-20-P (Asset Concentration PS and Hybrid Labels)

Mr. Botsko said this proposal provides some minor edits to the line descriptions on the PR011 Asset Concentration page. He asked interested parties to provide comments at the Spring National Meeting.

The Working Group and Subgroup agreed to expose proposal 2018-20-P for a 30-day public comment period ending March 22.

4. Exposed Proposal 2019-02-P (Modify RBC Average Growth Risk Calculations)

Mr. Botsko said there are inconsistencies between the current instructions and formula for computation of the selected average growth rate. The instructions state that the selected growth rate is the three-year average growth rate calculated using the four most recent year's gross written premiums. If only the three most recent years of premiums are available, a two-year average growth rate is used. If only the two most recent years of premiums are available, a one-year average growth rate is used. A default 40% growth rate is used for the first year for a startup company. However, the risk-based capital (RBC) formula

indicates that the selected growth rate is the three-year average growth rate if the four most recent year's gross written premiums are available. If the gross written premiums of the four most recent years are not available, a default 40% growth rate is assigned to the first year in which the premiums are available. The selected growth rate is the average of the available growth rates.

Mr. Botsko stated that the proposal lists two possible alternatives to resolve this issue: 1) modifying the formula to match the current instructions; or 2) modifying the instructions to match the current formula. He said having the 40% capped in the first few years was the intent of the calculation for growth. The Working Group members agreed.

The Working Group and Subgroup agreed to expose proposal 2018-20-P to modify the instructions to match the current formula for a 30-day public comment period ending March 22.

5. Heard an Update from the Academy

Lauren Cavanaugh (American Academy of Actuaries—Academy) said the Academy is reviewing data provided by the NAIC. Recommendations related to investment income offsets, premium/loss concentration factors, underwriting investment line 4 factors, growth risk charges and the potential RBC impacts related to the new federal tax law will be submitted to the Working Group in the future.

6. Discussed the Possible Changes of the R3 Related to the Bilateral Agreement

Mr. Botsko said the Reinsurance (E) Task Force is still discussing the possible changes to the Annual Statement Schedule F related to the "Bilateral Agreement Between the United States of America and the European Union on Prudential Measures Regarding Insurance and Reinsurance" (Bilateral Agreement). The Working Group also identified the following changes to the annual financial statement and RBC instructions: 1) eliminating the different treatments of uncollateralized reinsurance recoverable from authorized vs. unauthorized unrated reinsurers; and 2) adjusting the factor for uncollateralized, unrated reinsurers.

Mr. Botsko also stated that, as discussed at the 2018 Fall National Meeting, the information from the Standard & Poor's 500 index (S&P 500) indicates that the actual credit risk associated with the use of an unrated insurer (whether authorized or unauthorized) without collateral is in excess of 30% and possibly as much as 50%. He said phase-in charges over a three or four-year period after the charges are determined should be considered.

Mr. Botsko asked interested parties to monitor the development closely, noting that the Working Group and Subgroup would continue to discuss this item at the Spring National Meeting.

7. Discussed the Factor of Using AEP Basis vs. OEP Basis

Mr. Botsko said the current formula appears to be using the same factor for aggregate exceedance probability (AEP) basis and occurrence exceedance probability (OEP) basis lines. He said the formula should be kept as-is until further study is completed. Mr. Chou suggested that inviting some of the subject-matter experts to present at the national meeting would be a good starting point in reviewing this issue. Mr. Botsko agreed.

8. Discussed Other Matters

Mr. Botsko announced that the Catastrophe Risk (E) Subgroup will have two presentations related to wildfire peril at the Spring National Meeting. He encouraged interested parties to participate in the meeting. Thoughts and comments are welcome after the presentations.

Having no further business, the Property and Casualty Risk-Based Capital (E) Working Group and the Catastrophe Risk (E) Subgroup adjourned.

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The AIR US Wildfire Model

NAIC Spring Meeting 2019

April 5, 2019

Brandie Andrews, CEEM

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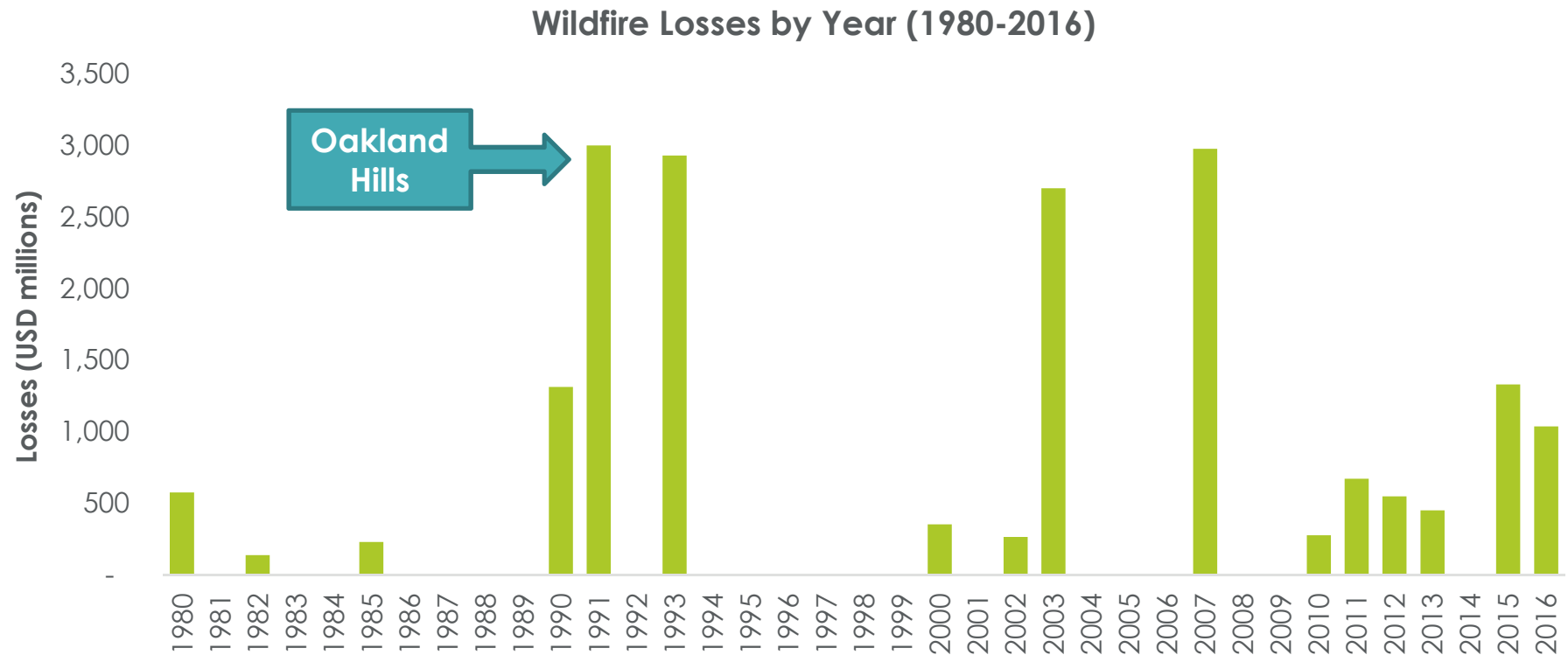
Agenda

Model Overview

- Historical losses
- AIR model assumptions
- Mitigation features

Modeled Losses

Historical Loss Experience Doesn't Tell the Whole Story



Source: AIR, PCS, Swiss Re, Munich Re, Aon (trended)

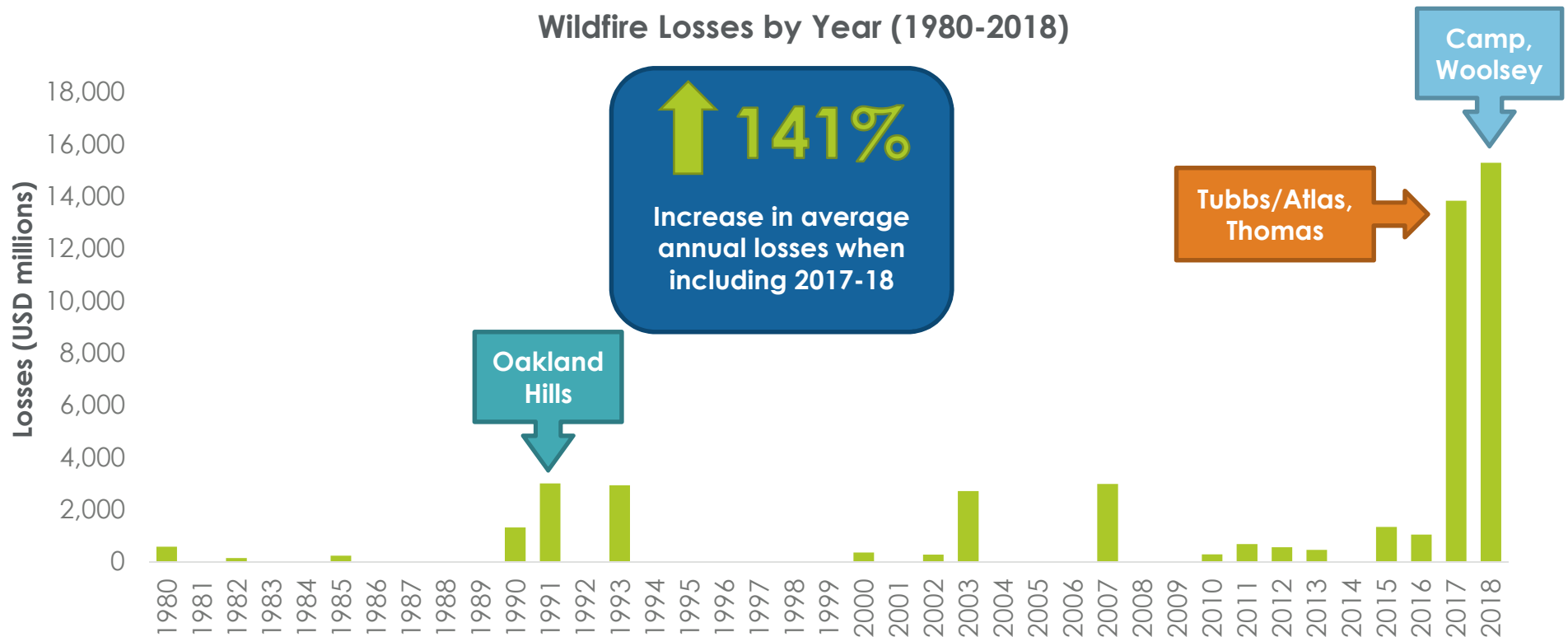
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Historical Loss Experience Doesn't Tell the Whole Story

Wildfire Losses by Year (1980-2018)



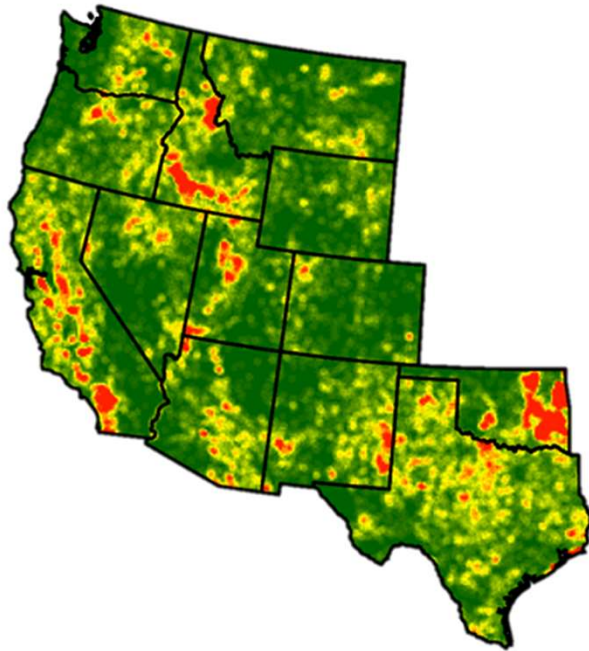
Source: AIR, PCS, Swiss Re, Munich Re, Aon (trended)

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AIR Model Domain



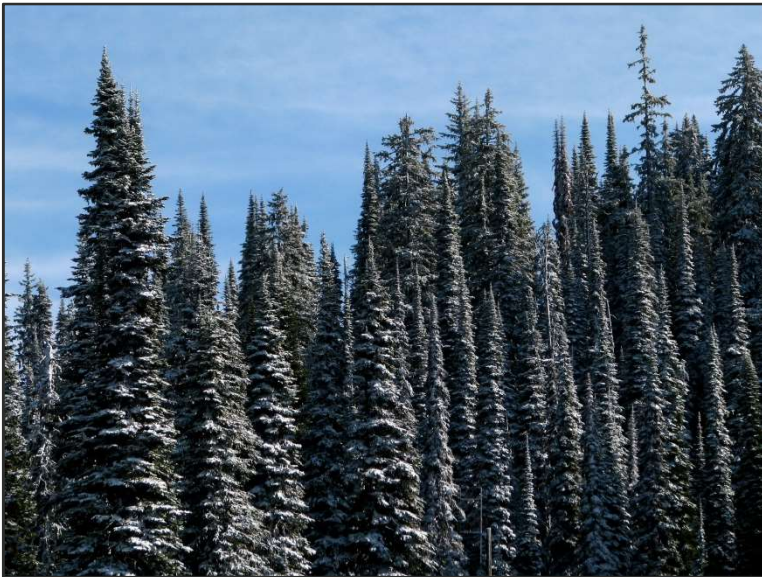
Historical Ignitions ≥ 100 Acres (1992–2015)

Includes the Top Loss-Causing States:

California
Texas
Colorado
Arizona
Idaho
Washington
Oklahoma
Oregon
Utah
Montana
New Mexico
Nevada
Wyoming

Wildfire Activity Is Modelled on the Ecoprovince Level

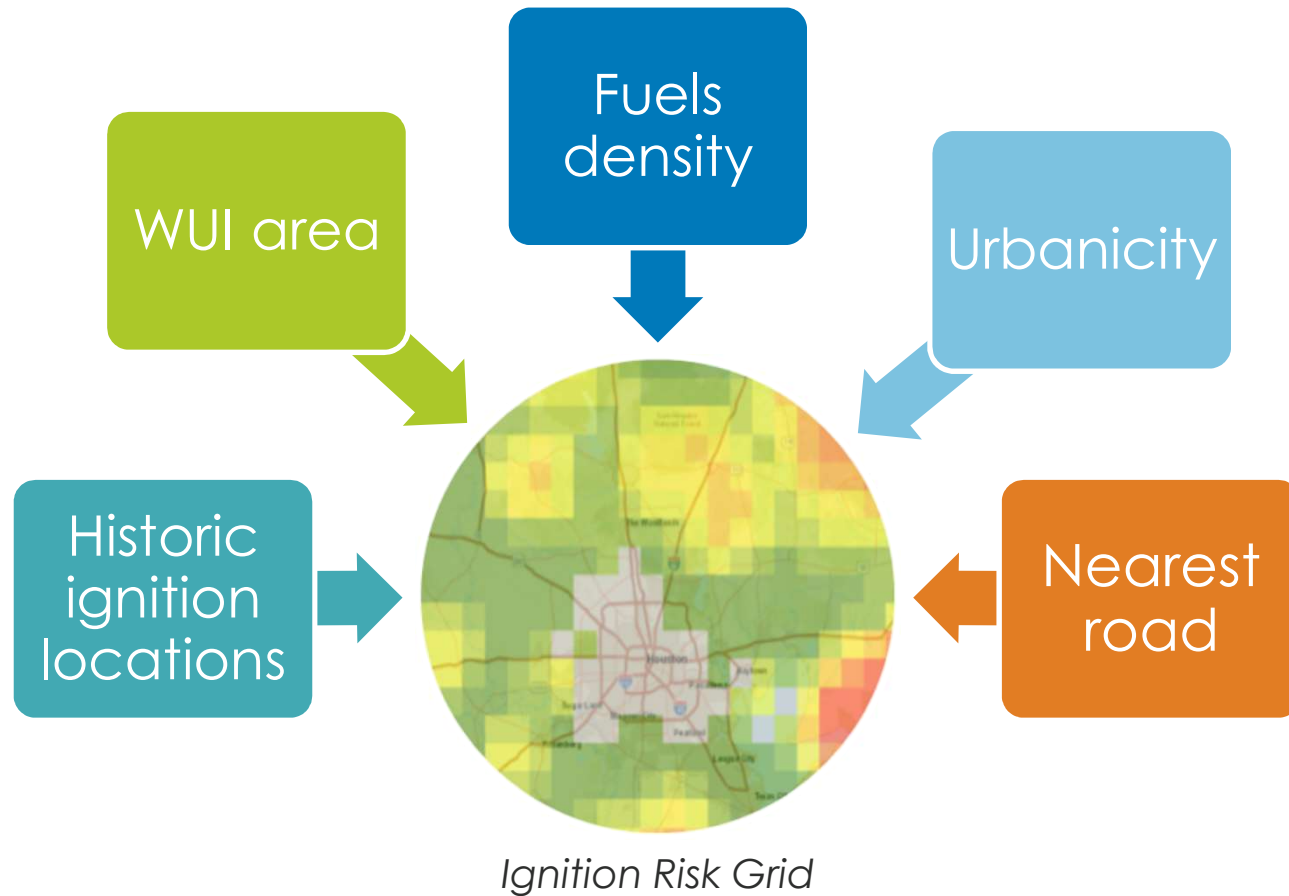
Northern Rocky Mountain Forest-Steppe
• Coniferous Forest



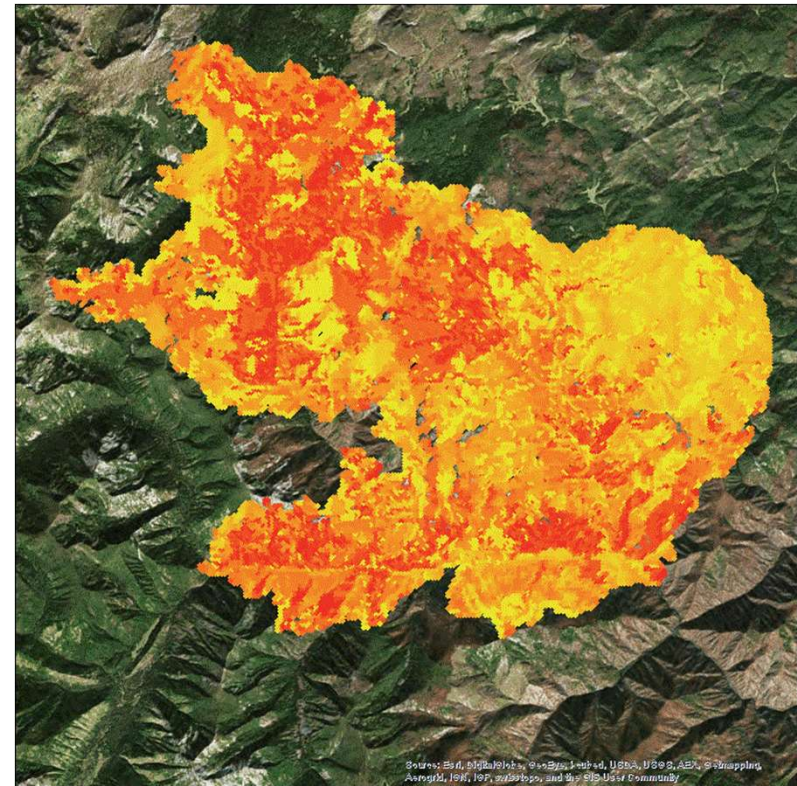
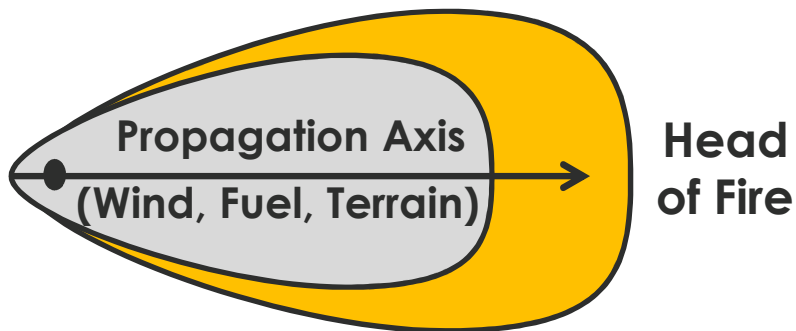
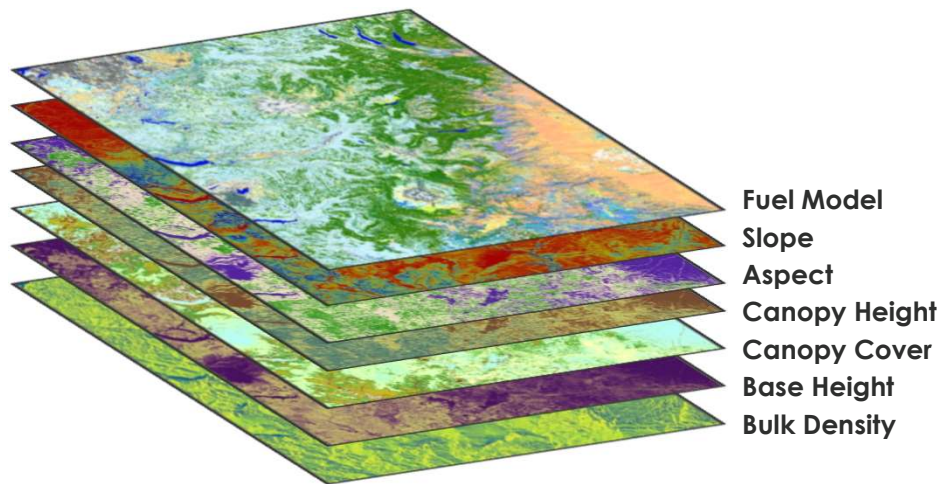
Ecoprovinces identify regions with similar ecosystems, climate, and vegetation—key drivers for fire behavior

AIR models weather patterns to maintain natural variability of risk

Capturing Ignition Location Factors and Likelihood to Burn



AIR's Physically-Based Model Realistically Captures Fire Spread Across a Landscape



Spread Model Explicitly Accounts for All the Ways a Fire Can Spread

- Surface Spread
- Surface-to-Canopy Transition
- Canopy Spread
- Fire Branding/Spotting



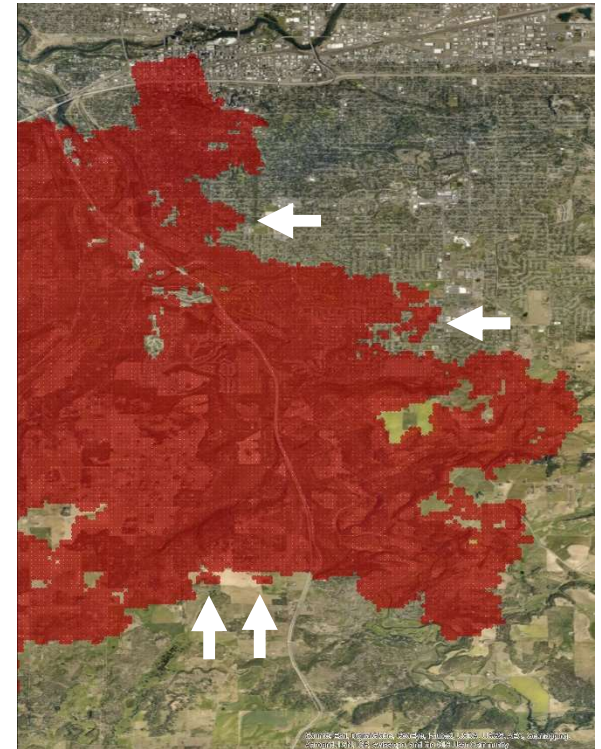
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Embers Spread Wildfire to Urban Areas

- Embers, created as materials within the fire perimeter, are thrown ahead of the main fire front
- Embers allow fires to cross roads, rivers, and other natural fire breaks
- Most structures are ignited as embers collect on and around them

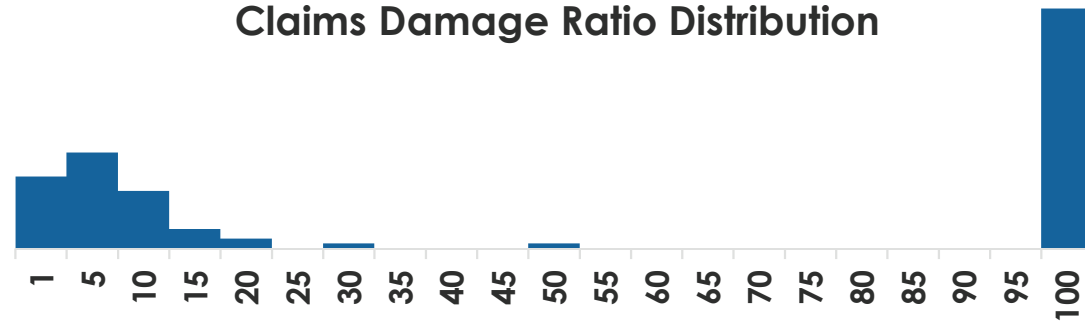


Binary Damage Pattern Revealed by Damage Survey and Claims Data



Source: AIR Damage Survey (Tubbs Fire, 2017)

Claims Damage Ratio Distribution

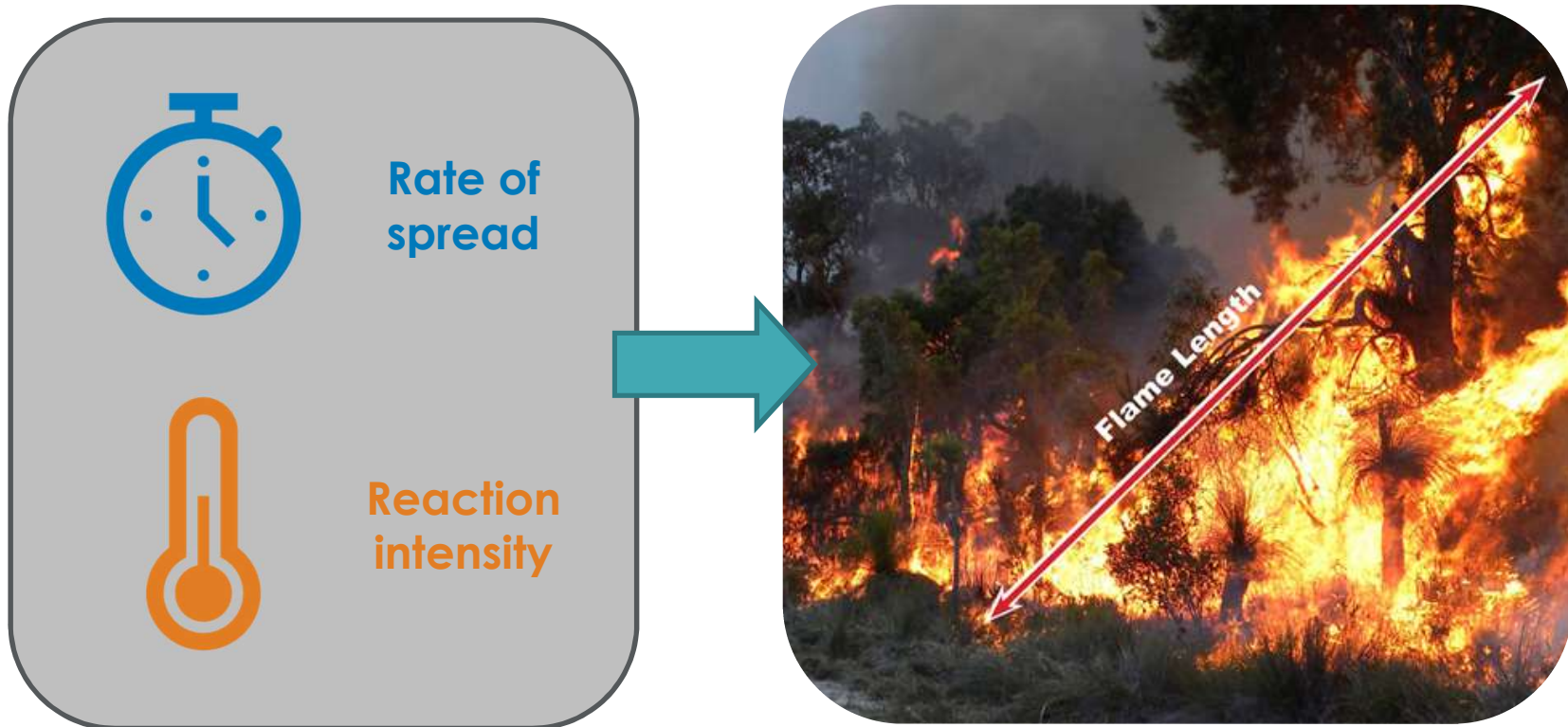


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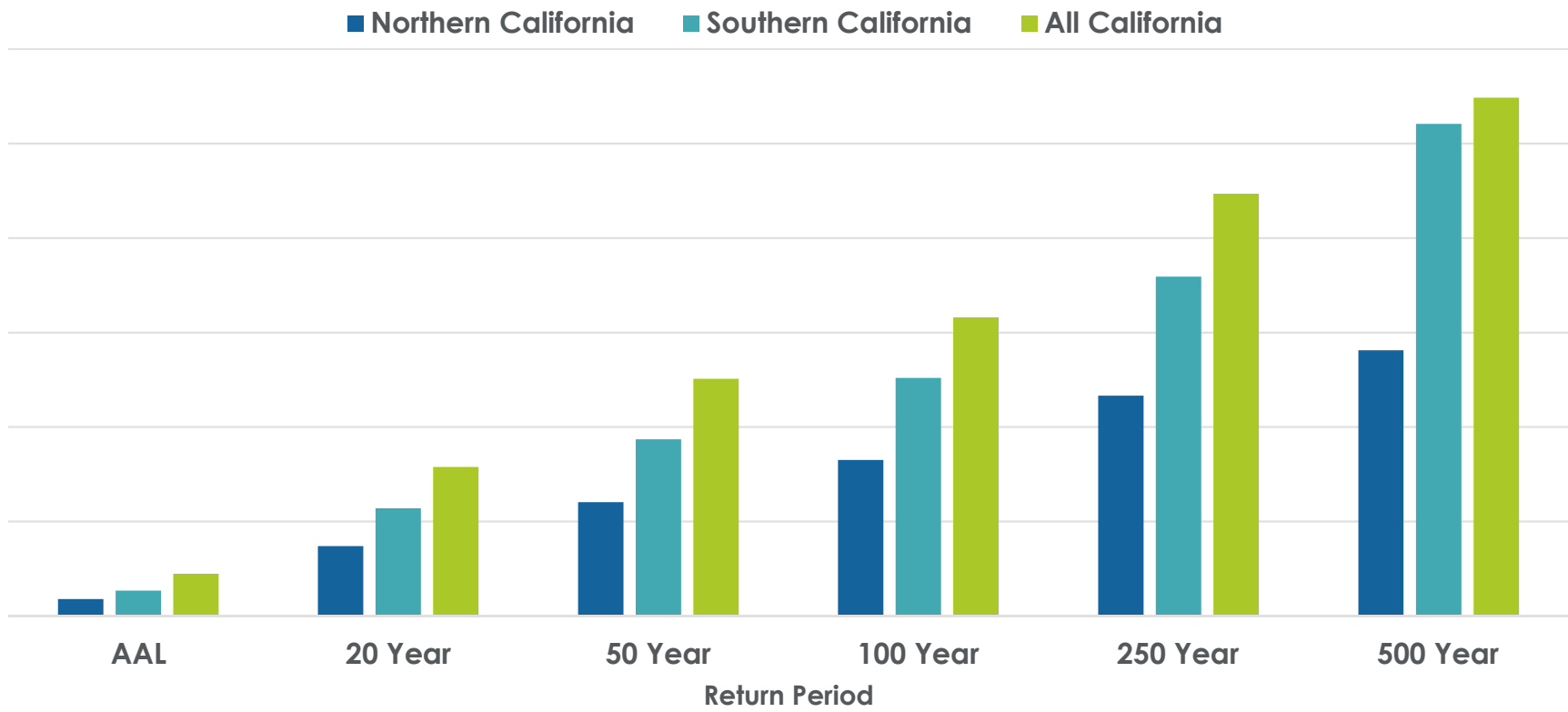
Building Damage Is Estimated Based on Flame Length



Model Allows for Capture of Important Mitigation Features

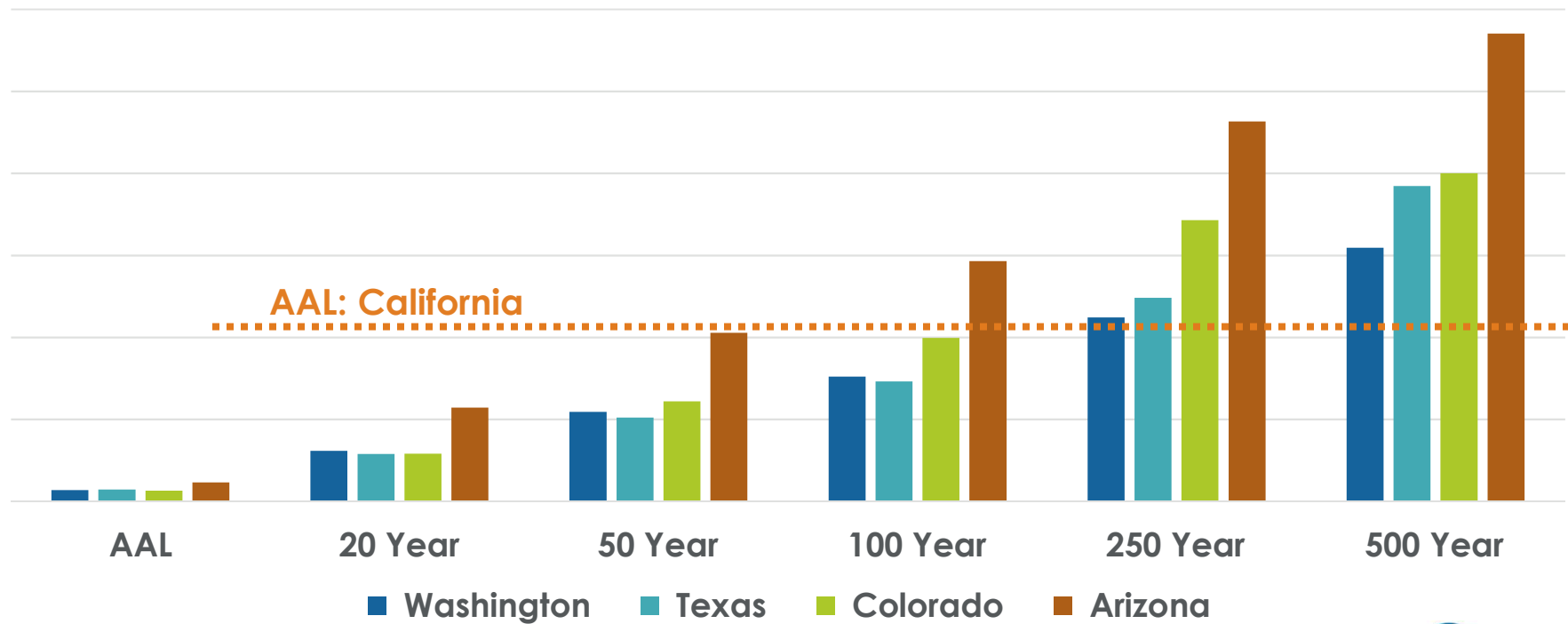
Property Level	Community Level
<div data-bbox="220 581 789 841" data-label="Image"> </div> <div data-bbox="399 844 602 893" data-label="Caption"> <p>Roof Type</p> </div> <div data-bbox="993 581 1251 841" data-label="Image"> </div> <div data-bbox="1050 844 1180 893" data-label="Caption"> <p>Siding</p> </div> <div data-bbox="144 904 865 1166" data-label="Image"> </div> <div data-bbox="298 1169 703 1218" data-label="Caption"> <p>Skylight and Dormer</p> </div> <div data-bbox="949 904 1320 1166" data-label="Image"> </div> <div data-bbox="959 1169 1312 1218" data-label="Caption"> <p>Defensible Space</p> </div>	<div data-bbox="1539 743 1659 867" data-label="Image"> </div> <div data-bbox="1692 743 1806 867" data-label="Image"> </div> <div data-bbox="1453 904 1913 1002" data-label="Text"> <p>FIREWISE USA™ Residents reducing wildfire risks</p> </div>

Model Losses - California Return Periods (All LOB)

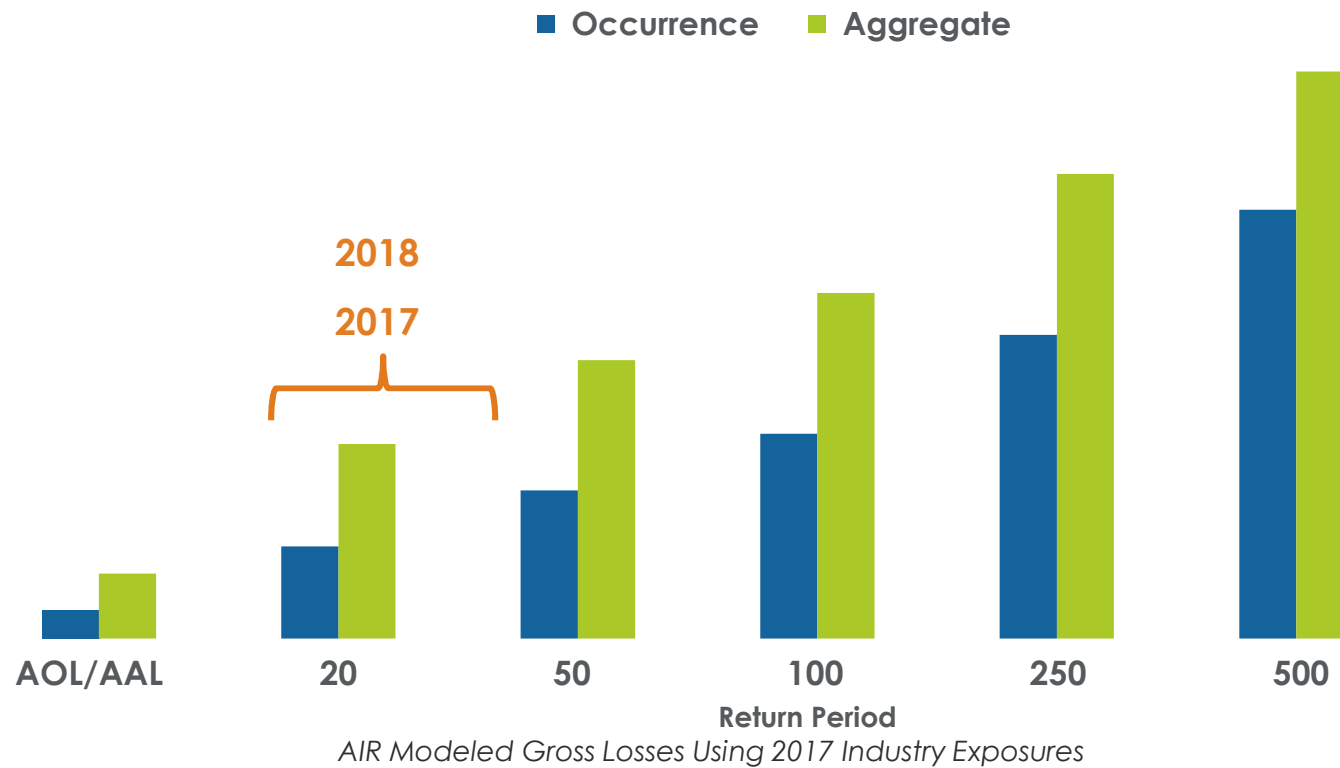


Top Expanded States Return Periods (All LOB)

20 Year RP: California



2017 and 2018 as Reflected on the Aggregate EP Curve



Summary – AIR Wildfire Model for the U.S.

- Includes the top loss-causing states
- Is a physically based spread model that considers wind speed and direction, slope, fuel and topography
- Accounts for all the ways a fire can spread
- Captures spatial impacts of climate, ecology; and temporal impacts of weather throughout the year
- Can model mitigation incentives, which can significantly impact losses
- Realistically captures fire spread into urban areas and explicitly accounts for suppression efforts



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AM Best Comments on Wildfire Risk

**NAIC Spring 2019 Meeting
Catastrophe Risk (E) Subgroup**

Matt Mosher, Chief Operating Officer

Agenda

Catastrophe Analysis in AM Best Ratings

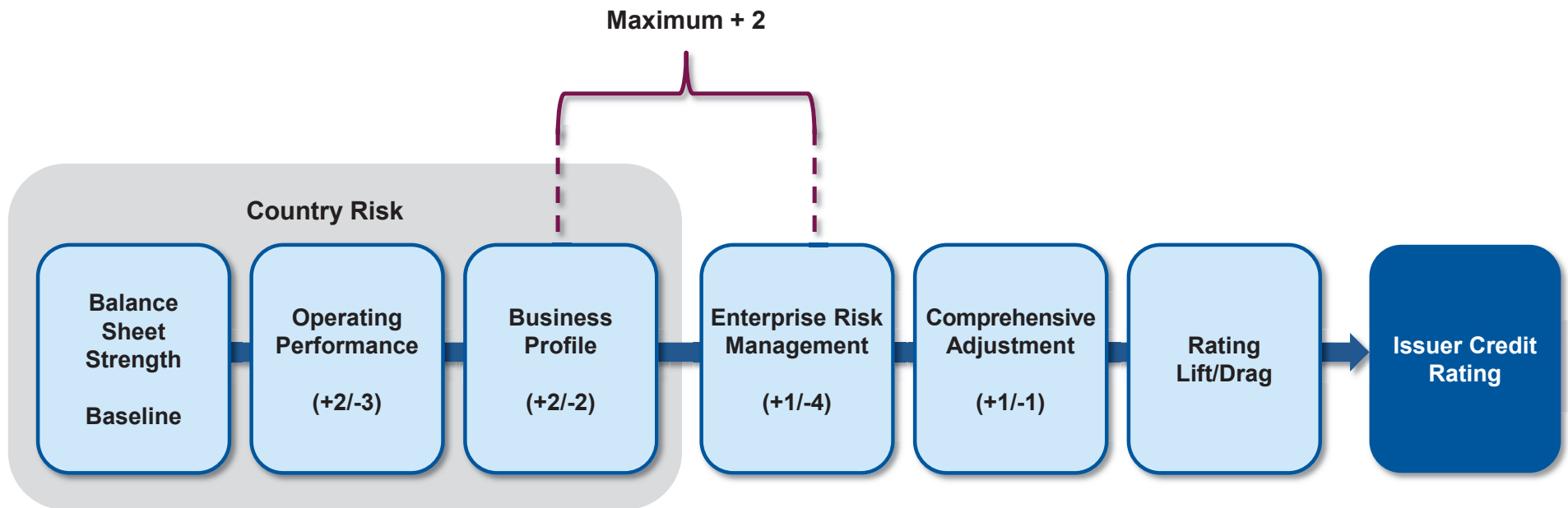
Assessing Wildfire Risk Within Rating Analysis

- Difficulties
- Discussions with management
- Models
- Recent Rating Actions

Market Implications



BCRM: Best's Credit Rating Methodology



Catastrophe Analysis in AM Best Ratings

Enterprise Risk Management

- Stress Testing
- Catastrophe Modeling
- Data Quality
- Aggregate Loss Exposure
- Monitoring

Balance Sheet Strength

- Capital Requirement for Potential Cat Losses in Standard BCAR
 - Net PML for each confidence level is per-occurrence all-perils combined
 - Pre-tax net PMLs are net of reinsurance & include reinstatement premiums
- Catastrophe-Related Stress Test on Capitalization
 - Financial Flexibility
 - Exposure to Multiple Events in a Season

Assessing Wildfire Risk – Difficulties

**Hurricanes & Earthquakes
have historically been
largest perils**

- Wildfire viewed as
secondary peril

**Probabilistic
modeling in infancy
stage**

**Insurers own loss
data insufficient to
quantify today's risk**

Climate

**Regulatory
Restrictions**

Assessing Wildfire Risk – Discussions with Management

Risk tolerances

Reinsurance structure

How management becomes comfortable with wildfire risk?

- Go beyond model output of a cat model, or average of several cat models
- Include a thoughtful process to determine a rating units potential losses
- Want management's view of risk

Mitigation efforts

- Rescoring of entire wildfire exposed books
- New business moratoriums / Non-renewals
- Incorporate underwriting/claims lessons
- Fire Protection & Defense Experts

Assessing Wildfire Risk – Models

Hazard Analysis

- FireLine / RMS / Corelogic / Broker products
- Point of Sale underwriting tools

Probabilistic Analysis

- Corelogic / AIR / New RMS Model
- Historical versus Modeled AAL

Exposure Accumulation Tools

- Heat Maps
- Consistency in size – as opposed to zip codes or counties
- Deterministic Modeling

Assessing Wildfire Risk – Rating Actions

Vast majority of companies absorbed 2017 & 2018 losses without impact to ratings

- Gross losses were below state-wide market share modeled estimates
- Reinsurance responded appropriately

Micro-concentration of risks led to a few negative rating actions

- Modeled output does not reflect the concentration of risk
- Timing and quality of data in the model
- Lack of reliable modeled output

Market Implications

Additional Focus on Exposure Aggregation Tools & Analysis

Loss-affected accounts has/will result in higher reinsurance rates

Non-renewal activity will continue to increase

- E&S / FAIR Plan implications

Carriers seeking out other avenues & partners for analysis

- Smaller, concentrated companies could be adversely selected against

Regulatory actions/constraints

- Contents
- Non-renewal restrictions
- Mudslides

Insurability Issues





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