By-Peril Rating for Homeowners

Ratemaking and Product Management Seminar, March 2013

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Outline

- Modeling/Rating Options
- Why Rate By Peril?
- Peril Groupings
- Variable Selection
- Model Validation
- Territory Options
- Implementation Considerations






Modeling Options

Combined Peril Modeling and Rating

- Simplest to model and implement
- May be appropriate choice for regional carriers

By Peril Modeling with Single Peril Rating

- Average the by peril factors for implementation
- Use when existing systems can't incorporate multiple perils

By Peril Modeling and Rating

- Most accurate and intuitive method
- Requires most resources to implement and maintain

Greater Accuracy AND Complexity

Why Rate By Peril?

- Example 1:
  - 10% sprinkler credit applied to total policy premium
  - Inland: $1000 policy premium, $300 of it related to fire losses
  - Coastal: $2000 policy premium, $300 of it related to fire losses
  - Higher wind premium on coast leads to larger dollar sprinkler credit
- Example 2:
  - Burglar alarm provides smaller dollar savings for hail-resistant roofs

Rating by Peril Increases Accuracy

Peril Groupings

Potential Perils	
Non-Catastrophe	Catastrophe
• Fire • Water – Weather – Non-Weather • Theft – On Premises – Off Premises • Wind • Hail • Liability • Other	• Hurricane • Severe Thunderstorm • Winter Storm • Earthquake • Fire Following EQ • Wildfire

- **Base Perils On**
  - Available Data Breakouts
  - Non-cat Claims & Losses
  - Cat AALs

Fire

Water (Weather)

Water (Non-Weather)

Theft

Wind/Hail

Liability

Other Perils

Hurricane

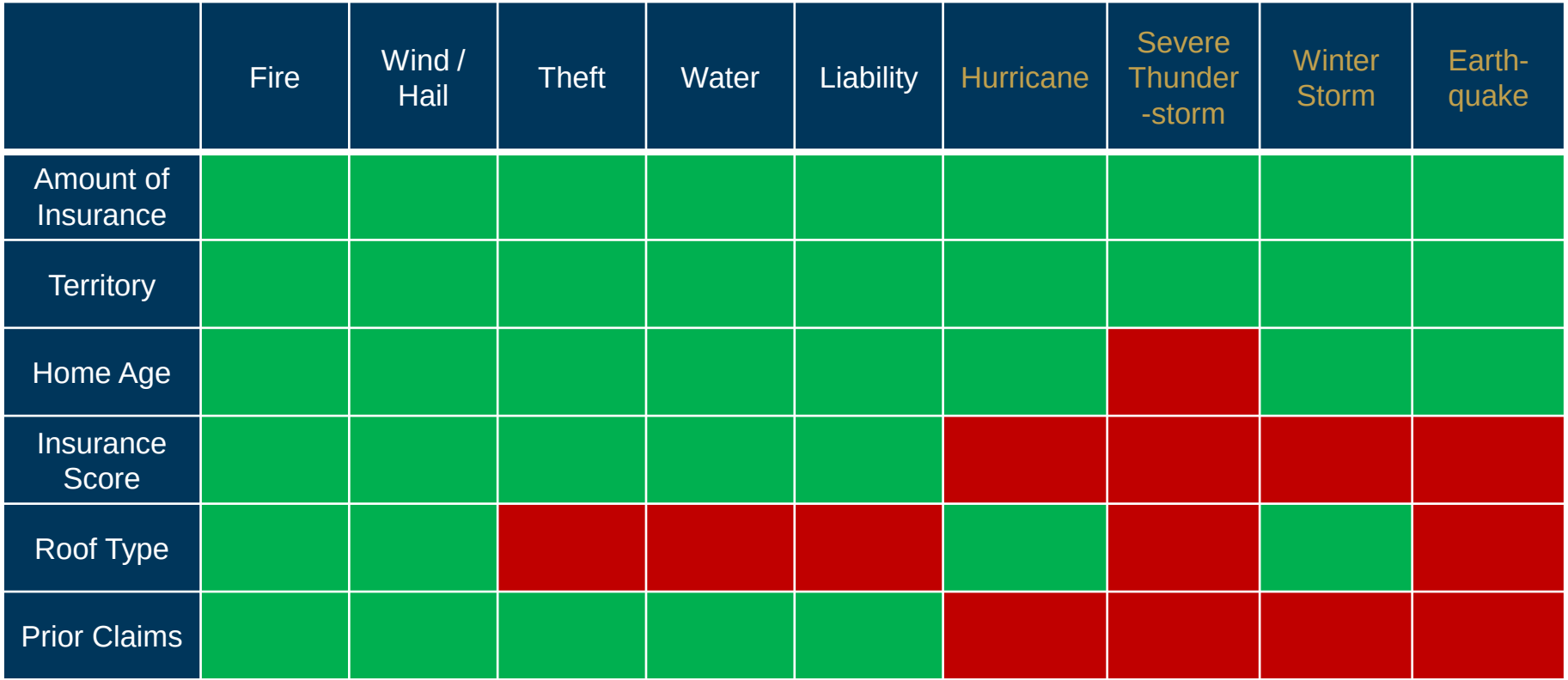
Severe Thunderstorm

Earthquake

Variable Selection

- Same as single peril modeling
  - Statistical tests
  - Consistency over time
- New information about loss drivers
  - ex. Dwelling coverage amount is predictive of liability losses
  - ex. Insured age is predictive of wind/hail losses
  - ex. Weather is predictive of theft losses

Variable Selection

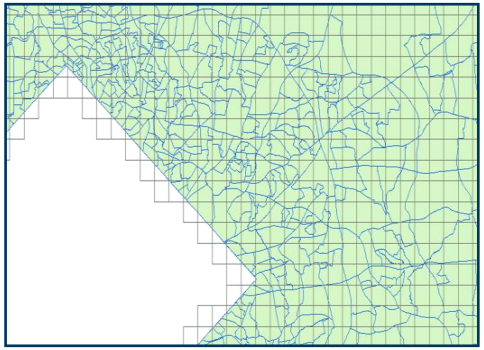


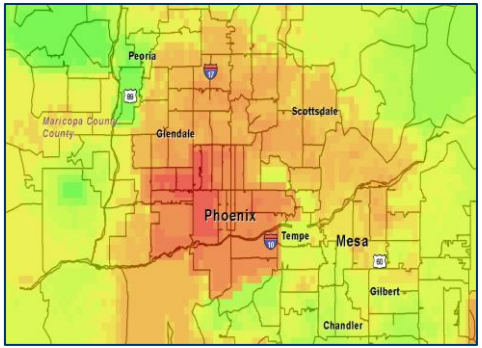
Model Validation

- Same methods as with single peril model
- More perils = less data in validation sample too
- Splitting Entire Dataset (In Time Validation Sample)
    - Pro: Not impacted by changes in data quality over time
    - Con: Same weather events impact training and validation samples
- Out Of Time Validation Sample
    - Pro: Not impacted by same weather events
    - Con: Affected by changes in data quality over time

Territory Options

- Different territories by peril
- Same territories by peril, different relativities
    - ZIP codes, grid squares, census geography
- Geographic risk scores
    - Incorporate weather, crime, demographics, etc
- Spatial Smoothing
    - Splitting data lowers volume
    - Increased territory refinement lowers volume





Implementation Considerations

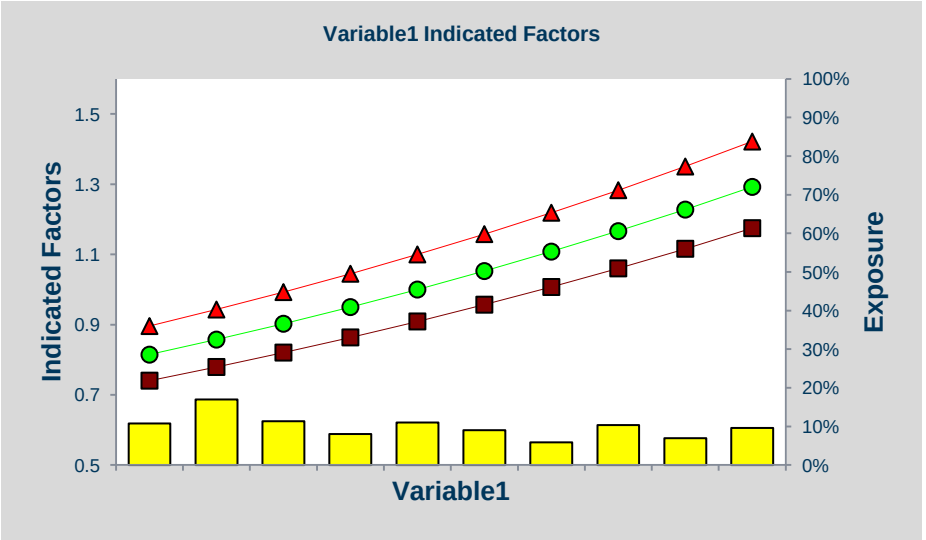
- Explainability
- State Exceptions
  - Restrictions on individual variables
  - Catastrophe models / Weather Perils / State Data Only
- Unit-Owners & Tenants – Low Volume
  - Use Owners Factors?
- Prior Claims Surcharges
  - Surcharge only claims from same peril or from others too

Implementation Considerations (cont.)

- Cat models don't use all variables
  - ex. Tier, Roof Type
- Cat model credibility
  - Consider individual territories fully credible? With how many PIF?
- Same/different perils by state
  - Consistency vs complexity
- Tier
  - Different tiers by peril
  - Same tier for all perils, but different factors

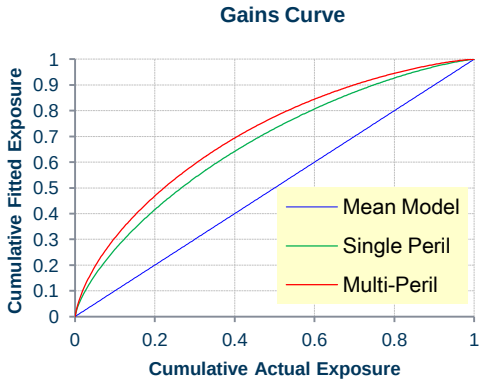
Implementation Considerations (cont.)

- Impact on policyholders
  - Renewal rate capping
  - Implement in new company for new business only
- Factor Selection
  - All at once or step into it
    - Confidence intervals



Wrap-up

- Rating by peril is more accurate than combined peril rating
- Peril groupings will depend on loss volume and claims coding
- Several territory options available
- Other implementation considerations to think about



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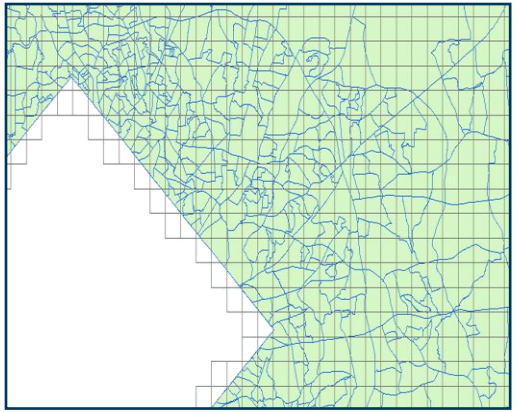

Questions?