Dive In!
The NC Private Flood Program

CAS RPM Presentation – March 16, 2021

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Polling Question: Flood Insurance

Which group is most important for increasing flood insurance awareness?

- Realtors
- Consumers
- Insurance Agents
- Governmental Entities
- Insurance Companies
The NFIP: North Carolina Results

- **9th**: North Carolina’s ranking nationally in SFH exposure to flood damage

- **112,000**: Number of SFH NFIP policies in North Carolina, compared to 3.5M countrywide

- **$24,500,000,000**: Total amount of losses from Hurricanes Matthew and Florence combined
  - Of that, $10-13 billion were uninsured flood losses from Hurricane Florence

- **13%**: Percentage of countrywide flood losses that are uninsured by the NFIP, as estimated by Milliman
Who is NCRB?
The Bureau shall promulgate and propose rates for insurance against loss to residential real property with not more than four housing units.

Every insurer shall adhere to the uniform classification plan, experience rating plan, and policy form.

The DOI shall be authorized to take appropriate action to plan for and establish a private flood insurance market.

NCGS 58-36-1

NCGS 58-36-100(o)

2016- HB287
NCRB Flood Timeline

- Mar 2017: NCRB Established Flood Committee
- Dec 2017: NCRB Established Flood Committee
- Apr 2018: Goal and Program Structure
- Aug 2019: Rating Plan Finalized
- Mar 2019: NCRB Selected Vendors
- Mar 2020: NCRB Announced
- Feb 2020: DOI Approved

Review, Implement, Write

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**Goal:**
To develop a long term, quality flood solution for the state of North Carolina that is accepted by lenders and offers residential risk coverage options that are equal to or greater than the current policy offered by the NFIP.

**Plan:**
- Bring in industry experts to create a property flood subcommittee
- Bring in top flood experts to help build a new flood program for North Carolina
- Match price to risk and cover residential property types
Top Goals and Considerations

- NC offers a Flood program that is consistent with a countrywide solution
- NC offers a flood program that is similar to FEMA/NFIP program
- NC Flood Solution should be a long term quality product
- NC Flood Program has lender market acceptance (mortgage companies)
The following notable differences exist between NFIP and NCRB:

<table>
<thead>
<tr>
<th>Program Detail</th>
<th>NFIP</th>
<th>NCRB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage A: Dwelling Limits</td>
<td>$250,000 maximum</td>
<td>No limit</td>
</tr>
<tr>
<td>Coverage C: Personal Property Limits</td>
<td>$100,000 maximum</td>
<td>No limit</td>
</tr>
<tr>
<td>Coverage D: Additional Living Expenses</td>
<td>Not covered</td>
<td>Optional</td>
</tr>
<tr>
<td>Deductibles</td>
<td>Separate deductibles by coverage type</td>
<td>Single deductible per policy</td>
</tr>
<tr>
<td>Replacement Cost</td>
<td>Single family dwellings only</td>
<td>1-4 family dwellings, with 1 detached garage</td>
</tr>
<tr>
<td></td>
<td>Detached garage &amp; personal property not covered</td>
<td>Optional endorsements for personal property and other structures</td>
</tr>
<tr>
<td>Basement/Below Ground Areas - Dwelling</td>
<td>Covered</td>
<td>Covered</td>
</tr>
<tr>
<td>Basement/Below Ground Areas- Contents</td>
<td>Not covered (exception for certain appliances)</td>
<td>Optional</td>
</tr>
<tr>
<td>Detached Garages/Structures</td>
<td>Up to 1 (Within the coverage A limit)</td>
<td>1 detached garage (Within the coverage A limit) - Optional (ex. 10% in additional to coverage A for all structures, or scheduled structures)</td>
</tr>
<tr>
<td>Increased Cost of Compliance</td>
<td>$30,000 maximum</td>
<td>$30,000 minimum, with higher limits available</td>
</tr>
<tr>
<td>Ordinance or Law</td>
<td>Not covered</td>
<td>Optional</td>
</tr>
</tbody>
</table>
Model Evaluation: Average AAL

Average AAL impacts the rate level

Wide disparities exist across different models for inland flood

Storm surge also has sizeable variation of AALs among the models
## Model Evaluation: Outlier Analysis

Model A inland flood AALs have more variation than other models.

### Inland Flood (4 Counties)

<table>
<thead>
<tr>
<th></th>
<th>% Missing AAL</th>
<th>% Zero AAL</th>
<th>Below 50% of min</th>
<th>Over 150% of max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A</td>
<td>0.0%</td>
<td>19.5%</td>
<td>70.4%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Model B</td>
<td>11.4%</td>
<td>1.2%</td>
<td>16.7%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Model C</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.4%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Model D</td>
<td>0.0%</td>
<td>0.5%</td>
<td>0.8%</td>
<td>45.4%</td>
</tr>
</tbody>
</table>

### Storm Surge (2 Counties)

<table>
<thead>
<tr>
<th></th>
<th>% Missing AAL</th>
<th>% Zero AAL</th>
<th>Below 50% of min</th>
<th>Over 150% of max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A</td>
<td>0.0%</td>
<td>26.8%</td>
<td>0.5%</td>
<td>25.6%</td>
</tr>
<tr>
<td>Model B</td>
<td>4.7%</td>
<td>20.4%</td>
<td>0.0%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Model C</td>
<td>0.0%</td>
<td>49.7%</td>
<td>20.3%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Model D</td>
<td>0.0%</td>
<td>47.9%</td>
<td>11.4%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Models B and C have the fewest outliers; Model B had many locations with missing AAL.

Models A, B, and C have about 10-15% more outliers.
Inland Flood + Storm Surge: Ground Up Loss
In addition to reflecting North Carolina specific rates, the following notable differences exist between the NFIP and the North Carolina flood product:

<table>
<thead>
<tr>
<th>Rating Characteristic</th>
<th>NFIP*</th>
<th>NCRB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Rating Granularity</td>
<td>Base Flood Elevation (BFE) in SFHA</td>
<td>30 Meters Statewide</td>
</tr>
<tr>
<td>Modern Multiplicative Rating Algorithm</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Transparent Impacts of Property Characteristics</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Insurance to Value</td>
<td>Limited</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Characteristics shown are based on NFIP rates as of April 2020. Risk Rating 2.0 is expected to address these issues.*
High Risk Flood Zone: Flood Map
Granular Flood Rating

Flood risk varies significantly within and across flood zones
North Carolina: Flood Rating
Overview of Ratemaking Process

1. Run catastrophe model
2. Develop geographic base rates
3. Develop rating factors
4. Develop coverage factors
5. Apply rates to market basket
6. Adjust rates to match coverage
7. Add provisions
8. Develop expense loads
9. Apply final rates
10. Compare to other premiums
Catastrophe Modeling and Base Rates

SpatialKat

✓ Probabilistic Inland Flood and Hurricane Wind/Storm Surge Model
✓ For this analysis, the NCRB is using the Inland Flood and Storm Surge Models

Inland Flood

Storm Surge

Inland Flood + Storm Surge

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Polling Question: Property Characteristics

What Rating Variable do you think would have the most impact on flood premium pricing?

- First Floor Height
- Replacement Cost of Dwelling
- Location
- Year Built
- Number of Stories
### Property Characteristics

#### House A
- Limits for Coverage A/B/C/D: $200K/20K/100K/60K
- Replacement Value of Dwelling: $200K
- First Floor Height: 1 Ft
- # Stories: 2 without basement
- Premium: $1,022

#### House B
- Limits for Coverage A/B/C/D: $100K/20K/50K/60K
- Replacement Value of Dwelling: Same as House A
- First Floor Height: Same as House A
- # Stories: Same as House A
- Premium: $921

#### House C
- Limits for Coverage A/B/C/D: Same as House A
- Replacement Value of Dwelling: $400K
- First Floor Height: Same as House A
- # Stories: Same as House A
- Premium: $1,478

#### House D
- Limits for Coverage A/B/C/D: Same as House A
- Replacement Value of Dwelling: Same as House A
- First Floor Height: 8 Ft
- # Stories: 1 with finished basement
- Premium: $296

#### House E
- Limits for Coverage A/B/C/D: Same as House A
- Replacement Value of Dwelling: Same as House A
- First Floor Height: Same as House A
- # Stories: 1 with finished basement
- Premium: $2,584
Property Characteristics

- Developed an Exposure set specifically for Rate Development
- Utilized a Generalized Linear Model, targeting Ground Up Loss and controlling for geographic risk
- Used training dataset to ensure rates matched modeled loss
  - Added interactions based on storm surge exposure and overall risk
- Indicated Rates developed and validated on holdout dataset for:
  - Basement Type
  - Construction
  - First Floor Height
  - Floor of Interest
  - Number of Stories
  - Tie Downs
  - Other Structures Coverage
Coverage Factors

Rate development exposure set
Insurance to value adjustments
Deductible adjustments
Market Basket Validation

North Carolina Property Records

Homeowners Quote Records

Insurance Industry Surveys

Property Rate Filings

USGS Digital Elevation Maps & FEMA Digital Flood Maps

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Match Rates to Forms

01 Coverage differences

02 Develop non-modeled rating factors

03 Select expenses
Competitive Analysis

Outside of high risk flood zone, 95% of residences saw a lower rate!

Inside high risk flood zone, 40% of residences saw a lower rate!

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Overview of Ratemaking Process

1. Run catastrophe model
2. Develop geographic base rates
3. Develop rating factors
4. Develop coverage factors
5. Apply rates to market basket
6. Adjust rates to match coverage
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8. Develop expense loads
9. Apply final rates
10. Compare to other premiums
Filing Strategies

Working with the existing patchwork of requirements by state

- Trade secret protected meetings
- Public rate examples
- Regulator controlled access to rates
<table>
<thead>
<tr>
<th>Step</th>
<th>Sample Inputs</th>
<th>Coverage A</th>
<th>Coverage C</th>
<th>Coverage D</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Base Risk Grid AAL</td>
<td></td>
<td>208.350</td>
<td>208.350</td>
<td>208.350</td>
</tr>
<tr>
<td>(B) Base Rate Adjustment</td>
<td>Without Storm Surge Exposure</td>
<td>0.00316</td>
<td>0.00297</td>
<td>0.00076</td>
</tr>
<tr>
<td>(C) Coverage Value or Limit (Note 1)</td>
<td>200,000</td>
<td>100,000</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td>(D) Coverage Base Rate</td>
<td>131.68</td>
<td>61.68</td>
<td>9.50</td>
<td></td>
</tr>
<tr>
<td>(1) Deductible (Note 2)</td>
<td>2.0%</td>
<td>0.868</td>
<td>0.876</td>
<td></td>
</tr>
<tr>
<td>(2) Insurance to Value (Note 3)</td>
<td>100%</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Construction</td>
<td>Masonry</td>
<td>0.850</td>
<td>1.000</td>
<td>0.830</td>
</tr>
<tr>
<td>(4) First Floor Height (Note 4)</td>
<td>FFH = 1, Group 2</td>
<td>0.801</td>
<td>0.807</td>
<td>0.737</td>
</tr>
<tr>
<td>(5) Number of Stories</td>
<td>2</td>
<td>0.630</td>
<td>0.550</td>
<td>0.580</td>
</tr>
<tr>
<td>(6) Floor of Interest (Note 5)</td>
<td>1</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>(7) Type of Below Ground Area Finish</td>
<td>Finished</td>
<td>1.560</td>
<td>1.410</td>
<td>1.590</td>
</tr>
<tr>
<td>(8) Mobile Home Tie Down (Note 6)</td>
<td>N/A</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>(9) Building Equipment in a Crawl Space or Attached Garage (Note 7)</td>
<td>N</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10) Ordinance or Law (Note 8)</td>
<td>N</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>(11) Personal Property Replacement Cost (Note 9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(12) Optional Other Structures Adjustment (Note 10)</td>
<td>Y</td>
<td>0.984</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(13) Coverage Loss Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(14) Loss Cost Multiplier (Note 11)</td>
<td>Storm Surge Percent = 0.00</td>
<td>3.831</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(15) Coverage Base Premiums</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(16) Optional Other Structures Limit</td>
<td>20,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(17) Coverage Base Premium</td>
<td>$288.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(18) Loss Assessment Limit</td>
<td>10,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(19) Loss Assessment Premium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(20) Increased Cost of Compliance Limit</td>
<td>30,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(21) Increased Cost of Compliance Factor</td>
<td>0.0006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(22) Increased Cost of Compliance Premium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(23) Premium Subtotal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(24) Minimum Premium</td>
<td>Homeowners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(25) Total Premium</td>
<td></td>
<td>494.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Polling Question: Implementation

What concerns would you have with implementing a flood program for an insurance carrier?

- Volatility of flood risk
- Uncertainty of state rate & form regulation
- Reinsurance availability & price stability
- Perceived inability to complete with NFIP
- Lack of expertise in underwriting & claims
- Flood model and data uncertainty
- Lack of consumer demand
- Underwriting risk of severe repetitive loss properties
Industry Survey Results

What concerns would you have with implementing a flood program for an insurance carrier?

1. Reinsurance availability and price stability
2. Volatility of flood risk
3. Flood model and data uncertainty
4. Underwriting risk of severe repetitive loss properties
5. Lack of consumer demand
6. Uncertainty of state rate and form regulation
7. Lack of expertise in underwriting and claims
8. Perceived inability to compete with the NFIP
Flood Program: Next Steps
Flood Program: Next Steps
Flood Program: Education

NC Coastal Agents

NCRB Member Companies

FEMA

Independent Insurance Agents of North Carolina

Trusted Choice®
“Our overall conclusion is that the Rate Bureau plan is a **healthy** addition to the flood insurance marketplace ... We see an observable **positive** benefit of the Rate Bureau’s plan to the State Of North Carolina”

- Brantley Risk and Insurance Center, Appalachian State University
Steps for Company Implementation

**Option 1**
North Carolina Flood Tool (API)

**Option 2**
Obtain from the Rate Bureau the entire set of data (140 million records)
Steps for Company Implementation

- “Waiting Period” on obtaining insurance
- Determine first floor height
- Cap coverage A limits, yes or no?
- Determine whether to use rate deviations
- Source for replacement cost for the property
- Cover properties identified in the Coastal Barrier Resources Act
Any Questions?