RESILIENCY IN THE FACE OF EXTREME HAIL AND WIND EVENTS

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SEVERE CONVECTIVE STORM
2017 SEASON HIGHLIGHTS (LOWLIGHTS?)

NOAA Estimate Cost $B

Texas Hail Storm (June 2018)
Central and Eastern Severe Weather (May 2018)
Central and Northeastern Severe Weather (May 2018)
Southeastern Severe Storms and Tornadoes (March 2018)
Midwest Severe Weather (June 2017)
Midwest Severe Weather (June 2017)
Minnesotta Hail Storm and Upper Midwest Severe Weather (June 2017)
Colorado Hail Storm and Central Severe Weather (May 2017)
South/Southeast Severe Weather (March 2017)
Midwest Tornado Outbreak (March 2017)
Central/Southeast Tornado outbreak (March 2017)
Southern Tornado Outbreak and Western Storms (January 2017)

$18.6M estimated losses from SCS perils in 2017
US NOAA INDUSTRY ESTIMATED LOSSES
WIND AND THUNDERSTORM CATEGORY, 1980 – 2018Q2

Is the frequency/severity of weather phenomena responsible for the increase in losses?
Do population shifts account for the steady increase in losses?
Are materials and reconstruction costs outpacing inflation?

NOAA BILLION DOLLAR DISASTER EVENTS
SEVERE CONVECTIVE STORM CONTRIBUTION

Source: NOAA
LARGEST THUNDERSTORM LOSS YEARS
INFLATION ADJUSTED; HIGHEST LOSSES IN RECENT YEARS

# States with largest thunderstorm loss year

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Source: PCS

HAIL SIZE VS. STRUCTURAL IMPACT
THE SCIENCE

Hail Formation

Hail growing in circulating convection currents

More Updraft → More Rings → Larger Hailstone

More Updraft → More Rings → Larger Hailstone

Rain drops being sucked into the updraft

Impact Energy (ft-lbs)

0  50  100  150  200  250  300  350  400

Diameter (in.)

0  2  4

3.5 to 4" hail in Norfolk, NE
June 3, 2014
HURRICANE VS SCS LOSS IN THE US
COUNT AND TOTAL OF BILLION DOLLAR LOSS EVENTS

# of Billion Dollar Events

<table>
<thead>
<tr>
<th>Year</th>
<th>SCS</th>
<th>Hurricane</th>
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<td>1980-89</td>
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<td>5</td>
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<td>1990-99</td>
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<td>15</td>
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<tr>
<td>2010-18</td>
<td>40</td>
<td>20</td>
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</table>

Total Economic Loss ($B)

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<tr>
<th>Year</th>
<th>SCS</th>
<th>Hurricane</th>
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<tbody>
<tr>
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<td>40</td>
</tr>
</tbody>
</table>

Source: NOAA

LATEST RESEARCH IN HAIL TRENDS
MODELING IMPACTS OF MID-CENTURY CLIMATE CHANGE

Change in Spring Hail Frequency (Days)

<table>
<thead>
<tr>
<th>Change in Spring Hail Size (inches)</th>
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<tbody>
<tr>
<td>1.00 to 2.00</td>
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IMPACT OF SPRAWLING POPULATION
THE “ENDLESS CITY” & "BULLS-EYE" EFFECT

Modern Metropolis
1930s to 1970s

Post-Modern Metropolis
1970s to 2000s

Macropolitans
2000s to 2020s

Source: UNLV & Brookings Institution

HAIL IN THE GREAT PLAINS
INFLUENCE OF LARGER CORN CROPS?

3°C rise in dewpoint

3-4°C rise in temp due to urban heat island

Combination of factors potentially increases longevity of long lived updrafts, accumulating to larger hail sizes
TALE OF TWO TORNADO SEASONS
2018 NEAR RECORD LOW ACTIVITY

THE ACCELERATION OF ARCTIC ICE LOSS
HOW IT IS CONNECTED TO NORTH AMERICAN WEATHER?
REDUCED ARTIC SEA ICE
SUPPRESSING TORNADO ACTIVITY

*Trapp and Hoogewind, 2018

INGREDIENTS OF A CAT MODEL
SEVERE CONVECTIVE STORM

Define
Frequency/Rate
Number and size of hail, tornado and wind streaks
Location and orientation of each tornado, hail and wind streak

Assess
Hazard intensity at each location
Surface roughness

Calculate
Vulnerability
Mean Damage Ratio (MDR) and Coefficient of Variation (CV)

Quantify
Losses to different financial perspectives
HAIL CLAIMS AND REINSURANCE
IMPLICATIONS
FROM TMLIRP’S PERSPECTIVE
HAIL CLIMATOLOGY
US HAIL DAYS (2000-2016)

PROPERTY OCCURRENCE LOSSES BY PERIL
INFLATION ADJUSTED (3%)

- All Property Occurrence greater than $1 million (2017-18 dollars)
- Hurricane Rita in 2004-05
- Hurricane Ike in 2007-08
- Hurricane Harvey in 2016-17
- Increase in Hail & Wind Peril frequency & severity in recent years
APRIL 11, 2016 EVENT
SPC AND RADAR-ESTIMATED FOOTPRINTS

PROPERTY REINSURANCE STRUCTURE

TMLIRP Pro-Rata Share
Outside Reinsurance Pro-Rata Share

2007-08 Structure

<table>
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<tr>
<th>Coverage Level</th>
<th>2007-08 Structure</th>
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<tbody>
<tr>
<td>$50M</td>
<td>90%</td>
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<tr>
<td>$40M</td>
<td>85%</td>
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<td>$7M</td>
<td>55%</td>
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Current Structure

<table>
<thead>
<tr>
<th>Coverage Level</th>
<th>Current Structure</th>
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<tbody>
<tr>
<td>$50M</td>
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<tr>
<td>$50M</td>
<td>75%</td>
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<td>80%</td>
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<td>$15M</td>
<td>70%</td>
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<td>$10M</td>
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PROPERTY OCCURRENCE LOSSES ALLOCATION
INFLATION ADJUSTED (3%) AND BASED ON CURRENT STRUCTURE

- Current Reinsurance Retention is $10 million
- Retain ~ 20% of 40M xs 10M layer
- Retain 25% of 150M xs 50M layer
- Retain 50% of 50M xs 200M layer
- Reinsurance is pierced primarily by Hurricane activity
- Wind and Hail storms are retained
- 2013-14 Wind and Hail storm is only one to pierce $10 million

PROPERTY OCCURRENCE LOSSES BY LOSS LAYERS
INFLATION ADJUSTED (3%)

- Excess of $10M are primarily Hurricane losses
- Layers below $4M are consistent except for 2015-16 were we incurred outlier frequency of 13 occurrences
- Trend increase is reflected in 6M xs 4M layer. Prior to 2010-11, this layer was pierced only by Hurricanes. Every since 2010-11 has been pierced by Wind and Hail storms.
STRATEGY: MANAGE THE EXPOSURE

Property litigation in Texas - a cottage industry

A Three Pronged Approach to Manage the Exposure:

• Claims Management/Operational Initiatives
• Coverage Management/Adjustments
• Membership Management/Communications

PROPERTY LITIGATION IN TEXAS
PARTICULARLY POST HURRICANE IKE

• Significant issue in Texas-legislature took action in 2017 to curtail activity in order to protect consumers in relation to carriers willing to write property coverage at reasonable rates

• Pool's advantage: not subject to Texas Insurance Code, therefore not subject to penalties associated with things like “Bad Faith” (a prime negotiating tool of plaintiff attorneys and public adjusters)

• Pool not immune to member disputes involving outside parties that suggest value of claim is much higher (+412% higher in the demands we've seen); yet final payments have been less than 20% of the original demand-ultimately members have received less after contingency payments (-17%)
CLAIMS MANAGEMENT

Number 1 Goal: Develop member trust with the claims team through superior and specialized service

• Dedicated Property Unit under leadership of the Assistant Property/Liability Claims Manager (new position)
• Roofing consultant provided to member at no cost
  - Damage Assessments
  - Preparation of RFPs
• Frequent and early communications with members

COSMETIC OR AESTHETIC ROOF DAMAGE
REAL AND PERSONAL PROPERTY EXCLUSION

The following are excluded from coverage under the Property Coverage Document:

Roof coverings that have sustained only cosmetic loss or damage caused by hail, unless such cosmetic loss or damage causes a decrease in the market value of the building to which the roof covering is attached. In the event of a decrease in the market value of such building, the agreement shall cover the lesser of the decrease in market value of such building, the actual cash value of the roof covering, or the replacement cost of the roof covering. Cosmetic loss or damage means only that damage that alters the physical appearance of the roof covering but does not result in damage that allows the penetration of water through the roof covering or does not result in the failure of the roof covering to perform its intended function, to keep out the elements over an extended period of time.
COVERAGE MANAGEMENT

• 1% wind and hail deductible (aligns incentive of member with the Pool to control the cost of the claim)
• Explicit statement of the Pool’s status as “self-insured” (not subject to Texas Insurance Code, the Pool is not insurance)
• Requirements for timely notices and proof of loss (if requested)
• Clarification of the Appraisal Process within the coverage document
• Require fair and adequate scheduling of property by members
• Address the increased cost of construction provisions
• Prohibition on transfers of interests
• Institution of a 150% margin clause
  • Special property assessment services targeted to utility facilities

MEMBERSHIP MANAGEMENT/COMMUNICATIONS

• Pool represents a partnership among the members to share risk
  • Communications initiative, including the purpose and nature of pooling
• Pool staff serves as the fiduciaries or stewards of the partnership
• Changes put in place to improve equity across the membership:
  • Specialized services for fair and prompt payment of claims
  • Reporting of complete schedules with accurate values
  • Coverage adjustments to benefit the partnership as a whole
• Board of Trustees serve as the final arbiters of disputes, as they represent the members
IMPACT OF CHANGES ON REINSURANCE

- Discuss during annual meetings with reinsurance underwriters
  - Existing and prospective
  - Pool utilizes 30+ reinsurers
- Indicates proactive responses to challenges “precipitated” by hail
- Aligns with the partnership the Pool has with its reinsurers

QUESTIONS?

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