The Legacy of Hurricane Andrew: What Has Been Learned Over the Past 20 Years?

Florida International University
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Hurricane Andrew: The Legacy Lives On

- At $15.5 Bill, Hurricane Andrew Was the Costliest Insurance Event in Global History When it Occurred in 1992 ($25 Bill in 2011 $)
  - Andrew held that title until the Sept. 11, 2001 terrorist attacks ($24 bill in 2011 $)
  - Most expensive natural disaster until Hurricane Katrina ($47.6 bill in 2011 $)

- Hurricane Andrew Was the Most Disruptive Event in US Insurance History
  - 11 small insurers failed (FL, LA); resources of many large insurers were strained

- Hurricane Andrew Fundamentally and Irrevocably Changed How Insurers and Reinsurers Manage Catastrophic Risk in the US and Globally

- Insurance Markets Changes Occurring in the 20 Years Since Andrew:
  - More Carefully Managed Coastal Exposure (and for cat exposure in general)
  - Capital Base (Capacity) of Global (Re)Insurance Industry Greatly Expanded
  - More Use of Reinsurance
  - Birth and Rapid Evolution of Sophisticated Catastrophe Modeling
  - Growth of Markets Like Bermuda
  - Use of Capital Market Instruments (e.g., CAT Bonds)
  - Larger Role of Government in Insuring Coastal Risks
  - Strong Support for Strengthened Building Codes and Mitigation
Lesson Learned: Strong Building Codes, Mitigation Are Essential in Creating Disaster Resistant Communities

Hurricane Andrew Had Major Impact on Building Code Strengthening and Enforcement
Residential Building Code Ratings in Hurricane Prone States

<table>
<thead>
<tr>
<th>State</th>
<th>Total</th>
<th>Adoption of code, universality, and weakening provisions</th>
<th>Enforcement Officials</th>
<th>Contractor Licensing</th>
</tr>
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<tbody>
<tr>
<td>Florida</td>
<td>95</td>
<td>48</td>
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<td>Virginia</td>
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<td>Rhode Island</td>
<td>78</td>
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<td>15</td>
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<td>Louisiana</td>
<td>73</td>
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<td>73</td>
<td>43</td>
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<td>15</td>
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<tr>
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<td>66</td>
<td>31</td>
<td>15</td>
<td>20</td>
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<tr>
<td>Maine</td>
<td>64</td>
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<td>9</td>
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<td>New York</td>
<td>60</td>
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<td>Delaware</td>
<td>17</td>
<td>4</td>
<td>0</td>
<td>13</td>
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<td>Mississippi</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

IBHS rankings were weighted based on the following variables:
- 50 percent for variables that relate to adoption and enforcement of building codes;
- 25 percent for variables that measure code official certification and training; and
- 25 percent for variables that relate to on-site implementation, as measured by contractor and subcontractor licensing.

Florida and Virginia were the top ranked states in terms preparedness of residential structures against hurricane damage.

Despite catastrophic losses from Hurricane Katrina in 2005, MS still has no statewide building code, putting it dead last in the US; AL and TX rank poorly as well despite major post-Andrew storms.

Florida Leads the US with 2.1 Million NFIP Policies in Force*

*As of Sept. 30, 2011
Insurance Industry Invests Millions in Property Loss Reduction Research

In 2010, the Insurance Institute for Business and Home Safety Research Center Opened in Chester County, SC. The $40 Million Facility Is Entirely Funded by the Insurance Industry and Its Mission Is to Conduct Research to Reduce Property Loss from a Variety of Perils, Including Hurricanes.

Source: Insurance Information Institute from IBHS web site: http://ofb.ibhs.org/research
Lesson NOT Learned: The US Is More Vulnerable than Ever to Catastrophic Hurricane Loss

Hurricane Andrew Had Zero Effect in Terms of Diminishing Demand for At-Risk Property
U.S. Insured Catastrophe Loss Update

2011 Was One of the Most Expensive Years on Record
Top 14 Most Costly Disasters in U.S. History

(Insured Losses, 2011 Dollars, $ Billions)

Even 20 years later, Hurricane Andrew is the 2nd most expensive event in US history

Most of the costliest disaster in US history were hurricanes, most impacting FL

*Losses will actually be broken down into several “events” as determined by PCS. Includes losses for the period April 1 – June 30. Sources: PCS; Insurance Information Institute inflation adjustments.
There were 117 natural disaster events in 2011.
Losses Due to Natural Disasters in the US, 1980–2011 (Overall & Insured Losses)

(2011 Dollars, $ Billions)

2011 was the 5th most expensive year on record for insured catastrophe losses in the US.

Approximately 50% of the overall cost of catastrophes in the US was covered by insurance in 2011.

2011
Overall Losses: $72.8 Bill
Insured Losses: $35.9 Bill

Source: MR NatCatSERVICE
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US Insured Catastrophe Losses

US CAT Losses in 2011 Were the 5th Highest in US History on An Inflation Adjusted Basis

*PCS figure as of April 6, 2012.

Note: 2001 figure includes $20.3B for 9/11 losses reported through 12/31/01 ($25.9B 2011 dollars). Includes only business and personal property claims, business interruption and auto claims. Non-prop/BI losses = $12.2B ($15.6B in 2011 dollars.)

Sources: Property Claims Service/ISO; Insurance Information Institute.
Inflation Adjusted U.S. Catastrophe Losses by Cause of Loss, 1990–2011:H1

1. Catastrophes are defined as events causing direct insured losses to property of $25 million or more in 2009 dollars.
2. Excludes snow.
3. Does not include NFIP flood losses
4. Includes wildland fires
5. Includes civil disorders, water damage, utility disruptions and non-property losses such as those covered by workers compensation.

Source: ISO’s Property Claim Services Unit.

Wind losses are by far cause the most catastrophe losses, even if hurricanes/TS are excluded.

Tornado share of CAT losses is rising

- Hurricanes & Tropical Storms, $160.5
- Wind/Hail/Flood (3), $12.7
- Geological Events, $18.5
- Terrorism, $24.9
- Winter Storms, $30.0
- Fires (4), $9.0
- Other (5), $0.6
- Tornadoes (2), $119.5
- Other (5), $0.6

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- Fires (4), $9.0
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- Tornadoes (2), $119.5

Wind losses are by far cause the most catastrophe losses, even if hurricanes/TS are excluded.
Florida’s Longest Span Between Hurricanes

The current hurricane dry spell is the second longest in recorded history. Despite recent low activity, it is not a question of “IF” a hurricane will hit Florida but “WHEN”

9 Years 53 Days
Aug., 31, 1856 - Oct. 23, 1865

6 Years 249 Days*
Oct. 24, 2005 - ???*

6 Years 79 Days*
Sep. 4, 1979 - Nov. 20, 1985

6 Years 317 Days*

*As of June 30, 2012
Source: USA Today, 6/26/12. from flhurricane.com; Insurance Information Institute.
RNW Homeowners: FL vs. U.S., 1990-2010

Sources: NAIC.

Sources: NAIC.
Global Property Catastrophe Rate on Line Index, 1990—2012 (as of Jan. 1)

Year Over Year % Change

Cumulative Rate on Line Index

Hurricane Andrew had a major impact on Property-Cat reinsurance pricing

Sources: Guy Carpenter; Insurance Information Institute.
Florida was the only state to get a grade of “F” in 2011, due in large part to its disastrous state-run (re)insurance programs.

Not Graded: District of Columbia
Source: R Street Institute, June 2012.
Coastal Residual Market Exposure

State-Run Coastal Plans Surged With Population Growth in Exposed States; Growth Continues
Population Growth Projections for Hurricane Exposed States (2000 to 2030) (000s)

<table>
<thead>
<tr>
<th>State</th>
<th>Projected Growth (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>12,703.4</td>
</tr>
<tr>
<td>Texas</td>
<td>12,465.9</td>
</tr>
<tr>
<td>North Carolina</td>
<td>4,178.4</td>
</tr>
<tr>
<td>Georgia</td>
<td>3,831.4</td>
</tr>
<tr>
<td>Virginia</td>
<td>2,746.5</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>410.7</td>
</tr>
<tr>
<td>Maryland</td>
<td>1,725.8</td>
</tr>
<tr>
<td>Delaware</td>
<td>229.1</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1,136.6</td>
</tr>
<tr>
<td>Hawaii</td>
<td>254.5</td>
</tr>
<tr>
<td>New Jersey</td>
<td>1,388.1</td>
</tr>
<tr>
<td>Maine</td>
<td>136.2</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>662.9</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>104.6</td>
</tr>
<tr>
<td>Alabama</td>
<td>427.1</td>
</tr>
<tr>
<td>Mississippi</td>
<td>247.8</td>
</tr>
<tr>
<td>Connecticut</td>
<td>283.1</td>
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<tr>
<td>Louisiana</td>
<td>333.7</td>
</tr>
<tr>
<td>New York</td>
<td>501.0</td>
</tr>
</tbody>
</table>

By 2030, Florida is expecting a population increase of 12.7 million, closely followed by Texas with an expected increase of 12.5 million.

The U.S. as a whole is expected to have a population increase of 82.1 million, or 29.2 percent during the same period.

Source: U.S. Census Bureau, accessed at http://www.census.gov/population/projections/PressTab1.xls
Leading Coastal Counties In Projected Population Change, 2011-2025

Four of the five fastest growing coastal counties expected from 2011 to 2025 are located along the Gulf of Mexico.

In the 22-year period between 1990 and 2011, the total number of policies in-force in the residual market (FAIR & Beach/Windstorm) Plans has more than tripled.
In the 22-year period between 1990 and 2011, total exposure to loss in the residual market (FAIR & Beach/Windstorm) Plans has surged from $54.7 billion in 1990 to a record high of $884.7 billion in 2011.
In the 22-year period between 1990 and 2011, the total number of policies in-force in the nation’s FAIR Plans has more than tripled.

Source: PIPSO; Insurance Information Institute
Total exposure to loss in the residual market (FAIR & Beach/Windstorm) Plans has surged from $54.7bn in 1990 to a record $884.7 billion in 2011.

In the 22-year period between 1990 and 2011, total exposure to loss in the FAIR Plans has surged by a massive 1,679 percent from $40.2 billion in 1990 to $715.3 billion in 2011.

Source: PIPSO; Insurance Information Institute
In 2002 Florida combined its Windstorm and Joint Underwriting Association to create Florida Citizens, so Florida data shifted to the FAIR plans from this date.

In the 22-year period between 1990 and 2011, total exposure to loss in the Beach and Windstorm plans ballooned by more than 550 percent, from $14.5 billion in 1990 to $169.4 billion in 2011.*

*PIPSO figures for 2011 include the North Carolina Beach Plan, now a member of PIPSO (as of June, 2012).
Source: PIPSO; Insurance Information Institute
The FAIR plans’ aggregate operating loss between 1995 and 2005 ballooned by 3584 percent.

In the course of the last six years (2006-2011) the FAIR plans have reported an aggregate operating gain, after successive operating losses in 2005 and 2004.

Source: PIPS0; Insurance Information Institute.
FAIR/Beach Plan Earned Premium as % of Overall Property Market (Top 5 states) 2002 vs. 2010

Source: PIPSO; Insurance Information Institute
Florida had $2.5 trillion in insured coastal property exposure in 2007, the highest of any hurricane-exposed state.
Insured Coastal Exposure As a % Of Statewide Insured Exposure In 2007

- Florida: 79.0%
- Connecticut: 64.0%
- New York: 62.0%
- Maine: 59.0%
- Massachusetts: 54.0%
- Delaware: 36.0%
- Louisiana: 35.0%
- New Jersey: 34.0%
- Rhode Island: 29.0%
- S. Carolina: 28.0%
- Texas: 26.0%
- NH: 23.0%
- Mississippi: 13.0%
- Alabama: 12.0%
- Virginia: 11.0%
- NC: 9.0%
- Georgia: 5.0%
- Maryland: 1.0%

Source: AIR Worldwide
Value of Insured Residential Coastal Exposure In 2007 ($ Billions)

- Florida: $1,238.6
- New York: $660.4
- Texas: $388.3
- Massachusetts: $373.0
- New Jersey: $319.5
- Connecticut: $250.8
- Louisiana: $96.9
- S. Carolina: $90.1
- Maine: $81.1
- North Carolina: $78.4
- Virginia: $72.6
- Alabama: $46.5
- Georgia: $38.1
- Delaware: $36.7
- Rhode Island: $31.9
- New Hampshire: $30.8
- Mississippi: $25.7
- Maryland: $7.2

Source: AIR Worldwide
Value Of Insured Commercial Coastal Exposure 2007 ($ Billions)

New York          $1,718.6
Florida           $1,220.0
Texas             $506.8
Massachusetts     $399.8
New Jersey        $316.0
Connecticut       $299.1
Louisiana         $129.1
S. Carolina       $101.8
Virginia          $86.2
Maine             $65.9
North Carolina    $54.4
Georgia           $47.5
Alabama           $46.0
Mississippi       $26.1
New Hampshire     $24.9
Delaware          $23.8
Rhode Island      $22.2
Maryland          $7.7

Source: AIR Worldwide
Public Attitude Monitor 2006: Unfairness of Policyholder Subsidies

Growth in residual market mechanisms may be due in part to implicit support of residents of coastal communities.

Source: Insurance Research Council
Some 59% of those living in interior counties and 61% in noncoastal states think taxpayer-subsidized insurance is unfair, compared to just 51% of those living in coastal counties.
The FAIR plans’ aggregate operating loss between 1995 and 2005 ballooned by 3584 percent.

In the course of the last six years (2006-2011) the FAIR plans have reported an aggregate operating gain, after successive operating losses in 2005 and 2004.

Source: PIPSO; Insurance Information Institute.
Residual Market Plan Estimated Deficits 2004/2005 (Millions of Dollars)

* MWUA est. deficit for 2005 comprises $545m in assessments plus $50m in Federal Aid.
Source: Insurance Information Institute
Since its creation in 2002, total exposure to loss in Florida Citizens has increased by 230 percent, from $154.6 billion to $510.7 billion in 2011.

Louisiana had $224.4 billion in insured coastal property exposure in 2007, 7th highest of any hurricane-exposed state.
Mississippi Windstorm Plan: Exposure to Loss (Millions of Dollars)

Total exposure to loss in the Mississippi Windstorm Underwriting Association (MWUA) has surged by 1,943 percent, from $352.9 million in 1990 to $7.2 billion in 2011.

Source: PIPSO; Insurance Information Institute
TWIA’s exposure to loss for building & contents has surged by 495 percent in the last 12 years from $12.1 billion in 2000 to $72.0 billion in 2012.

Source: TWIA at 06/05/12, Texas Department of Insurance, Southwestern Insurance Information Services (SIIS)
By March 31, 2012, TWIA’s total exposure had surged to $79.1 billion.
Texas Windstorm Insurance Association (TWIA) New Financial Structure

New TWIA financing structure made available up to $2.5 billion to fund losses via three post-event bonding layers. The new structure eliminated the unlimited assessment on TWIA member insurers and did not call for TWIA to purchase reinsurance.

Source: Southwestern Insurance Information Institute (SIIS)
In the 22-year period between 1990 and 2011, the number of policies in the MA FAIR plan has surged by 336 percent from 49,628 policies in 1990 to 216,182 policies in 2011.

Source: PIPSO; Insurance Information Institute
In the 22-year period between 1990 and 2011, total exposure to loss in the MA FAIR plan has surged by 1,771 percent from $4.1 billion in 1990 to $76.7 billion in 2011.

Source: PIPSO; Insurance Information Institute
The MA FAIR Plan’s operating results have been variable over the years.
Insurance Information Institute Online:

www.iii.org

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