



CS-3: Catastrophe Modeling Update Managing Zonal Risk

Casualty Actuaries in Reinsurance
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Introduction

- The highest wind speed and often the most intense damage from hurricanes occurs at the coast
- The footprint of storm damage often extends far inland
- There is significant exposure and thus loss potential from inland exposure
- Some companies focus heavily on managing exposure in coastal counties, not paying sufficient attention to inland risk

About 17 Percent of U.S. Industry Exposure is in Atlantic and Gulf Coastal Counties

Estimated 2007 Insured Value of Coastal Properties by State (\$B)

State	State Total (\$B)	Coastal Counties ² (\$B)	Percent Coastal
Alabama	744.8	92.5	12%
Connecticut	750.4	479.9	64%
Delaware	170.8	60.6	36%
Florida	3,119.6	2,458.6	79%
Georgia	1,573.3	85.6	5%
Louisiana	638.4	224.4	35%
Maine	250.0	146.9	59%
Maryland	1,078.4	14.9	1%
Massachusetts	1,426.4	772.8	54%
Mississippi	394.6	51.8	13%
New Hampshire	237.4	55.7	23%
New Jersey	1,875.2	635.5	34%
New York	3,851.1	2,378.9	62%
North Carolina	1,431.8	132.8	9%
Rhode Island	189.3	54.1	29%
South Carolina	698.2	191.9	28%
Texas	3,493.0	895.1	26%
Virginia	1,409.4	158.8	11%
All States Above	23,332.4	8,890.8	38%
Total U.S.	53,495.0	8,890.8	17%

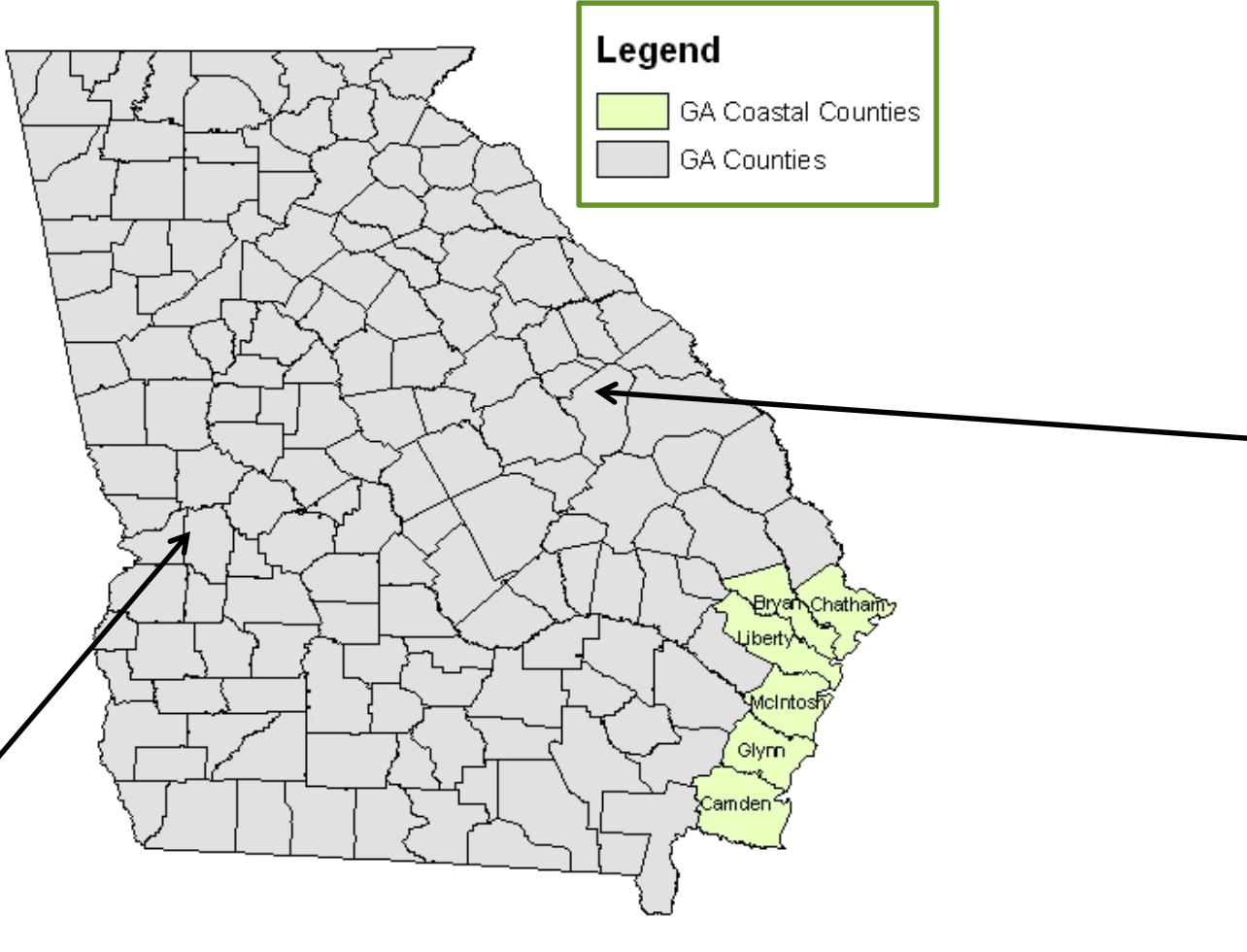


The Proportion of Coastal Exposure is Similar for Residential and Commercial Lines of Business

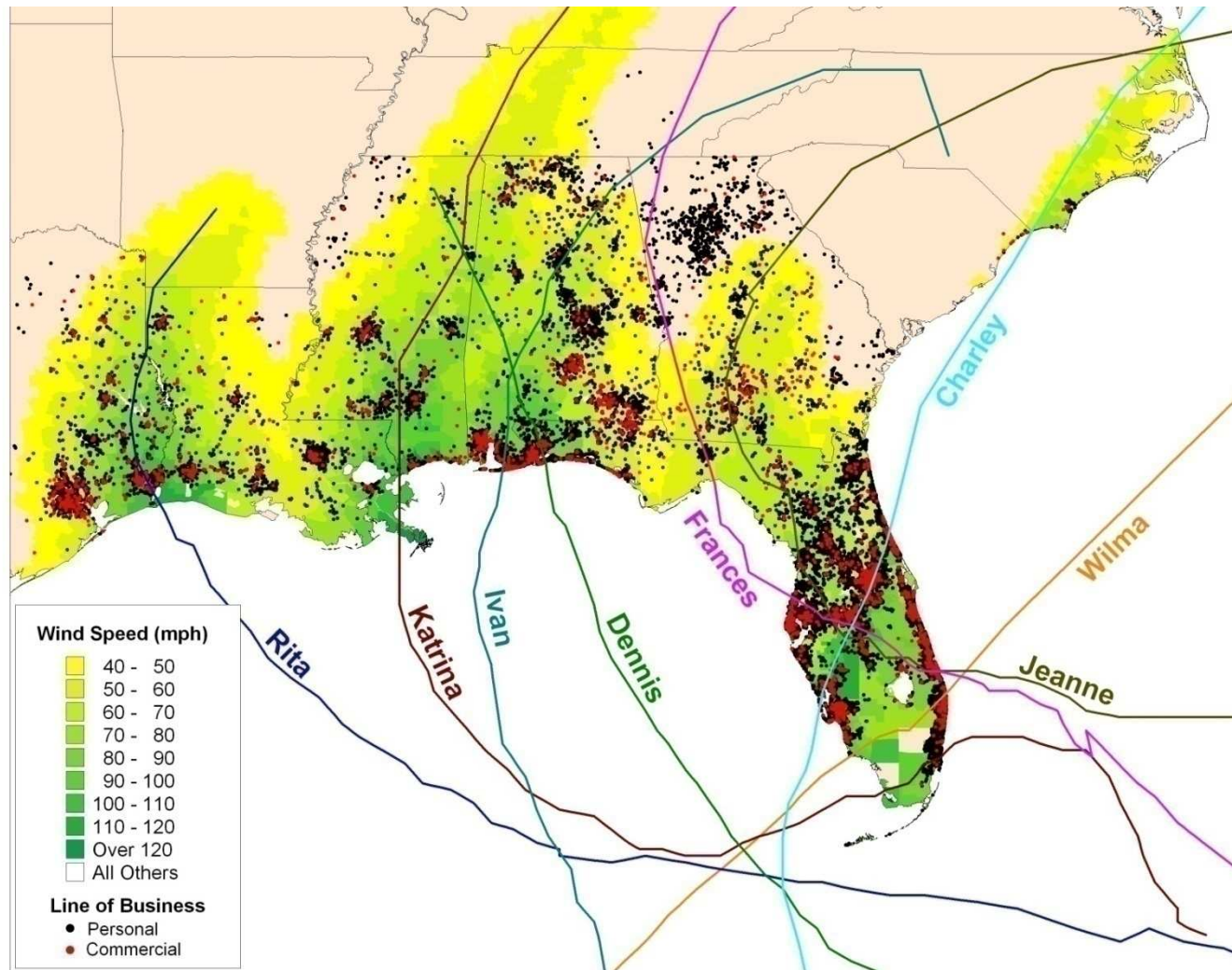
State	Residential Percent Coastal	Commercial Percent Coastal
Alabama	12%	12%
Connecticut	66%	61%
Delaware	37%	29%
Florida	79%	79%
Georgia	5%	7%
Louisiana	36%	39%
Maine	61%	54%
Maryland	1%	2%
Massachusetts	53%	55%
Mississippi	13%	14%
New Hampshire	24%	22%
New Jersey	33%	34%
New York	46%	69%
North Carolina	10%	8%
Rhode Island	38%	20%
S. Carolina	23%	28%
Texas	23%	27%
Virginia	10%	13%
All States Above	34%	41%
All States Above as % of Total U.S.	15%	18%



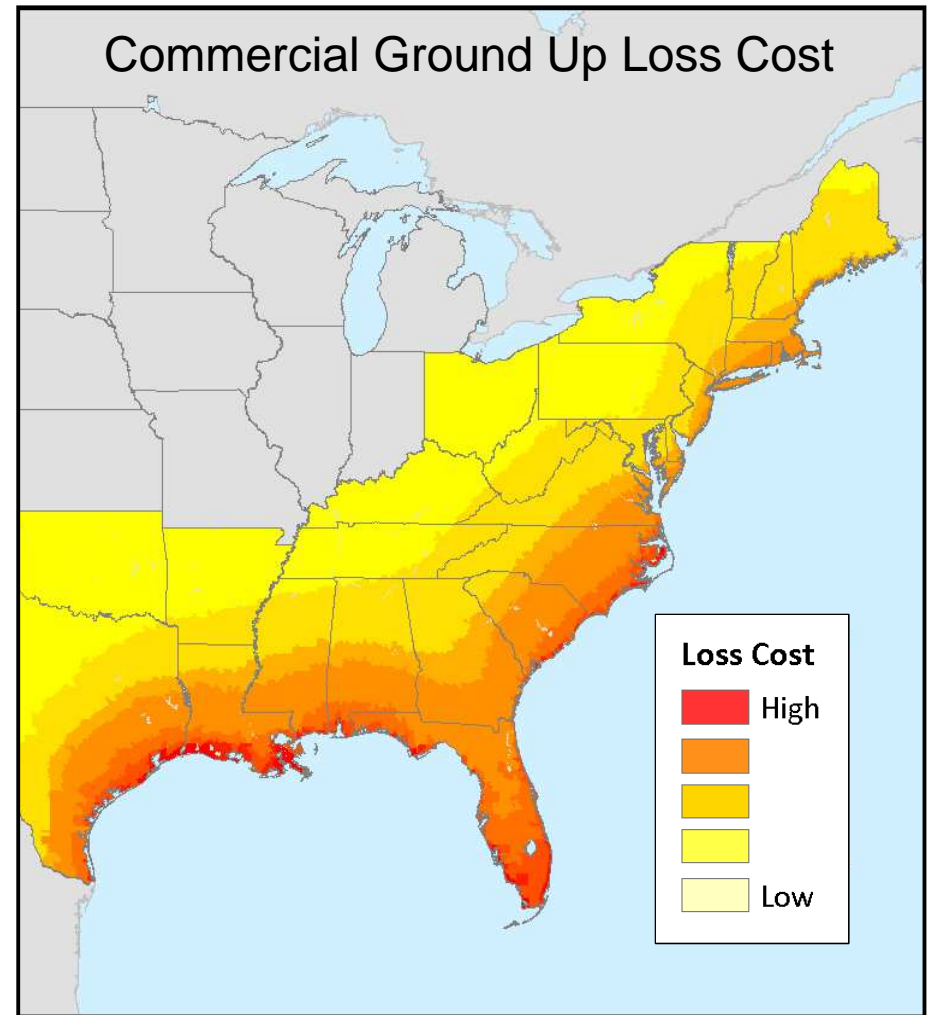
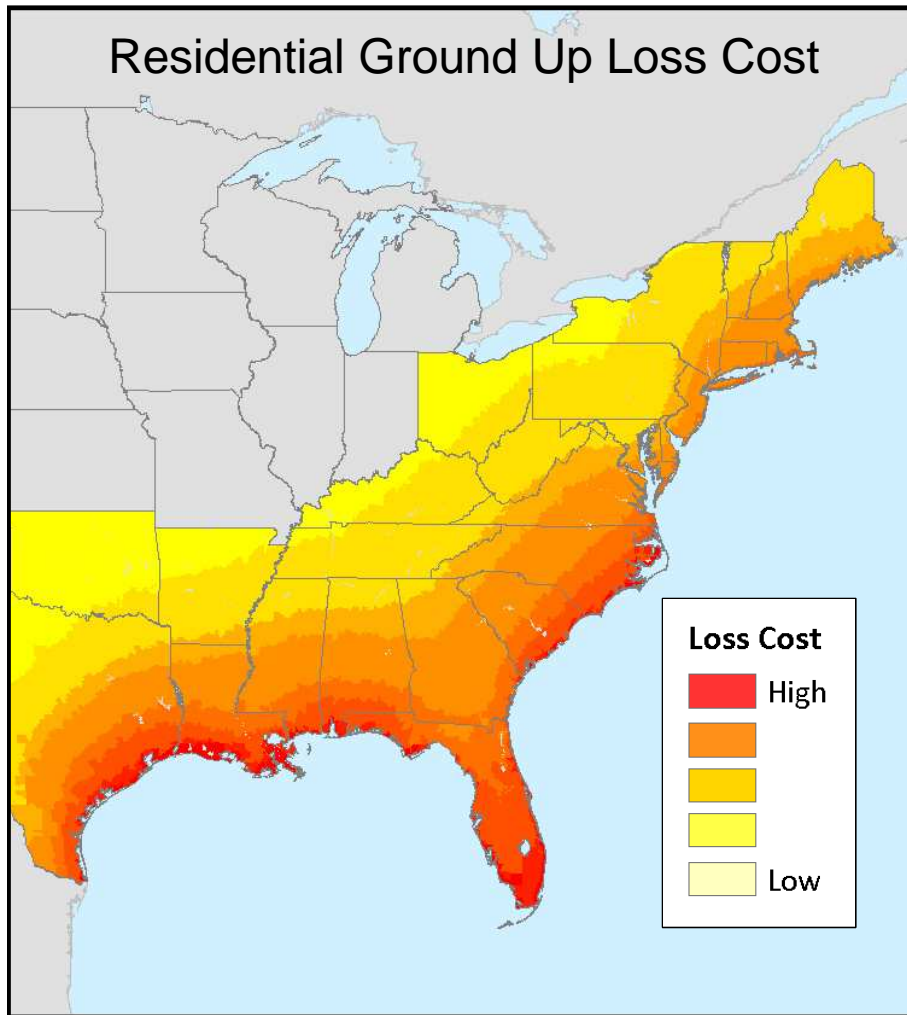
Georgia: Significant Inland Risk



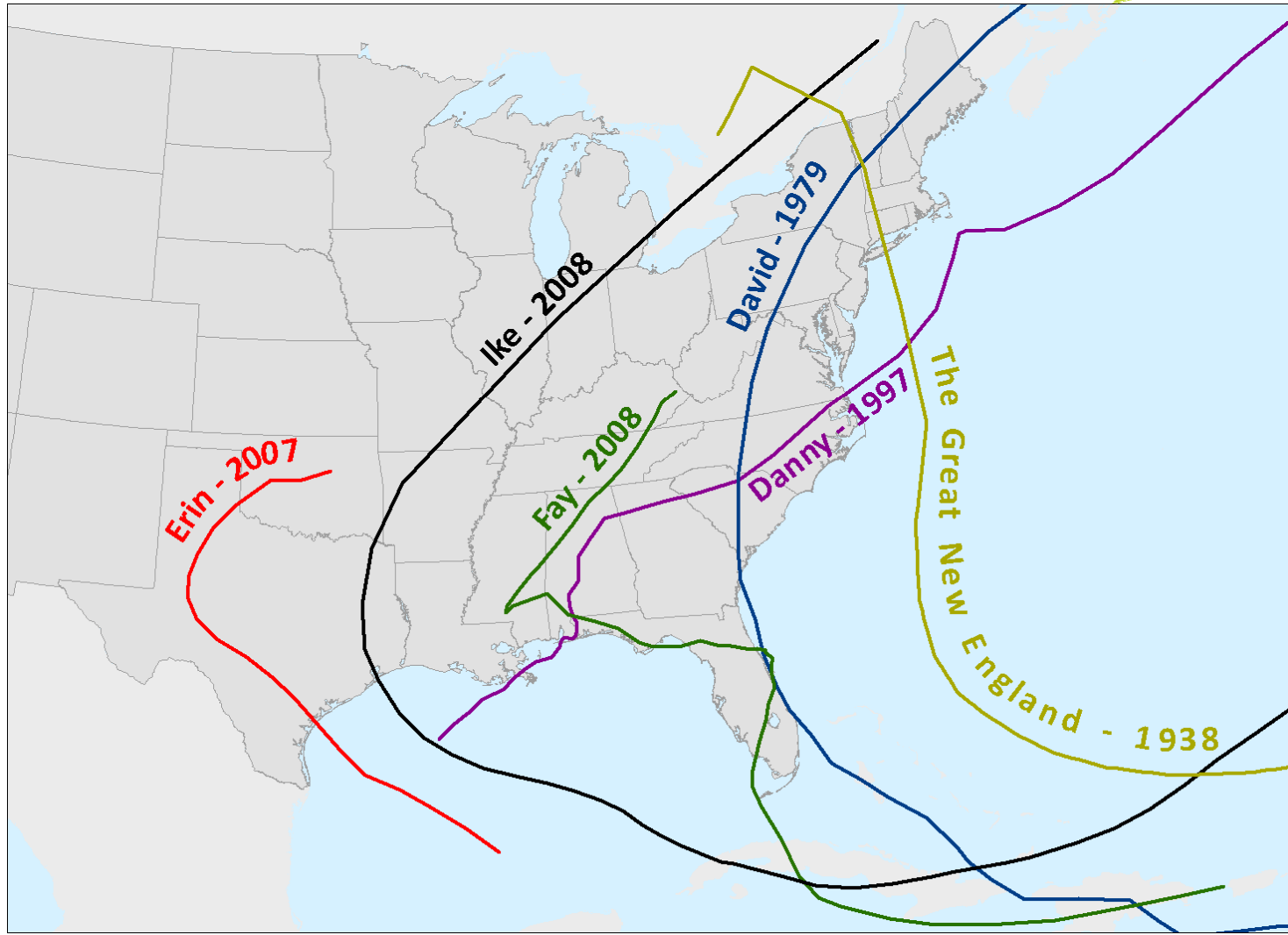
2004 and 2005 Claims Data Clearly Show Inland Loss Potential



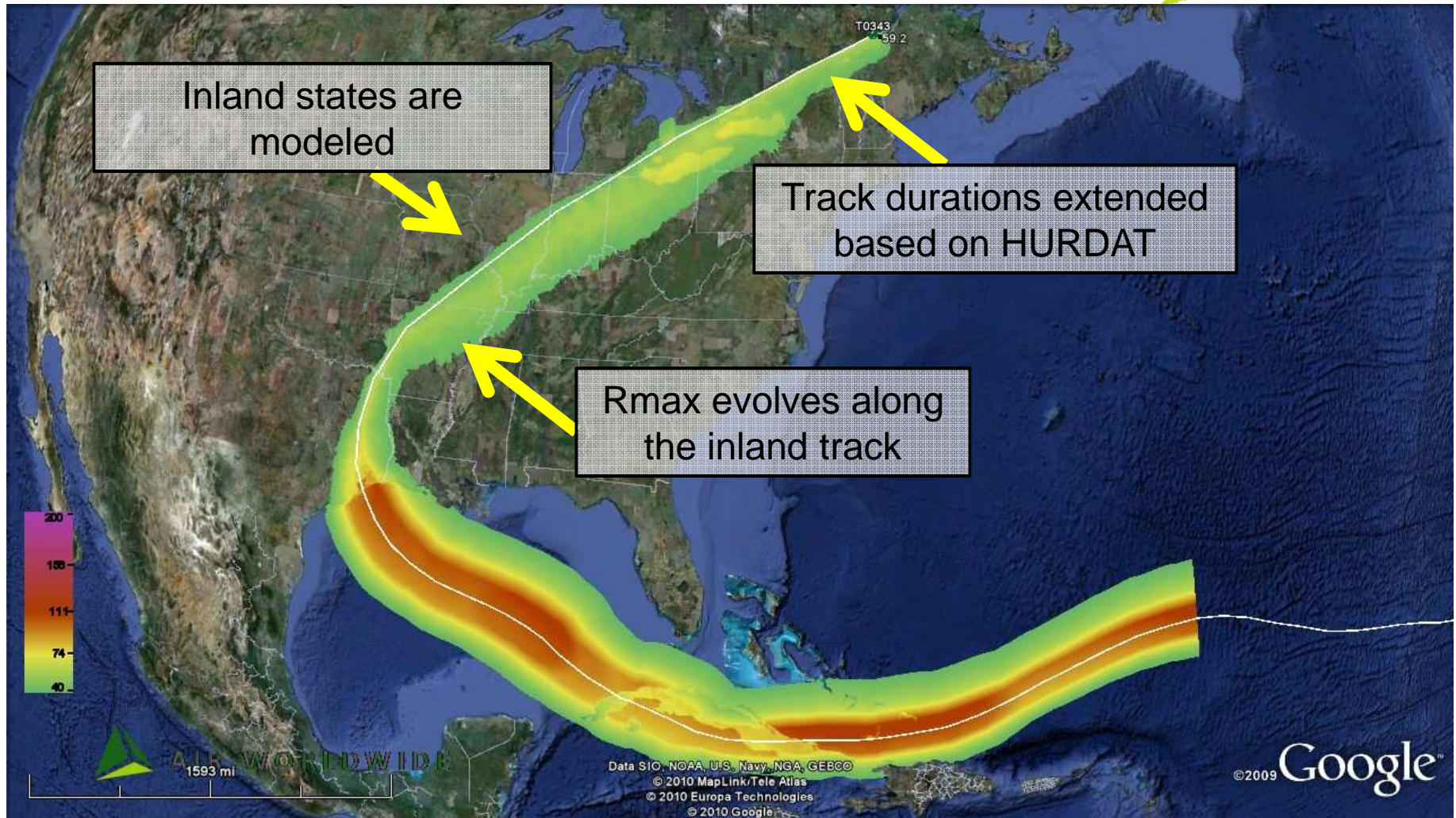
AIR Hurricane Model Realistically Captures Inland Residential and Commercial Losses



About 5 to 10 Percent of All Hurricanes Go Through Re-intensification



Lessons from Ike: Requirements for a Robust Model



Though Exposure is High in Coastal Areas, Significant Accumulation of Loss Can Occur Inland

	Estimated Ground Up Industry Loss		
	Ike	Opal	Katrina
Tier A ¹	19.5%	76.7%	32.7%
Tier B ²	55.2%	2.8%	52.9%
Tier C ³	12.1%	17.3%	11.6%
Tier D ⁴	13.1%	3.2%	2.7%
Tier E ⁵	n/a	n/a	n/a

¹ Zip codes whose zip code centroids are within 1 mile of the effective coastline

² Counties which touch the effective coastline, excluding Tier A areas

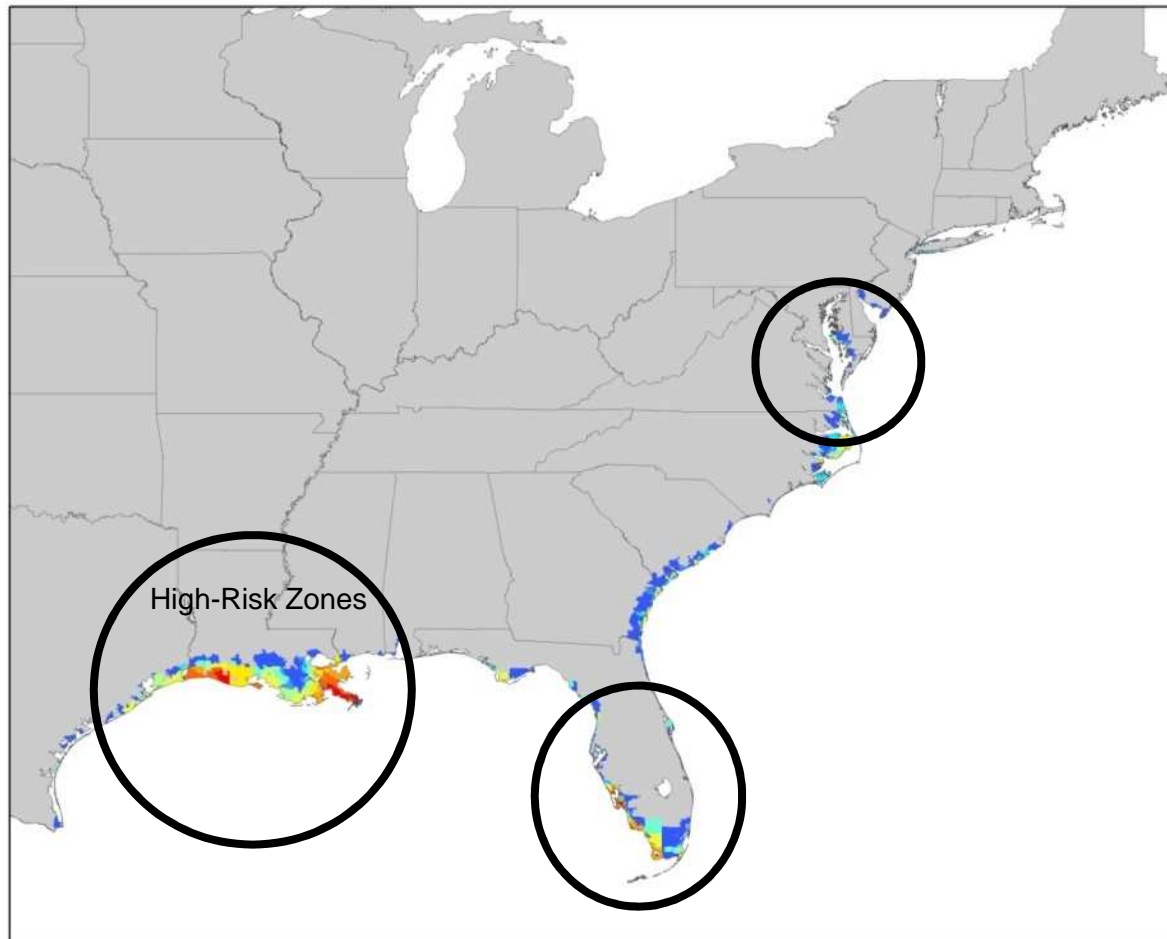
³ Coastal states, excluding Tier A and B areas

⁴ Inland HU states, Excluding Tier A, B and C areas (includes MO, IL and IN)

⁵ Remainder of country



Importance of Knowing Policy Conditions – Storm Surge



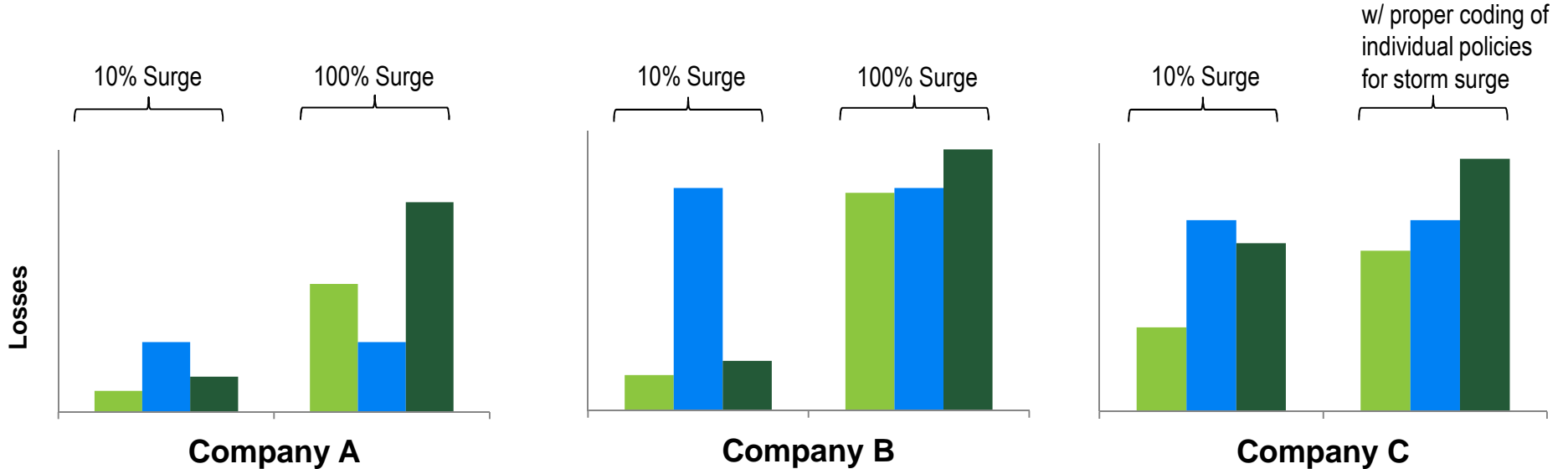
Storm Surge Risk using AIR US Hurricane Model

Modeled Loss Estimates are Highly Sensitive to Proper Coding of Policy Conditions

Unknown percentage of policies covering storm surge

High percentage of policies covering storm surge

Data coded to indicate which policies cover storm surge



- AIR Real-time Ike Scenario (Low Portfolio Loss)
- AIR Real-time Ike Scenario (High Portfolio Loss)
- Actual Portfolio Loss Experience



Source: Hurricane Ike: Performance of the AIR Model

Summary

- There is significant inland hurricane risk
- There is significant loss potential from storm surge
- Exposure aggregation should extend beyond coastal counties
- Using Catastrophe models with quality data provides a more robust view of risk and is the best approach to understanding catastrophe risk