

Actual versus Modeled Loss

A Review of the 2004 – 2005 Hurricane Seasons

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Agenda

- Perception of model performance
- How are real-time loss estimates used?
- How are real-time loss estimates created?
- Review of actual versus modeled loss
- Katrina – a challenging event
- Next steps

“No worries?”

- Exposure data
- Damage functions
- Policy interpretation risk
- Other exposures (marine, offshore energy)
- Demand surge

“No worries?”

- Use of average damage factor
 - Law of large numbers
- Geocoding accuracy
- Granularity of environmental data
- Wind speed interpolation
- Sub-perils (# tornados spawned, fire following)

Reactions to 2004/2005 season

- Models perceived as doing poorly
- Pre-landfall versus post-landfall estimates
- Measures of model performance
 - Comparison of actual to modeled portfolio loss
 - Actual loss compared to probabilistic results
- Non-modeled loss
- Changes in the models

Real-time Loss Estimates

How can real-time loss estimates be used?

- To assist companies in planning deployment of claims adjusters
- To help companies advise their Board of Directors, shareholders, reinsurers and rating agencies of estimated losses
- They can be used to understand the likelihood of impacting an existing reinsurance program and assessing the need for additional reinsurance coverage
- To identify policyholders to receive pre-event communication regarding loss control measures that can be taken before, during, and after an event

How AIR Generates Loss Estimates for ALERT

- AIR's ALERT estimates are the result of simulations of the actual event as opposed to identifying similar events from the stochastic catalog
- ALERT postings are developed as follows:
 - Obtain real-time data on the event from sources such as the National Hurricane Center
 - Using the event data as inputs, probabilistically model up to several hundred scenarios for the storm's future progress
 - Scenario events run against industry exposure database to estimate losses
 - Develop event sets for use in both CATRADER and CLASIC/2
 - Publish this data to the ALERT website and notify clients
- Final loss estimate is posted after review of area
- Losses from CatTrader (market share model) as reasonableness check

RMS Real-Time Hurricane Modeling Information

Tropical Depression develops in Atlantic



RMS Storm Watch 24-hour monitoring and website updates



Develops into CAT 1 Hurricane



24-hour monitoring, RMS CAT Updates published with meteorological and forecast information, updated modeling parameters, and client email notifications



Landfall



RMS CAT Updates published with post-landfall stochastic modeling parameters and storm footprint, damage analysis, and loss estimates. Reconnaissance underway within 24 hours. Ongoing data collection and website updates.

RiskOnline™
3-hourly updates for probabilistic loss estimates

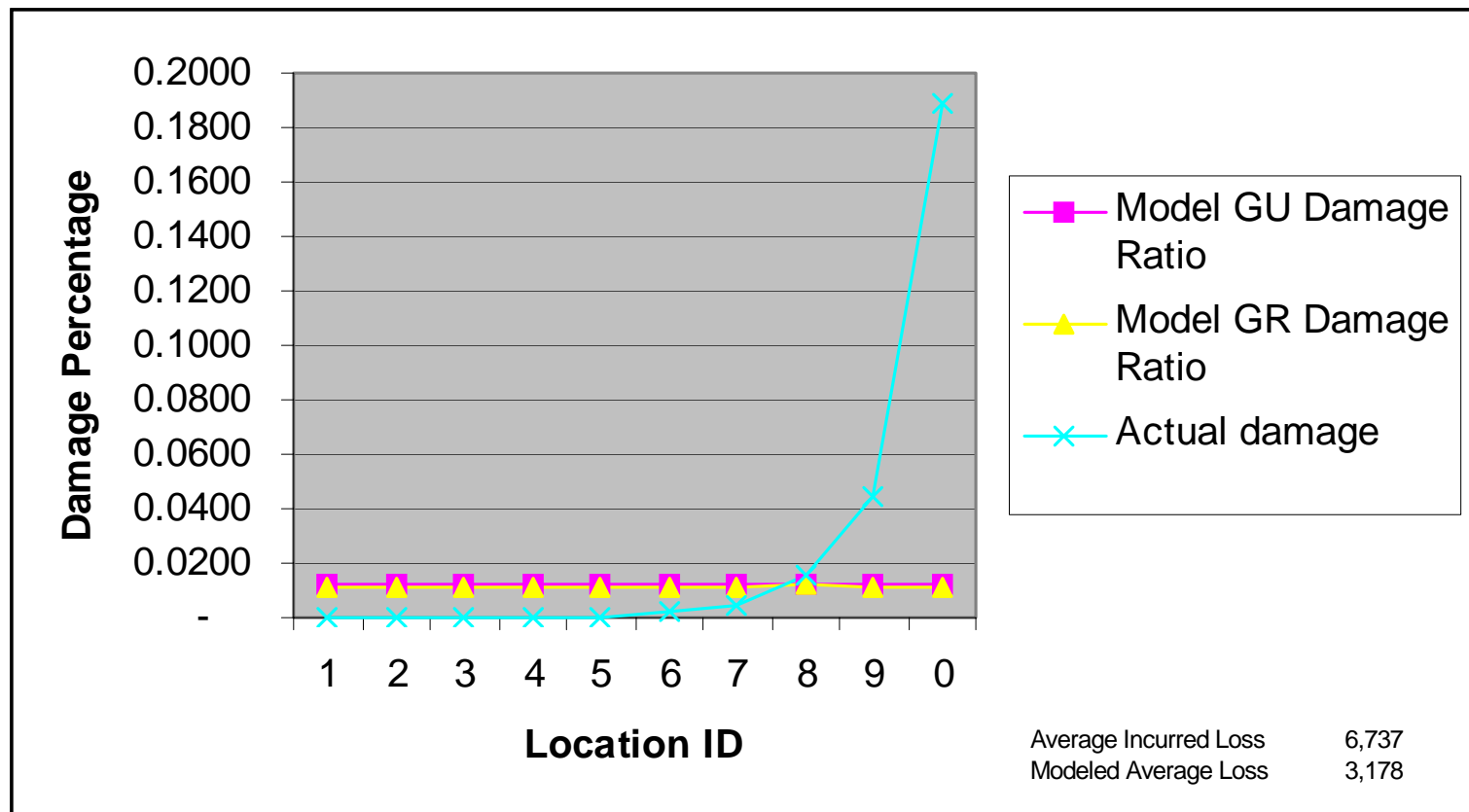


EQECAT

- EQECAT identifies a subset of events from their stochastic library that reflect the range of possible tracks and storm parameters
- Event sets are transmitted on a daily basis beginning when the storm is still about 3 days from landfall
- Post-event footprint typically issued hours after first landfall
- Field investigations focused on collecting information for future model improvement

Models do not predict losses at individual locations

- Models rely on law of large numbers
- Apply average damage factor to all locations with same windspeed
 - Actual results will vary from house to house



Hurricane Charley – Locations with Peak Gust wind speed = 97.1

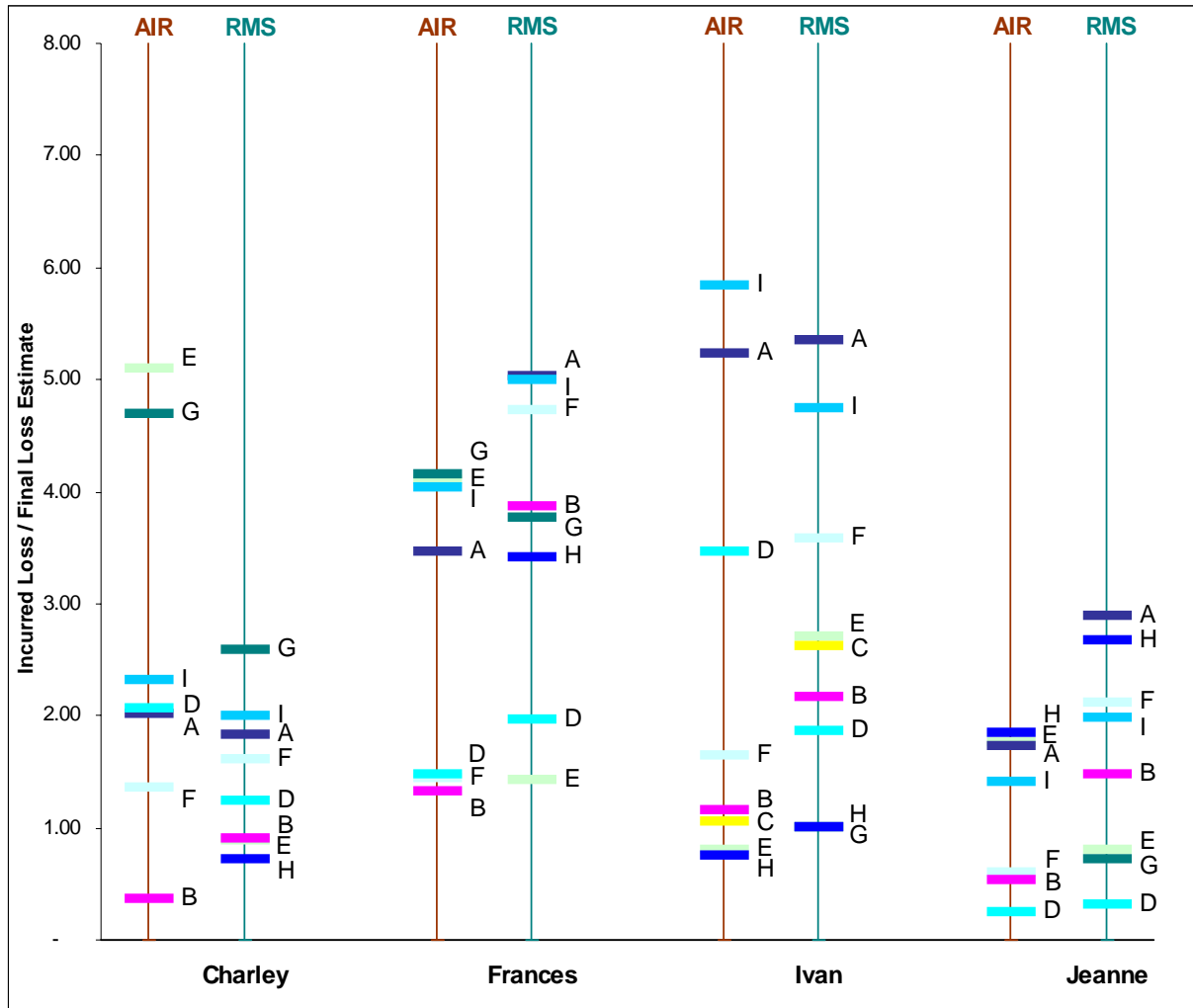
We reviewed actual versus modeled for several clients

	Geography	Business Type	Total Hurricane Exposed Value
Company A	Writes in most hurricane exposed states; 30% exposures in Gulf region and Florida	Mostly commercial	~\$50B
Company B	Writes in most hurricane exposed states; 25% exposures in Gulf region and Florida	60% commercial, 40% personal	~\$110B
Company C	Writes in most hurricane exposed states; 40% exposures in Gulf region and Florida	50% commercial, 50% personal	~20B
Company D	Writes in Gulf region and Florida	70% commercial, 30% personal	~15B

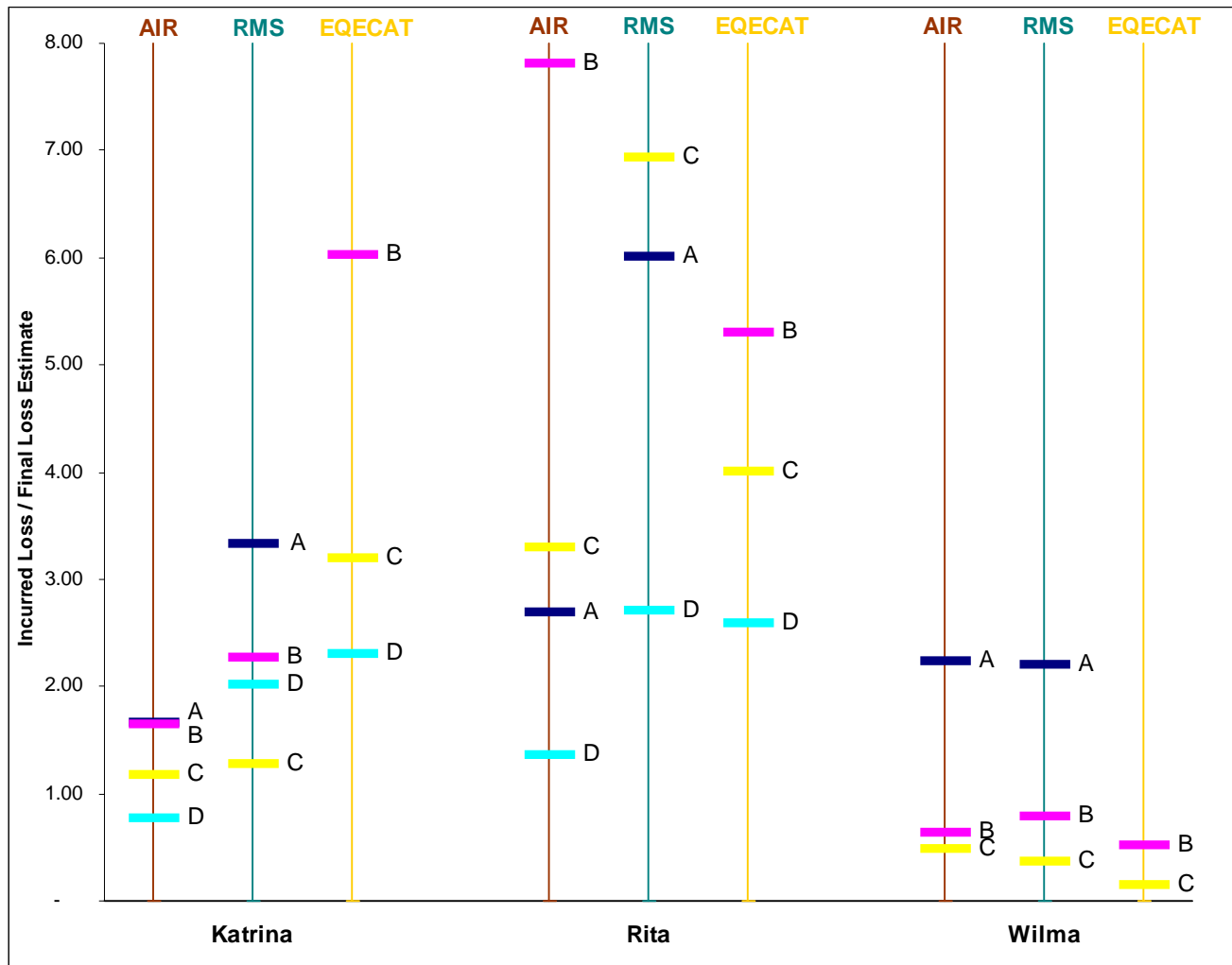
Notes regarding the following exhibits

- 2005 loss estimates from companies are a moving target. Particularly for Katrina, we may not know the final number for some time
- Loss estimate methodologies
 - AIR and RMS loss estimates include storm surge. They do not include demand surge, flooding, or any other adjustment
 - EQECAT numbers include demand surge, but not storm surge or flooding

Model performance for 2004



Model performance for 2005

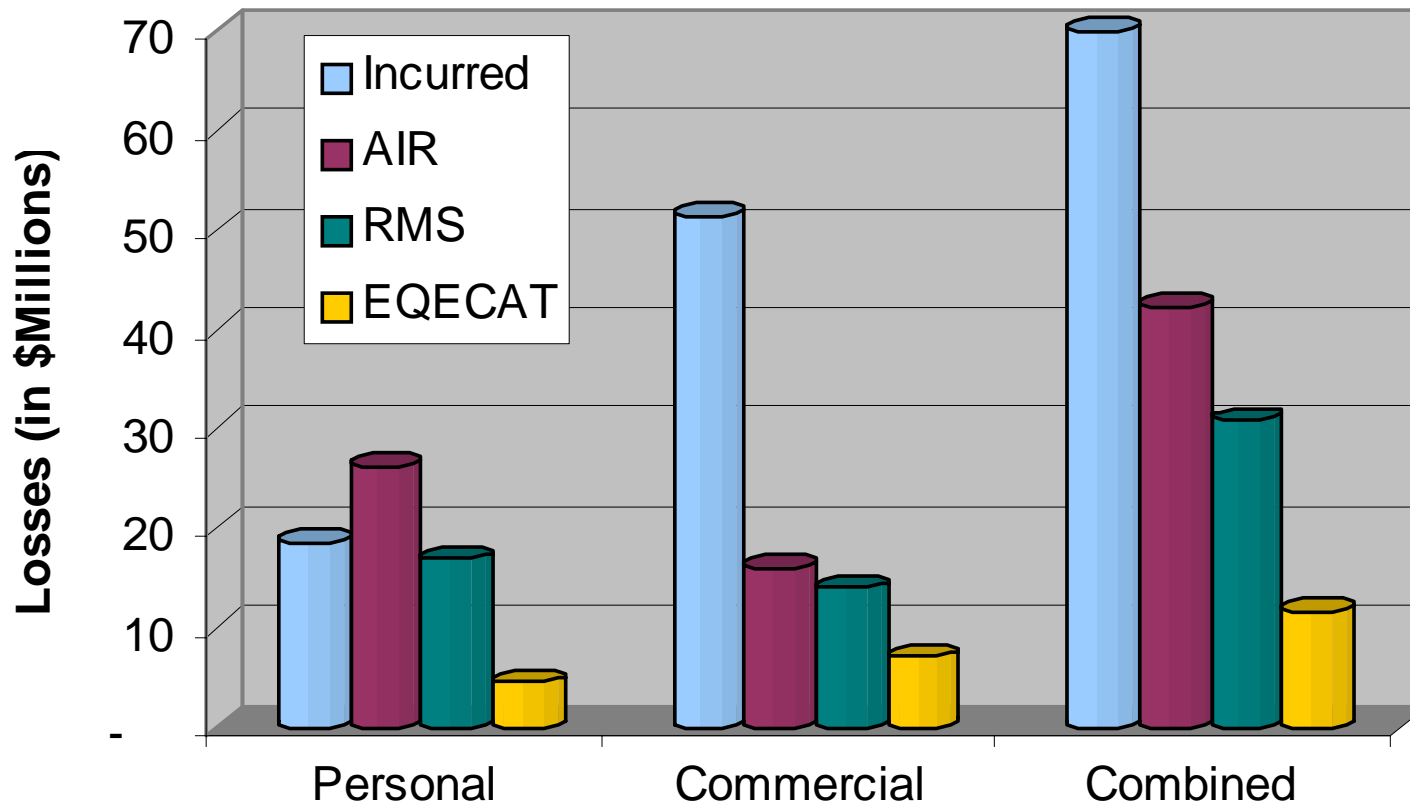


For Rita, the incurred for Company B was 130 times the RMS modeled loss

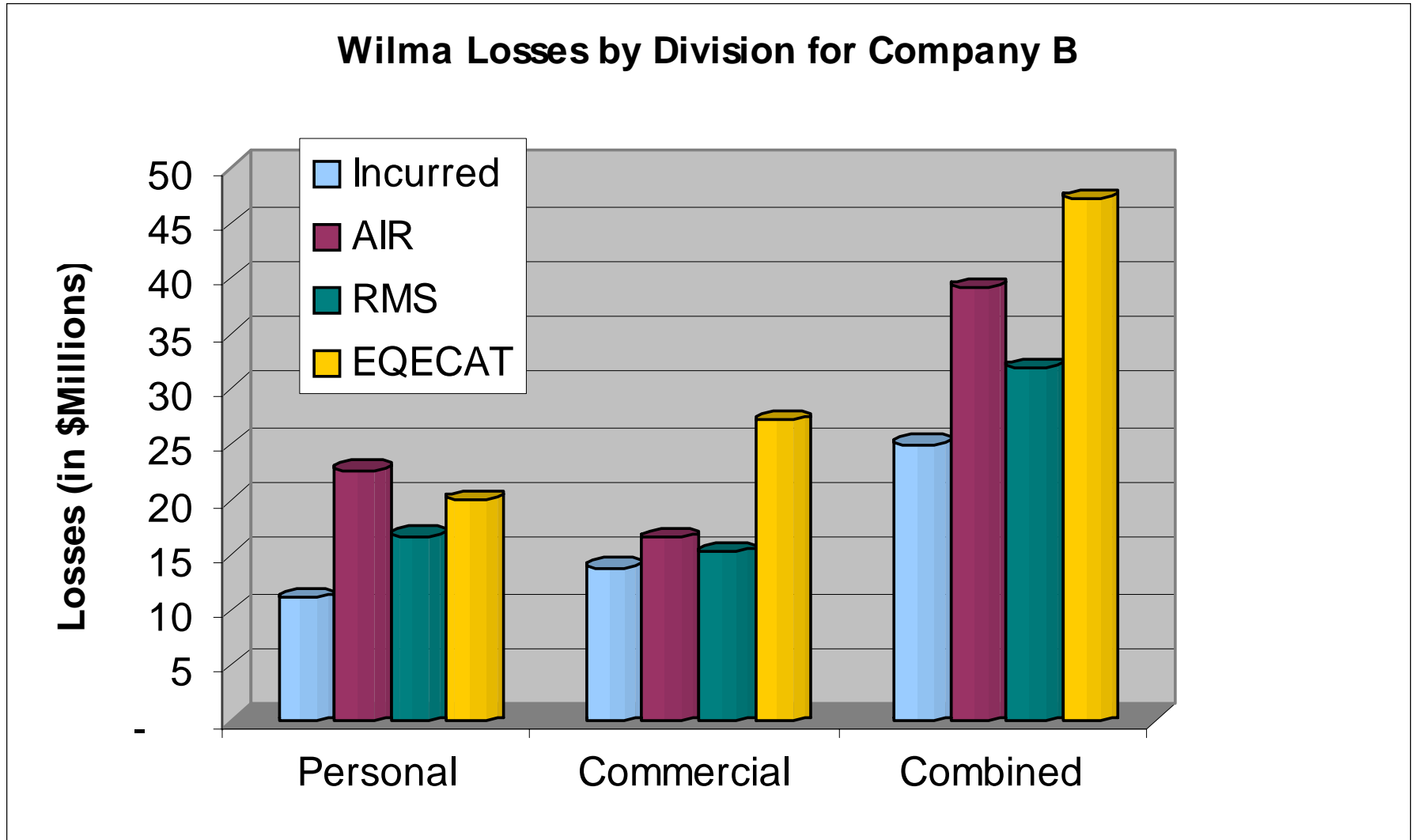
EQECAT Results were not available for Company A

Performance varied by line of business

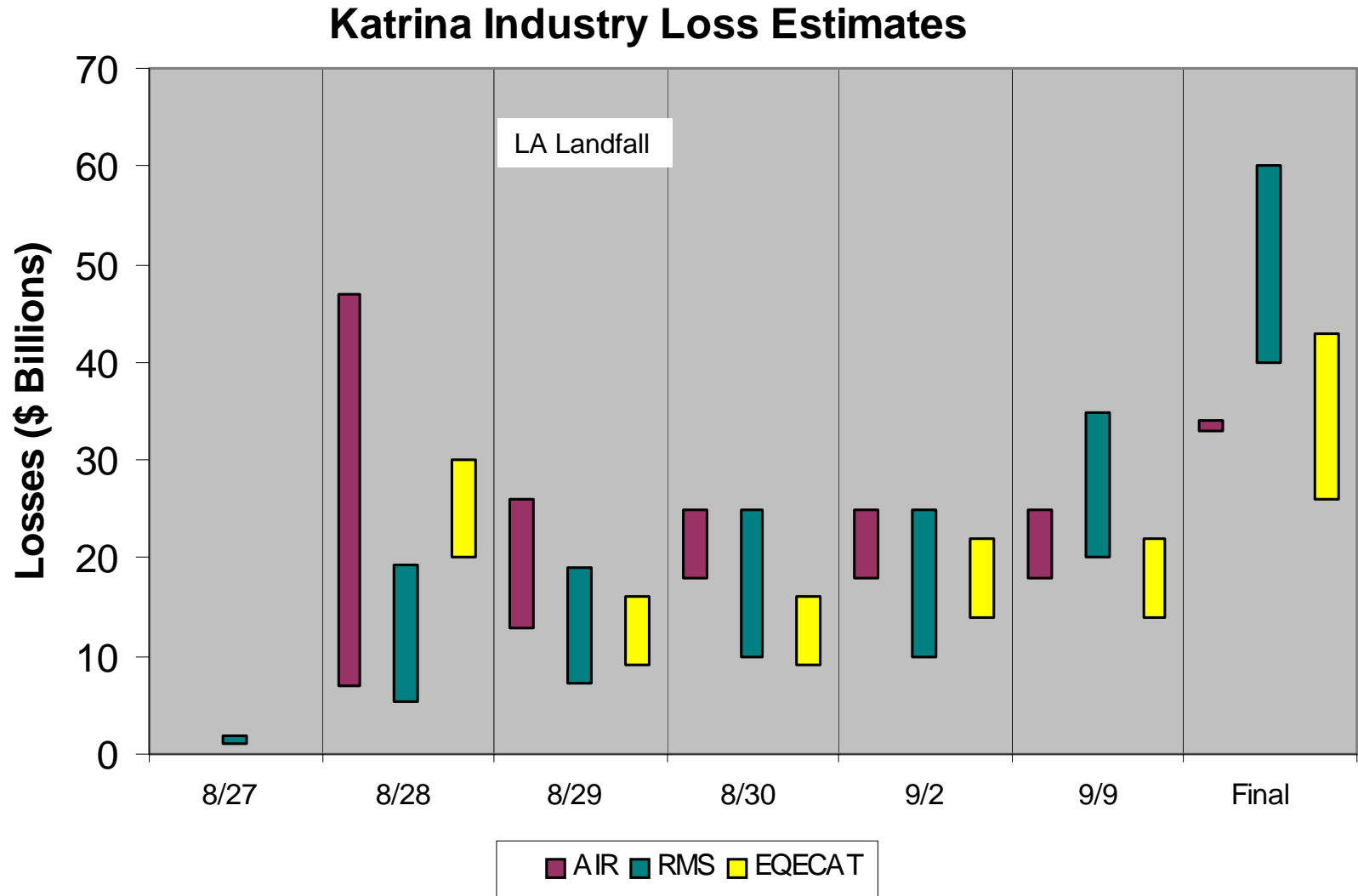
Katrina Losses by Division for Company B



Performance varied by line of business

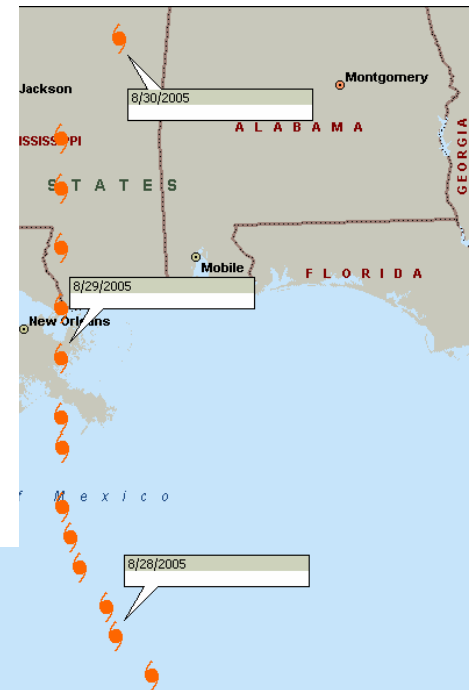
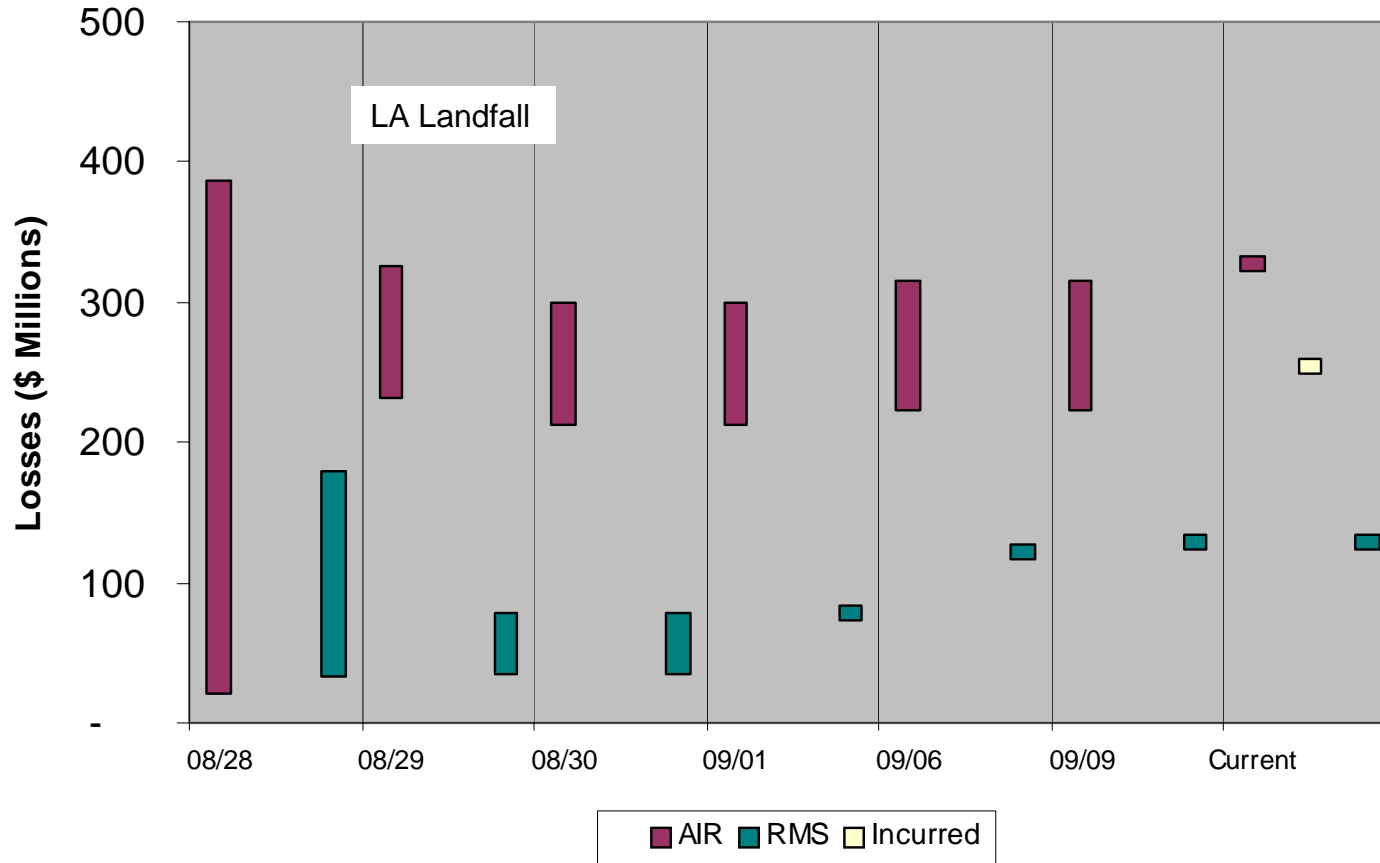


Estimates vary as time of landfall approaches



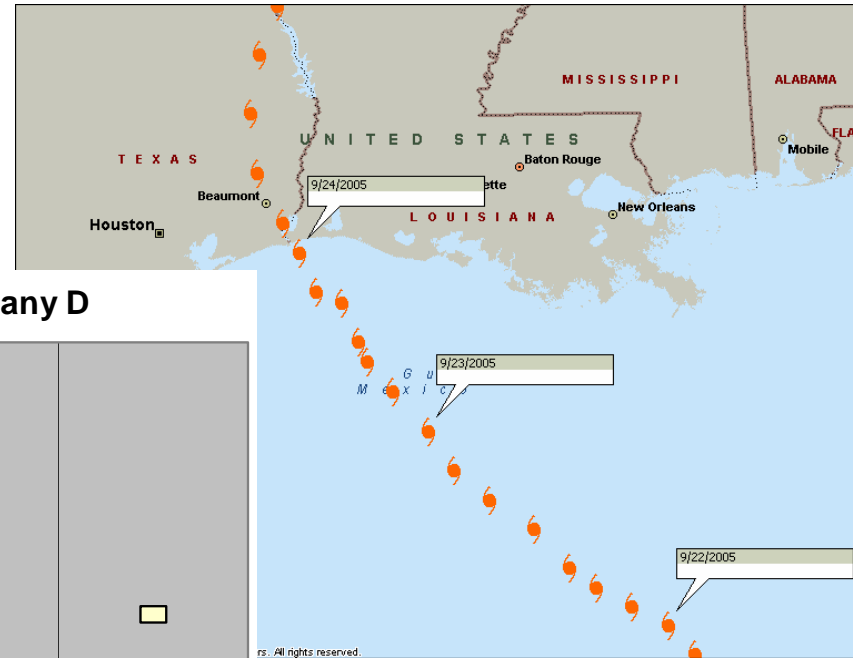
Range of loss estimate over time

Katrina Loss Estimates Over Time for Company D

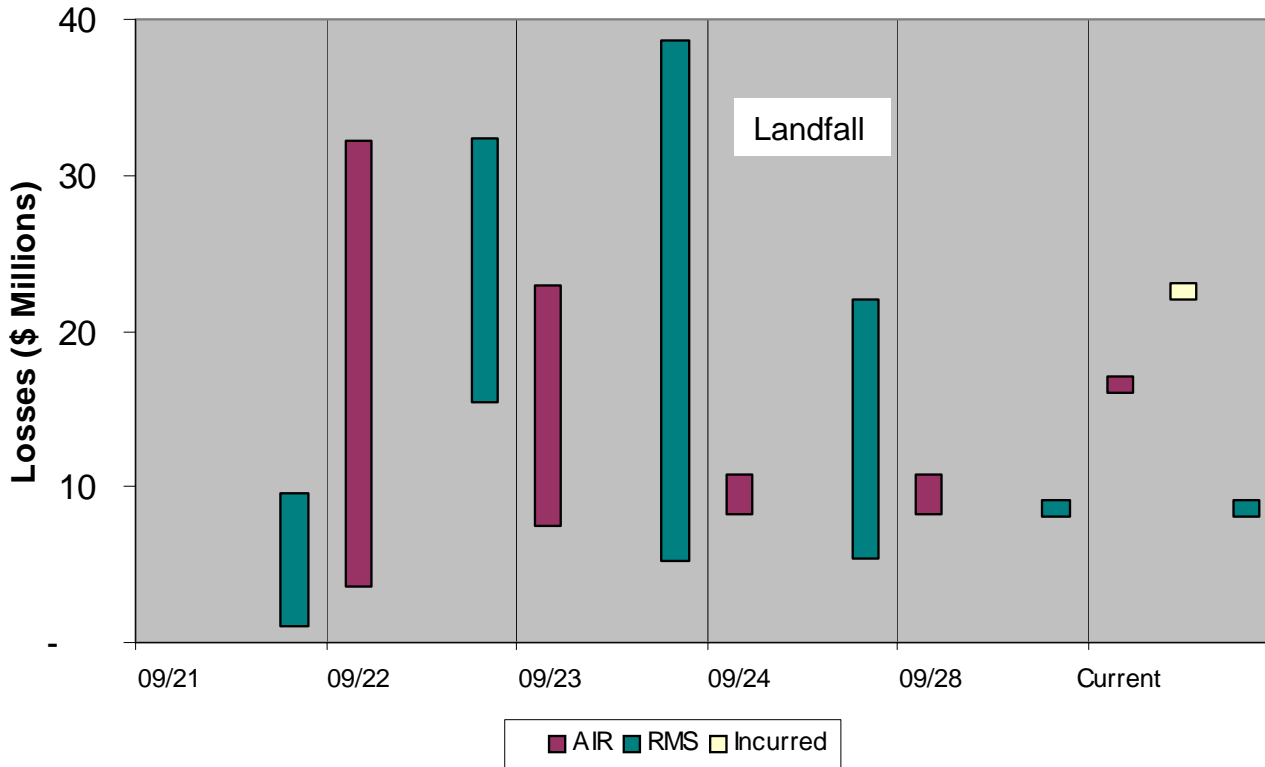


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Range of loss estimate over time

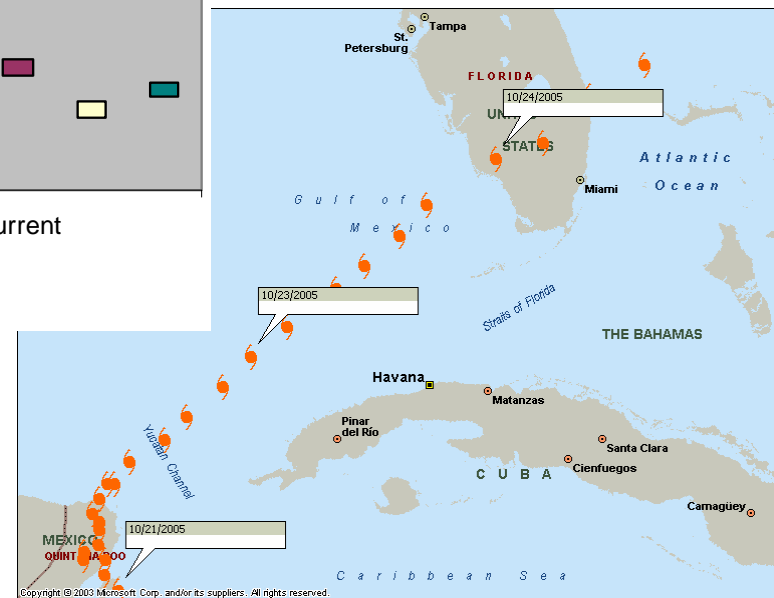
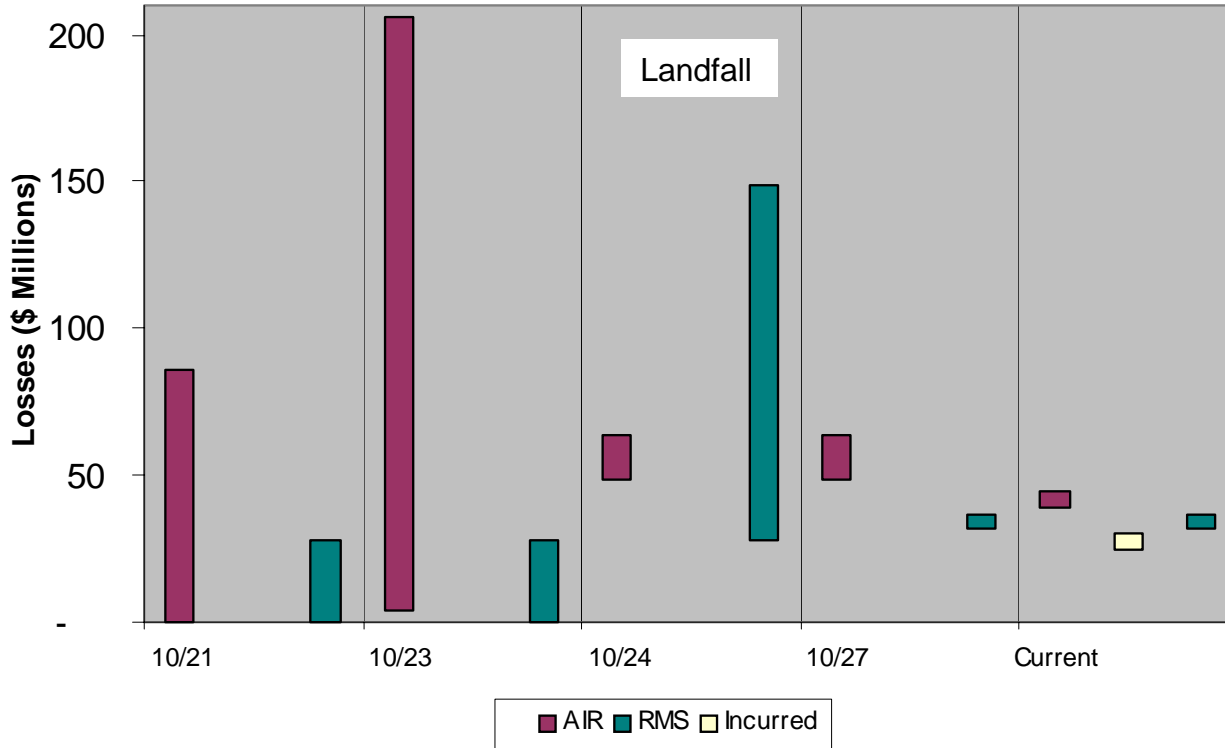


Rita Loss Estimates Over Time for Company D



Range of loss estimate over time

Wilma Loss Estimates Over Time for Company B



Katrina — a challenging event

Construction quality:

- Tended to run into lower than anticipated, which translated into higher damages
- Underwriters have commented that Katrina's winds should not have done so much damage to certain risks – but they did

Katrina — a challenging event

- Displacement of insureds for an extended period made timely inspections difficult, adding complexity to ALE and Business Income claims

Business income claims:

- Determining the period of restoration is usually calculated based on the time it takes to repair covered damages. In Katrina, many businesses are not motivated to re-open due to the lack of general commerce in New Orleans (there isn't much business being transacted because many have not returned).
- The period of restoration can be extended due to non-covered circumstances. In Katrina's case the flooding has made it difficult to separate covered loss from non-covered loss and reach a settlement with the insured.

Katrina — a challenging event

- Accurate projections on exposures were difficult due to the unique characteristics of this hurricane:
 - Flooding (flood vs. covered water damage)
 - Evacuation created contact, reporting and inspection delays
 - Restricted entry to areas delayed damage assessment
 - Early evidence (modeling, satellite imagery) didn't support the actual extent of wind damage
- No pattern in damages from one risk to another, or territorially

Katrina — a challenging event

- Broussard's Restaurant — located in the French Quarter where there was no flooding. Incurred over \$500,000 in estimated damages (\$150,000 in business income)
- “The exterior of a wax museum in the French Quarters was inspected. The museum is located within a block of Broussard's and it was a no-claim. From the exterior it was difficult to see any difference initially in construction and damages. The roof on Broussard's did not hold up, the one on the wax museum did.”

Next steps — Modelers

- 2006 model revisions will address several shortcomings discovered during the review of 2004 and 2005 events
 - Light construction damage curve will be increased
 - RMS is adjusting modeling time frame to next 5 years
 - AIR is emphasizing improved data and use of a market share model
 - EQECAT to provide both near term and long term view of hurricane frequency and severity
 - Modeling firms will continue review of demand surge and other non-modeled losses

Next steps — Insurers and reinsurers

- Load models for non-modeled loss
- Perform scenario analysis to review risk in concentrated area
- Examine aggregate exceeding probability results
- Consider additional reinsurance limit
- Evaluate impact of model changes
- Study impact of changes in A. M. Best BCAR stress test
- Use interactive mapping tools to track exposure concentrations
- Keep models in perspective