

# Economic Sustainability & the Financing of Catastrophe Risk

**Hurricane Science for Safety Leadership Forum  
Orlando, FL**

**December 4, 2008**



**Download at:**

**[www.iii.org/media/presentations/hurricanesustainability](http://www.iii.org/media/presentations/hurricanesustainability)**

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# How Stretched is the Government's Balance Sheet?

*Financial Crisis Forces*



*Fiscal Prioritization*

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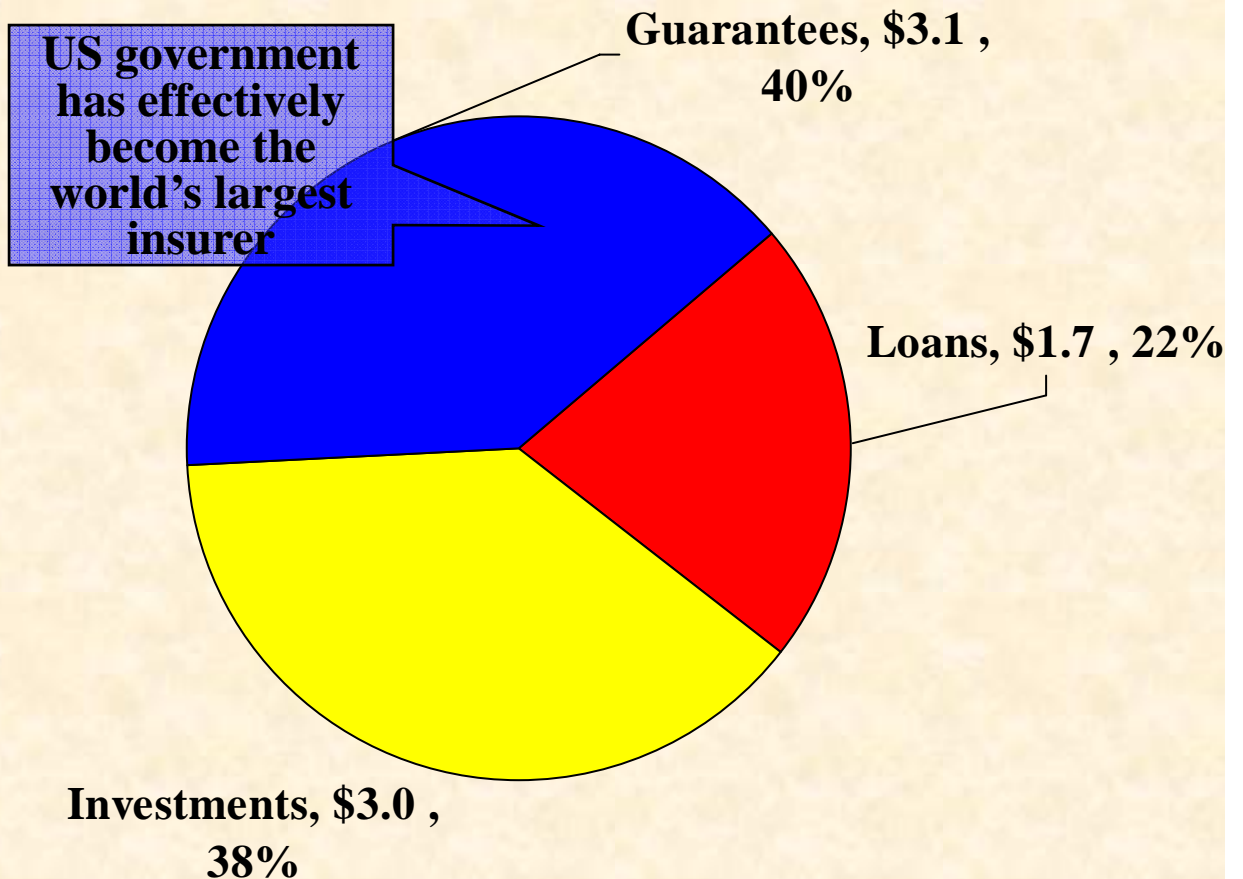


# Government Has Committed \$7.8 Trillion So Far to Financial Services Bailout\*

## Anatomy of the Bailout

- **Guarantees**: Govt. is guaranteeing corporate bonds, money market funds and money in some deposit accounts
- **Investments**: Govt. has purchased corporate stock and corporate debt and will buy mortgages
- **Loans**: Companies are borrowing from the government, using hard-to-sell (illiquid) securities as collateral

**\$ Trillions**



\*As of 12/1/08.

Sources: US Treasury Department; Federal Reserve; *New York Times*, "US Plans \$800 Billion in Lending to Ease Crisis," by Edmund Andrews, 11/26/08, p. A1; Insurance Information Institute research;

# The Dollars and Sense of Hurricane Risk:

*An Insurance Industry*

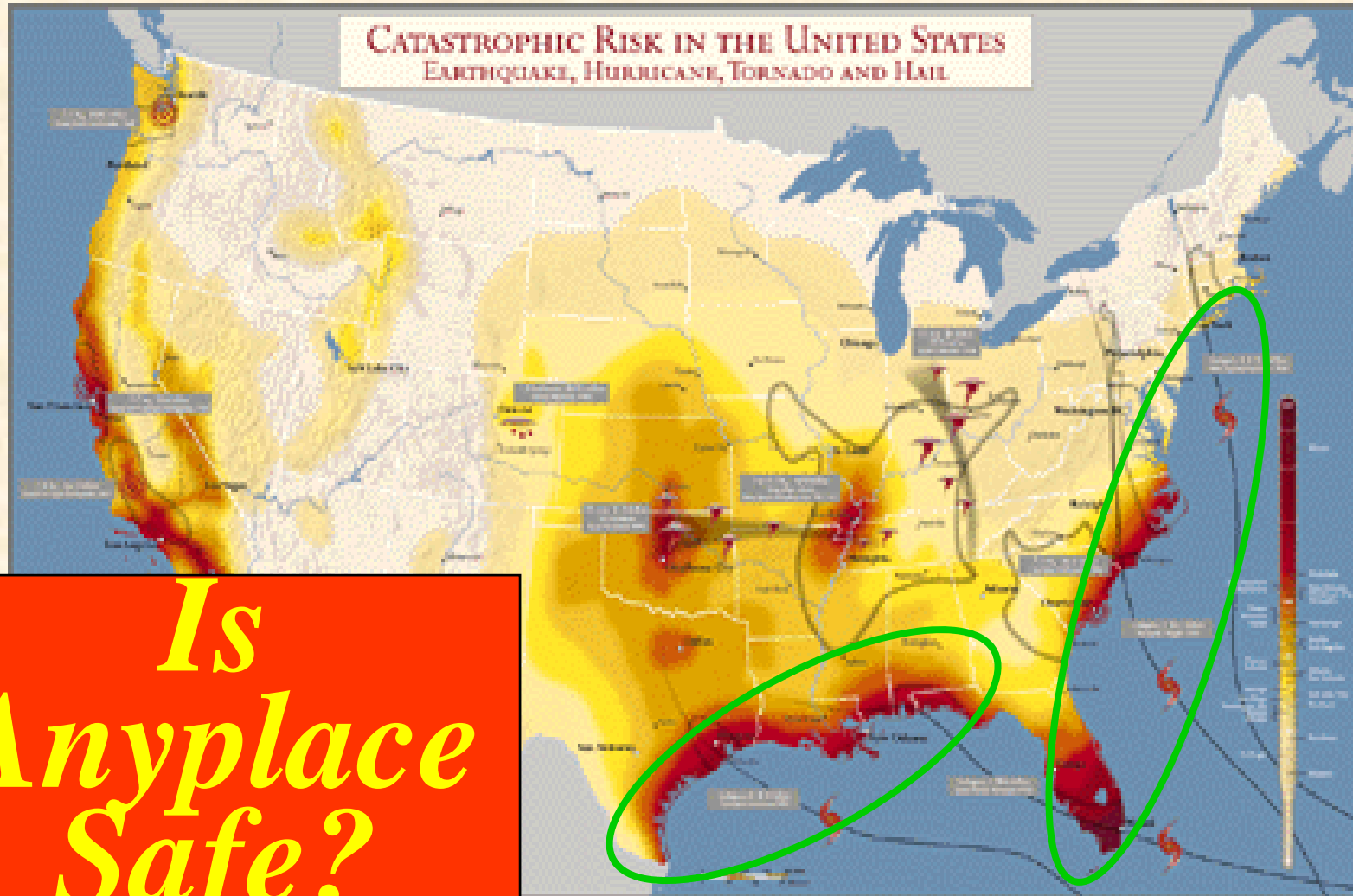


*Perspective*

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# *Most of US Population & Property Has Major CAT Exposure*

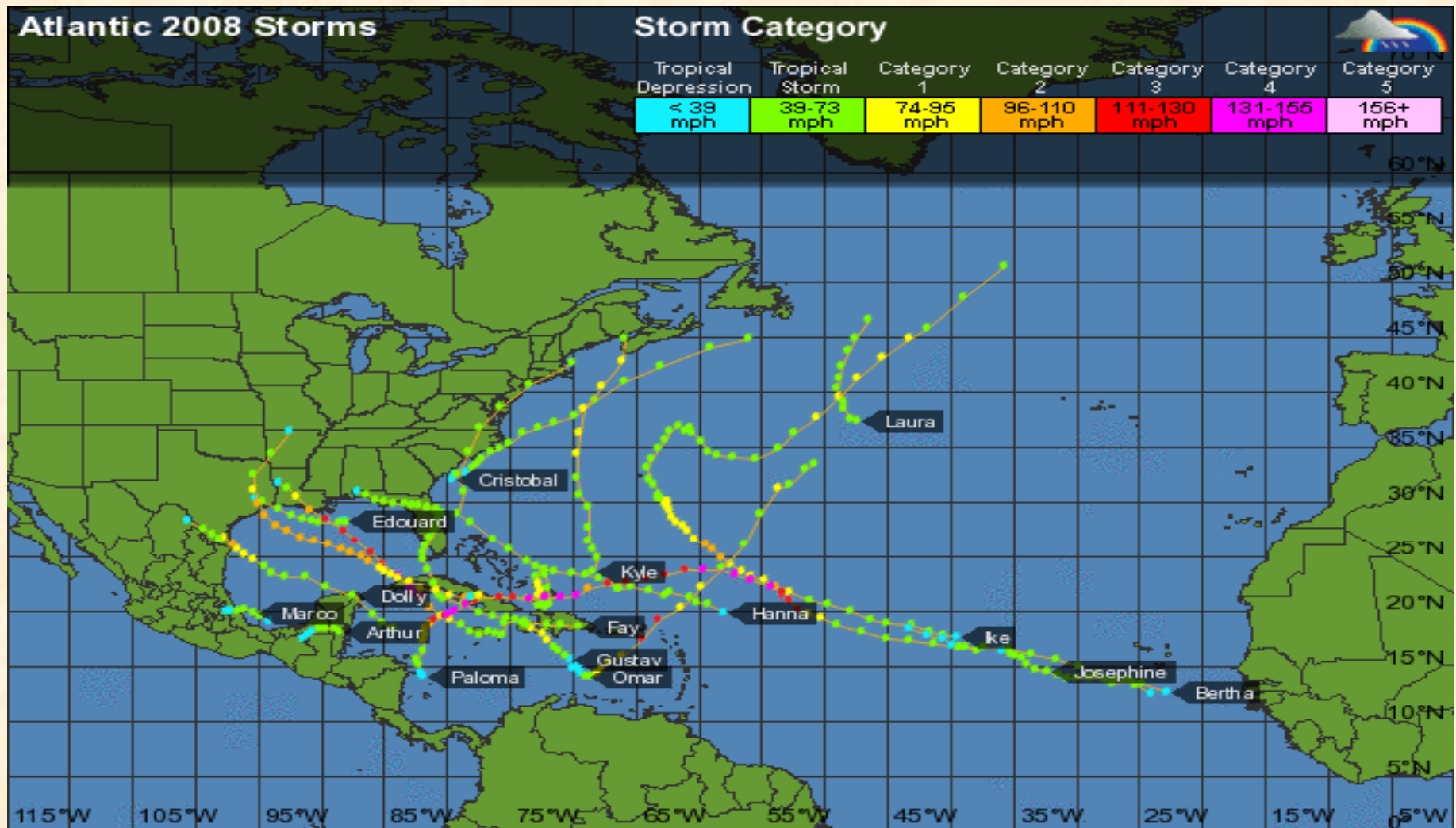


*Is  
Anyplace  
Safe?*

Source: AIR Worldwide



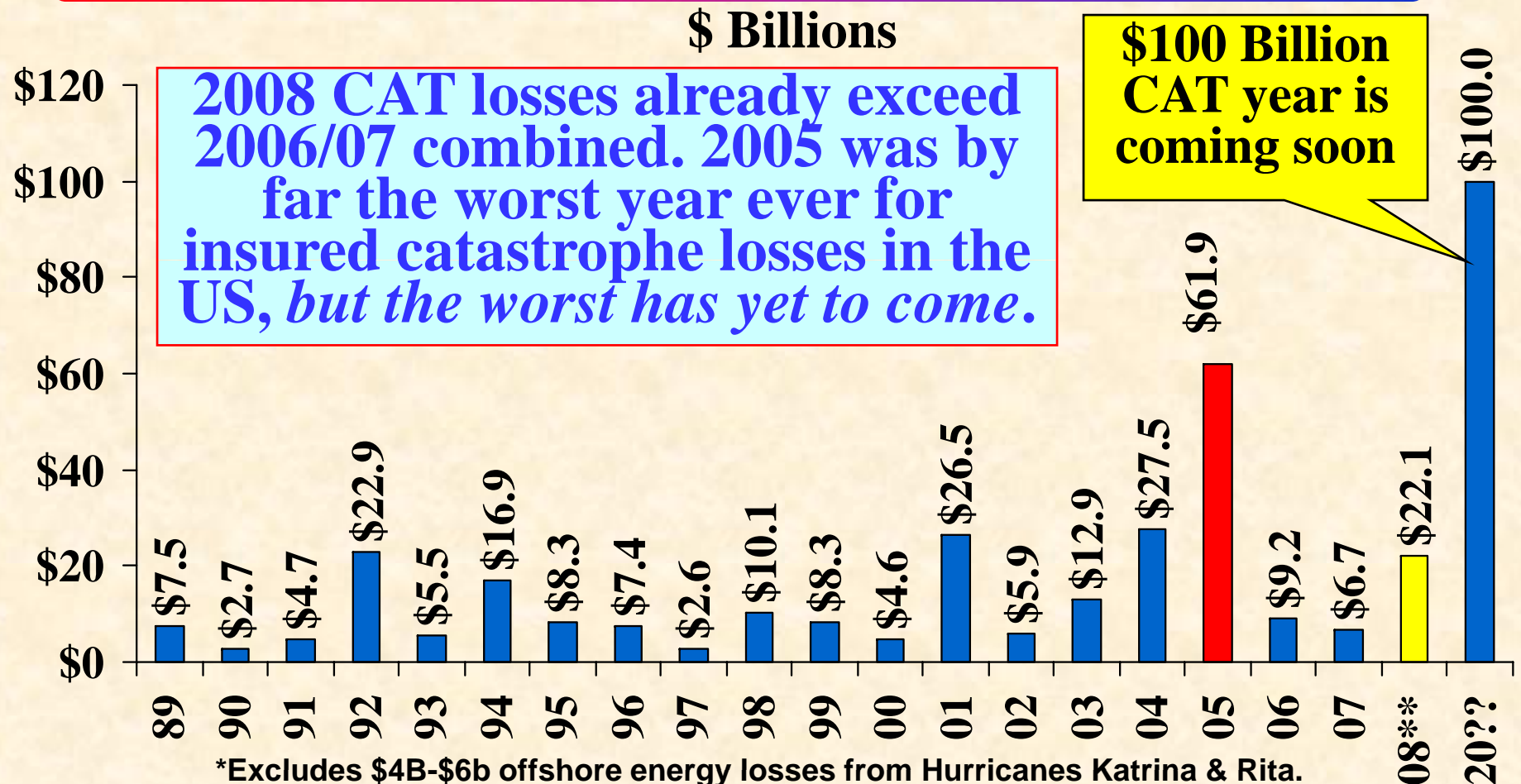
# 2008 Was a Very Active and Destructive Hurricane Season



Source: Wunderground.com



# U.S. Insured Catastrophe Losses\*



\*Excludes \$4B-\$6b offshore energy losses from Hurricanes Katrina & Rita.

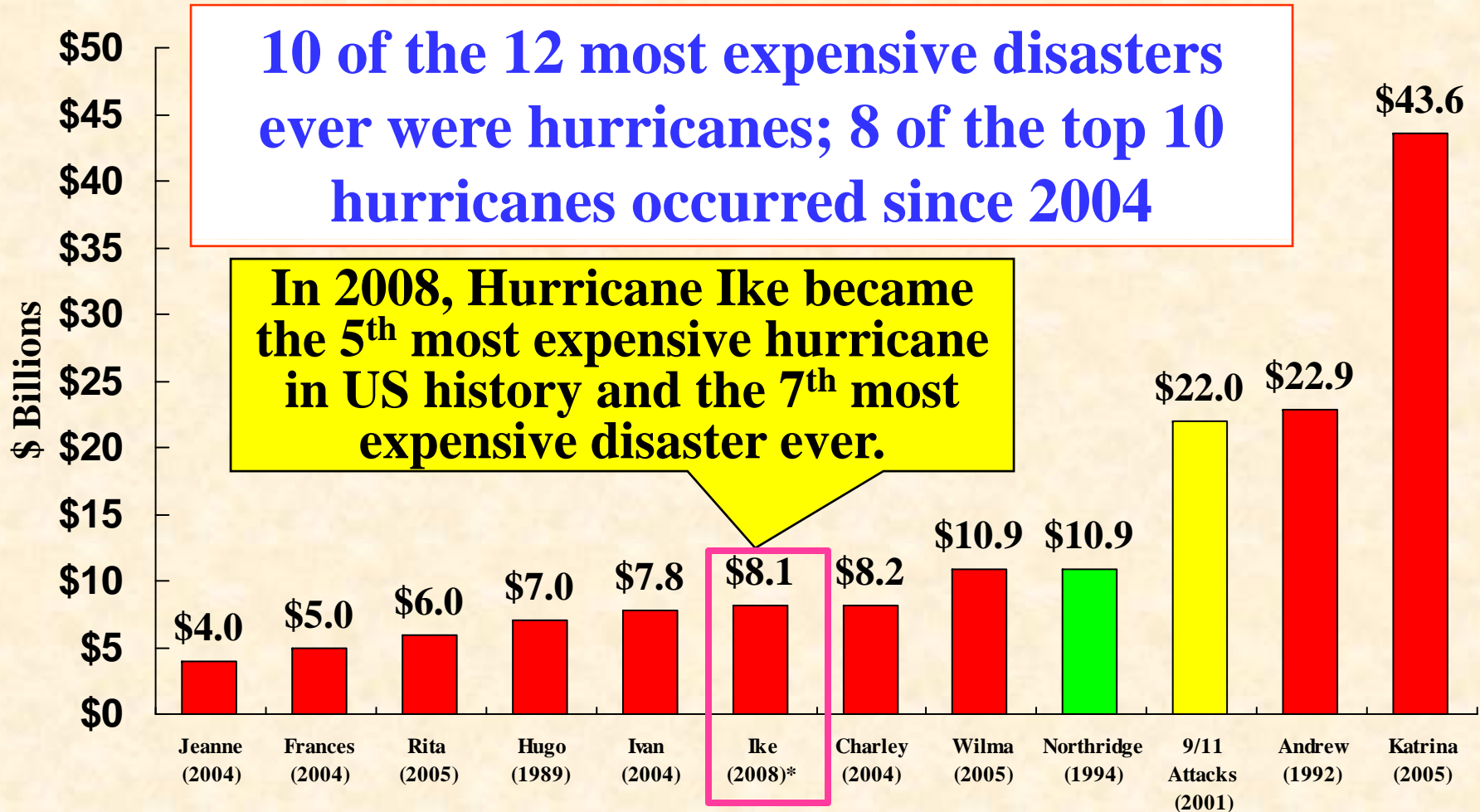
\*\*Based on preliminary PCS data through June 30. PCS \$1.8B loss of for Gustav. \$9.8B for Ike of 9/22.

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

Source: Property Claims Service/ISO; Insurance Information Institute



# Top 12 Most Costly Disasters in US History, (Insured Losses, \$2007)



\*2008 dollars

Sources: ISO/PCS; AIR Worldwide, RMS, Eqecat; Insurance Information Institute inflation adjustments.

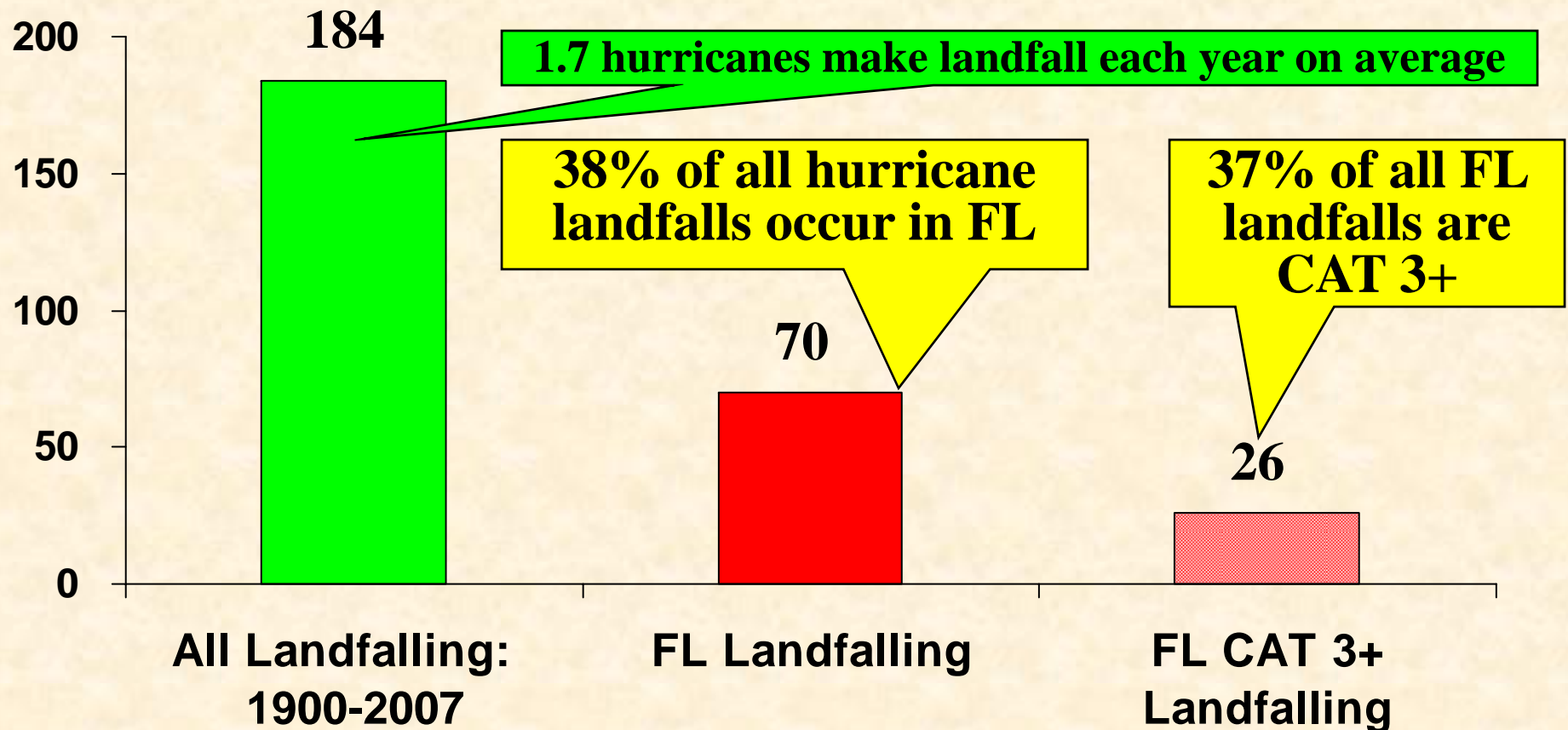




# Landfalling Hurricanes: 1900-2007

## FL Landfalls are Common

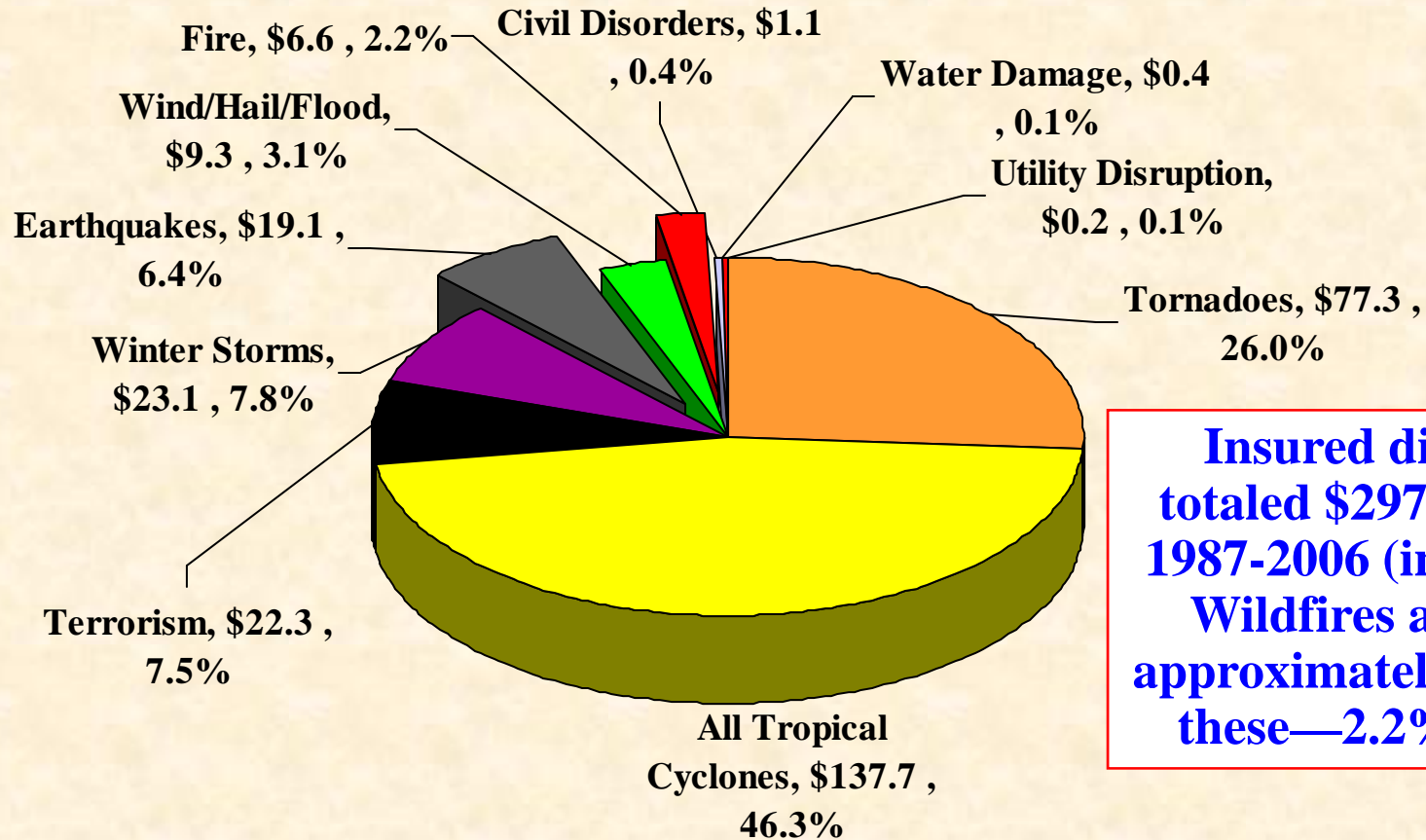
**A hurricane strikes FL every other year on average—CAT 3+ every 4 years**



Source: HURDAT database; Insurance Information Institute.



# Inflation-Adjusted U.S. Insured Catastrophe Losses By Cause of Loss, 1987-2006<sup>1</sup>



**Insured disaster losses totaled \$297.3 billion from 1987-2006 (in 2006 dollars). Wildfires accounted for approximately \$6.6 billion of these—2.2% of the total.**

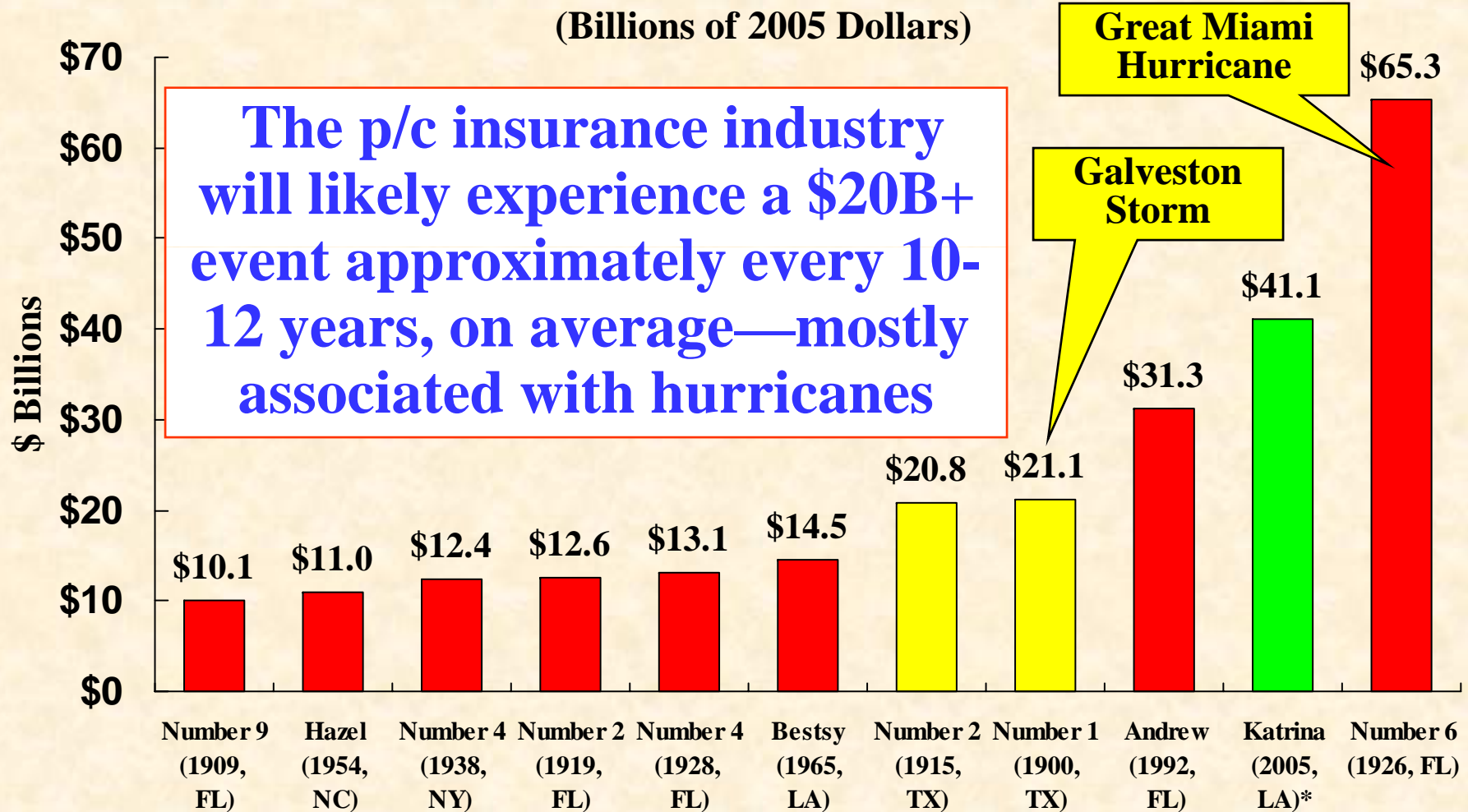
<sup>1</sup> Catastrophes are all events causing direct insured losses to property of \$25 million or more in 2006 dollars.

Catastrophe threshold changed from \$5 million to \$25 million beginning in 1997. Adjusted for inflation by the III.

<sup>2</sup> Excludes snow. <sup>3</sup> Includes hurricanes and tropical storms. <sup>4</sup> Includes other geologic events such as volcanic eruptions and other earth movement. <sup>5</sup> Does not include flood damage covered by the federally administered National Flood Insurance Program. <sup>6</sup> Includes wildland fires.



# Insured Losses from Top 10 Hurricanes Since 1900 & Katrina Adjusted for Inflation, Growth in Coastal Properties, Real Growth in Property Values & Increased Property Insurance Coverage

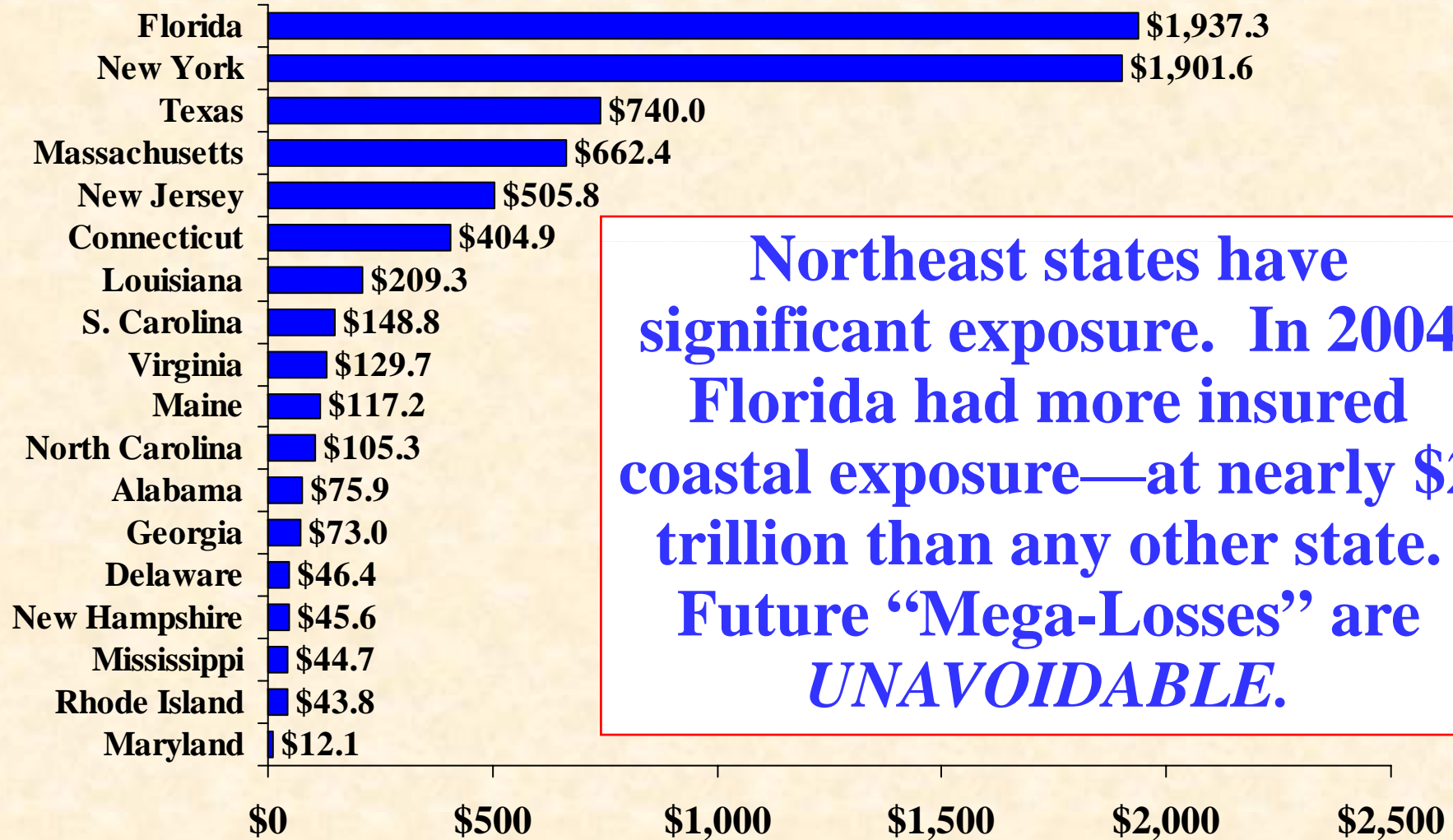


\*ISO/PCS estimate as of June 8, 2006.

Source: Hurricane Katrina: Analysis of the Impact on the Insurance Industry, Tillinghast, October 2005; Insurance Info. Institute.



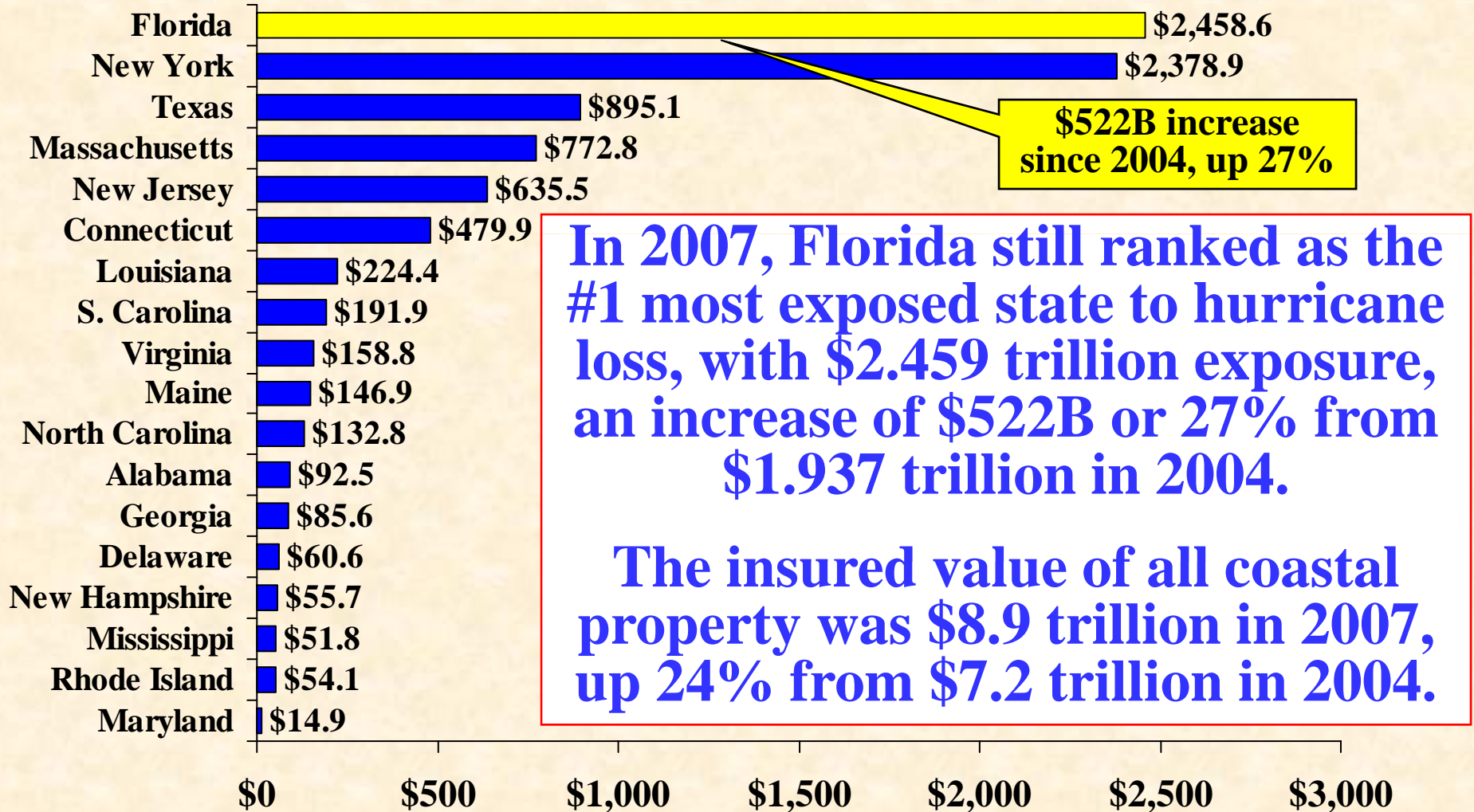
# Total Value of Insured Coastal Exposure (2004, \$ Billions)



Source: AIR Worldwide

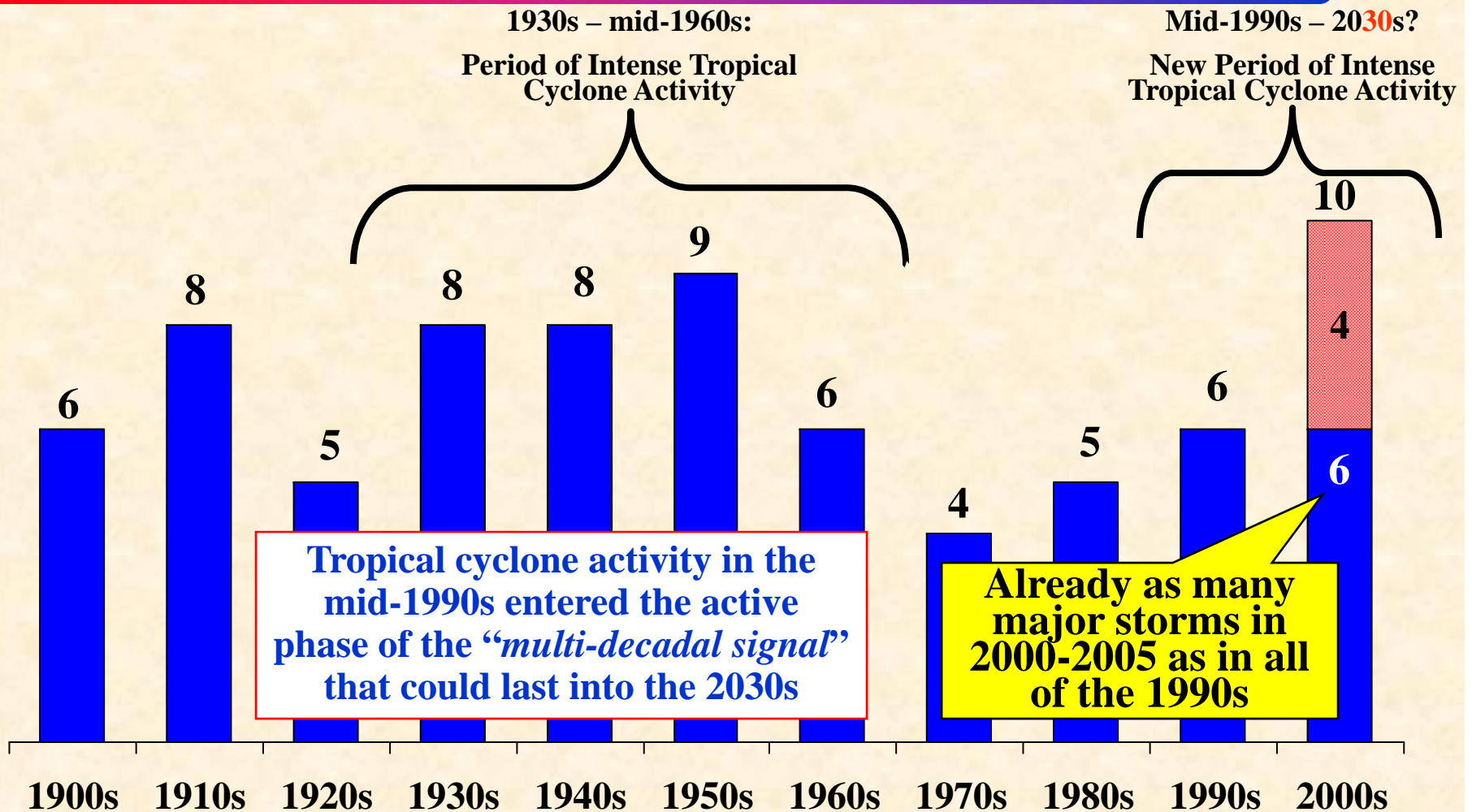


# Total Value of Insured Coastal Exposure (2007, \$ Billions)





# Number of Major (Category 3, 4, 5) Hurricanes Striking the US by Decade




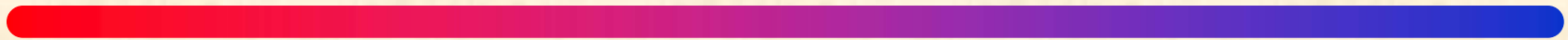
\*Figure for 2000s is extrapolated based on data for 2000-2005 (6 major storms: Charley, Ivan, Jeanne (2004) & Katrina, Rita, Wilma (2005)).

Source: Tillinghast from National Hurricane Center: <http://www.nhc.noaa.gov/pastint.shtm>.

# *Florida & Texas*

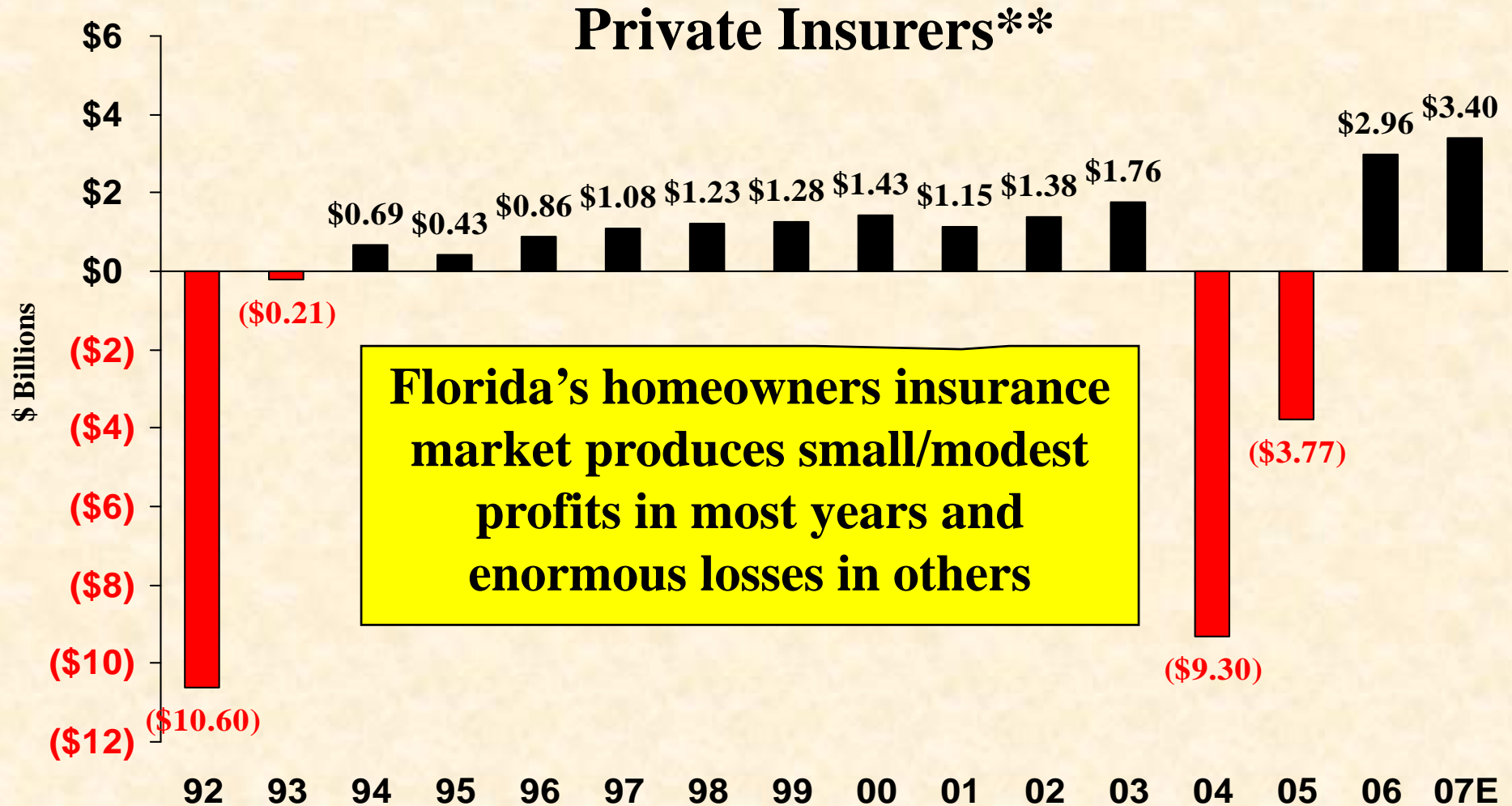
*Facing Economic Reality is*

 *Part of Sustainability*





# Underwriting Gain (Loss) in Florida Homeowners Insurance, 1992-2007E\*



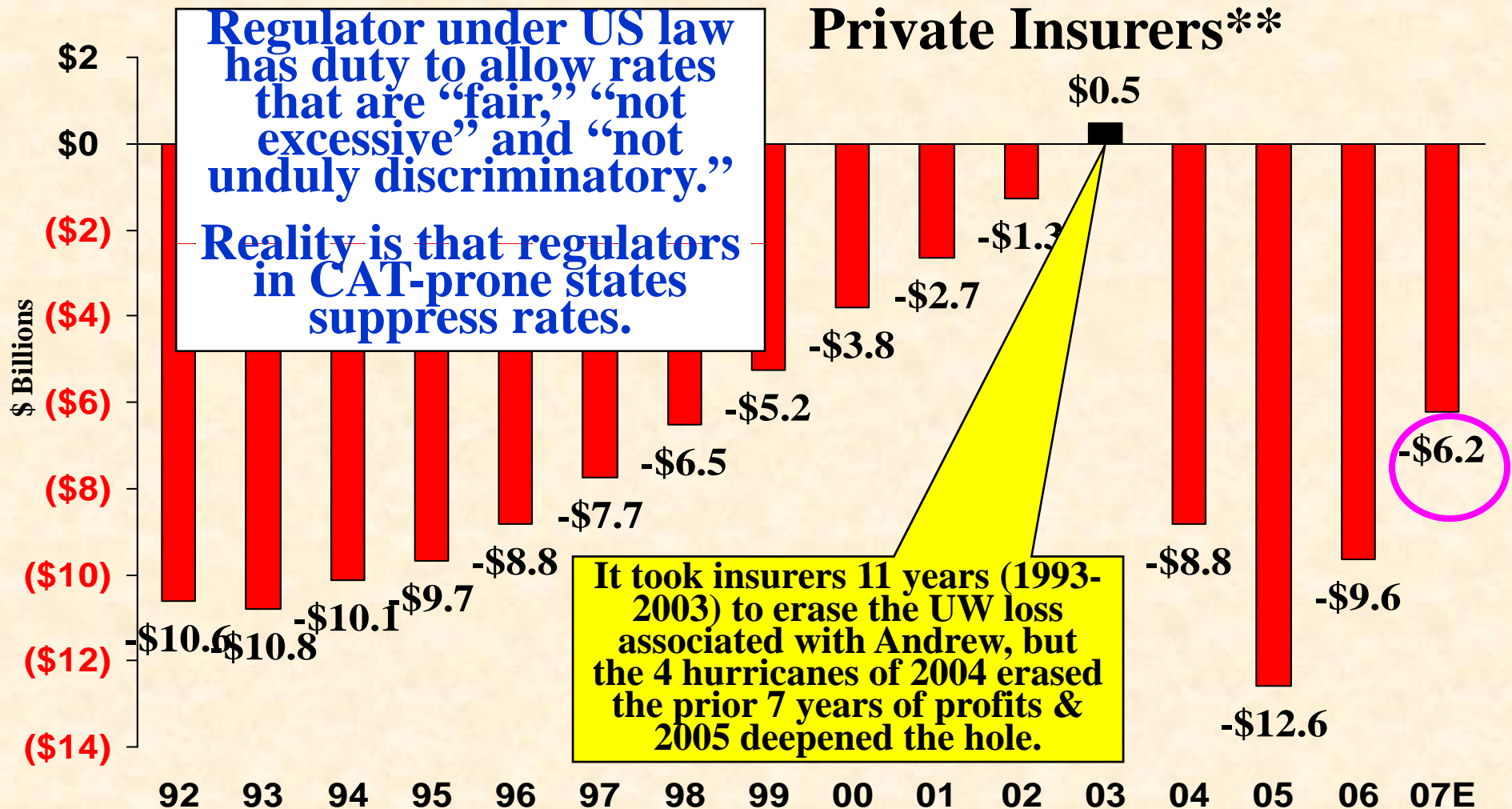
\*2007 estimate by Insurance Information Inst. based on historical loss, expense and premium data for FL.

\*\*Does not include Citizens Property Insurance Corporation results.





# Cumulative Underwriting Gain (Loss) in Florida Homeowners Insurance, 1992-2007E\*



\*2007 estimate by Insurance Information Inst. based on historical loss, expense and premium data for FL.

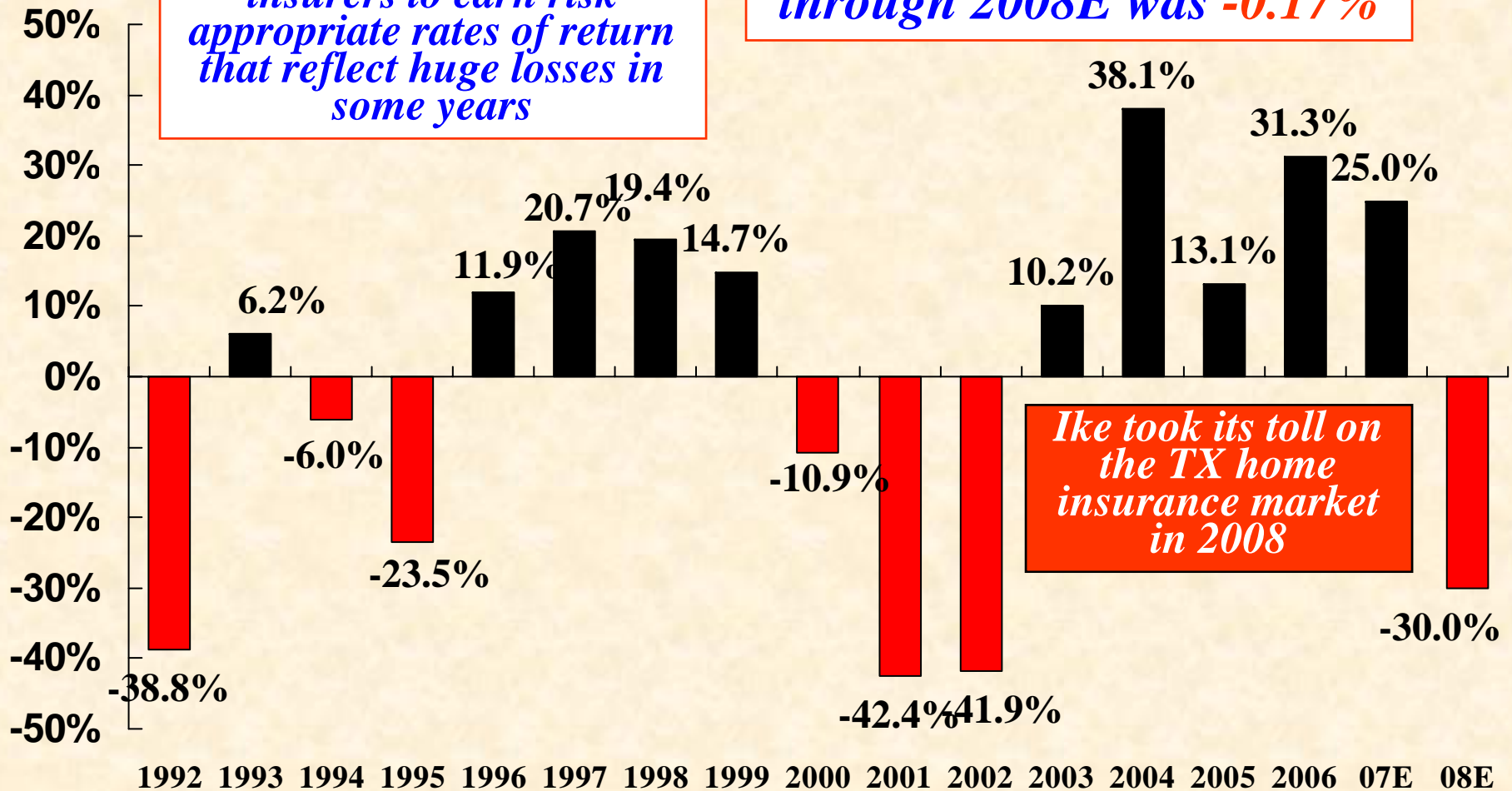
\*\*Does not include Citizens Property Insurance Corporation results.



# ROE for Homeowners Insurance in Texas, 1992 – 2008E

*Texas will need to allow insurers to earn risk appropriate rates of return that reflect huge losses in some years*

*Average ROE in TX 1992 through 2008E was **-0.17%***

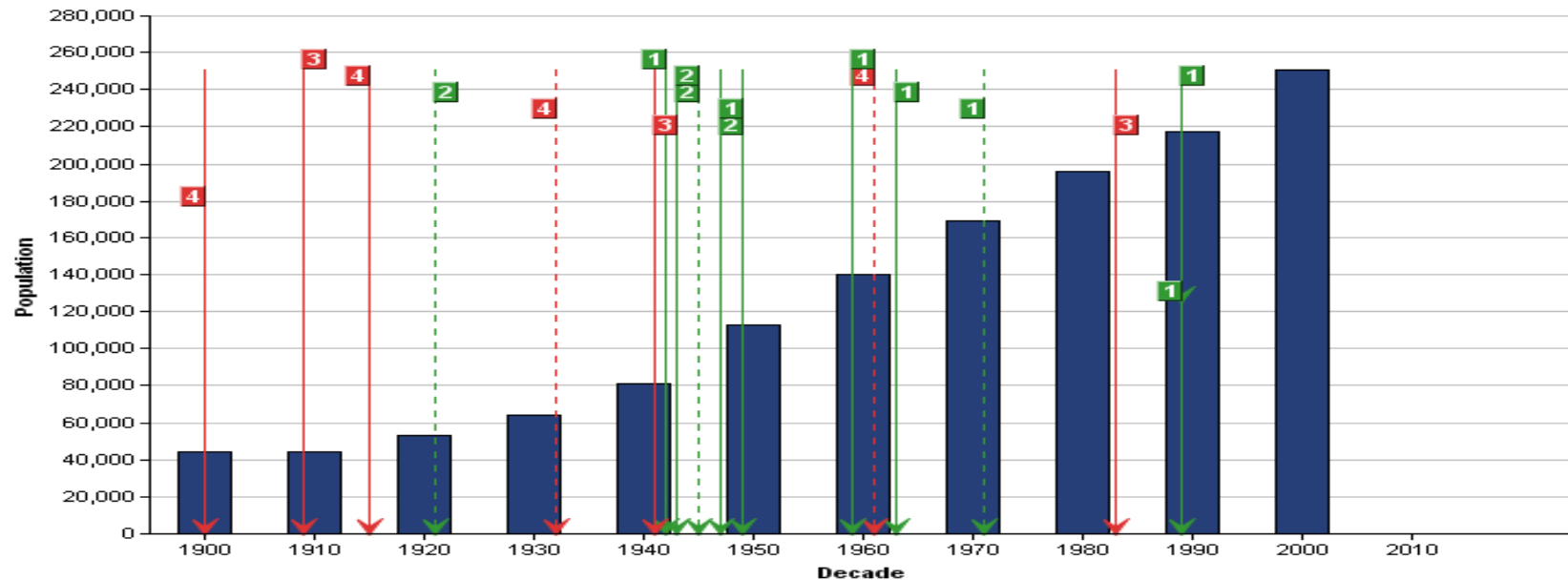


*Ike took its toll on the TX home insurance market in 2008*



# Historical Hurricane Strikes in Galveston County, TX, 1900-2007

## Hurricane Strikes vs Population for Galveston, Texas



**Legend**

Hurricane Category 1-2	Direct Strike
Hurricane Category 3-5	Indirect Strike
Storm moving faster than 30 m.p.h.	Conventional Landfall Storm (Moving from water to land)
	Exiting or Inland Storm (Moving from land to water)

Hurricane Strike Data: National Hurricane Center

Population Data: U.S. Census Bureau

NOTE: Population values may be missing in some counties, particularly for earlier periods. This is most often attributable to the fact that the county had not yet been established.

NOTE: There may be discrepancies between the strike data shown in this chart and the HURDAT strike data used in the Historical Hurricanes Tracks Tool.

The National Hurricane Center is currently updating the strike data used for these charts.

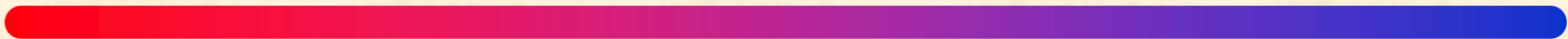
For more information visit [http://www.aoml.noaa.gov/hrd/data\\_sub/re\\_anal.html](http://www.aoml.noaa.gov/hrd/data_sub/re_anal.html)

NOTE: Population data is current as of 2000 U.S. Census. X-axis on graphs depict years through 2010 to illustrate storms that have occurred from 2000-2006.

Source: NOAA Coastal Services Center, <http://maps.csc.noaa.gov/hurricanes/pop.jsp/>; Insurance Info. Institute.

# ***CAPITAL & CAPACITY CONSIDERATIONS:***

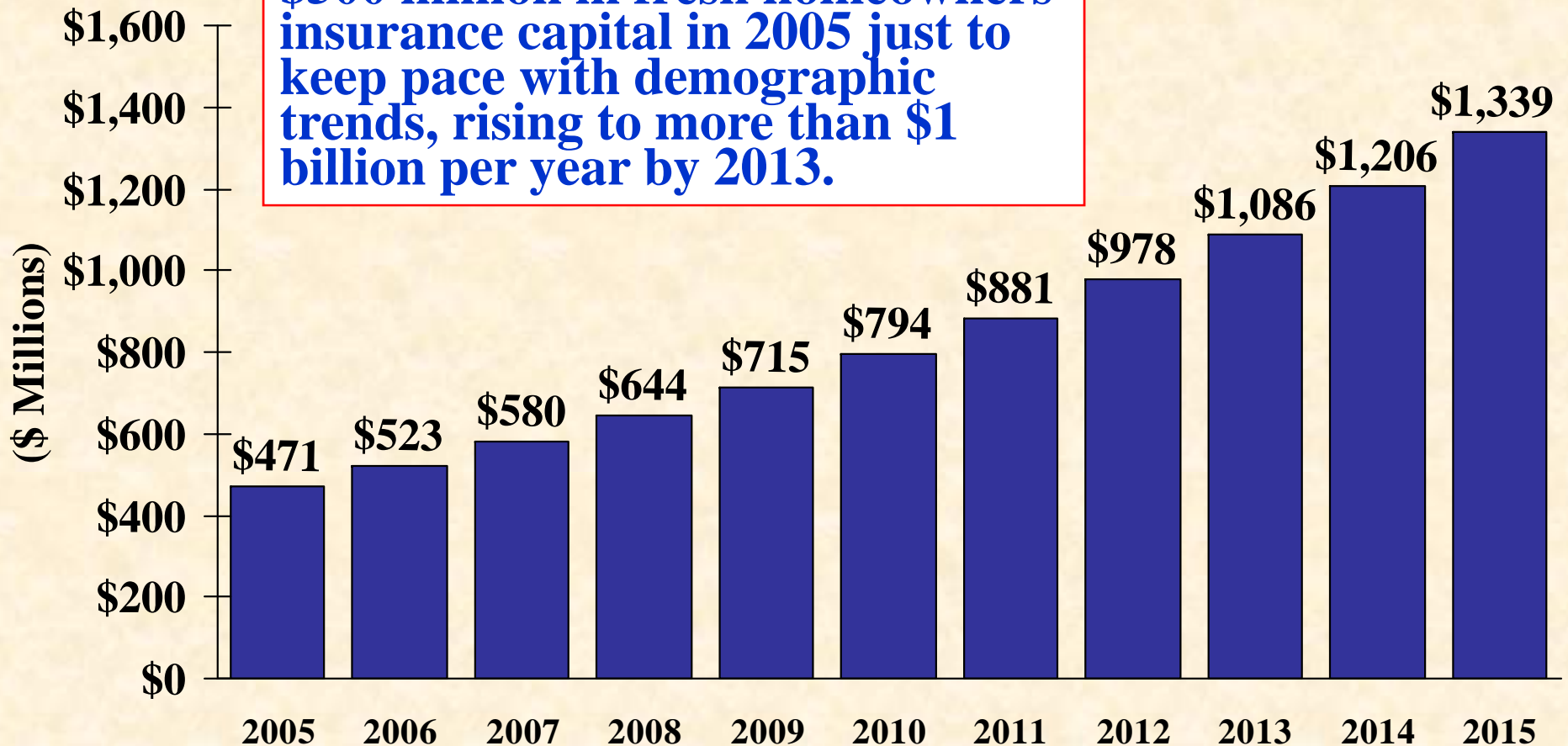
**INSURERS MUST PUT LARGE  
AMOUNTS OF CAPITAL AT  
RISK TO OFFER INSURANCE  
IN FLORIDA**





# *Estimated New Insurance Capital Required to Support Growth in FL Homeownership, 2005-2015\**

**Florida needs to attract about \$500 million in fresh homeowners insurance capital in 2005 just to keep pace with demographic trends, rising to more than \$1 billion per year by 2013.**

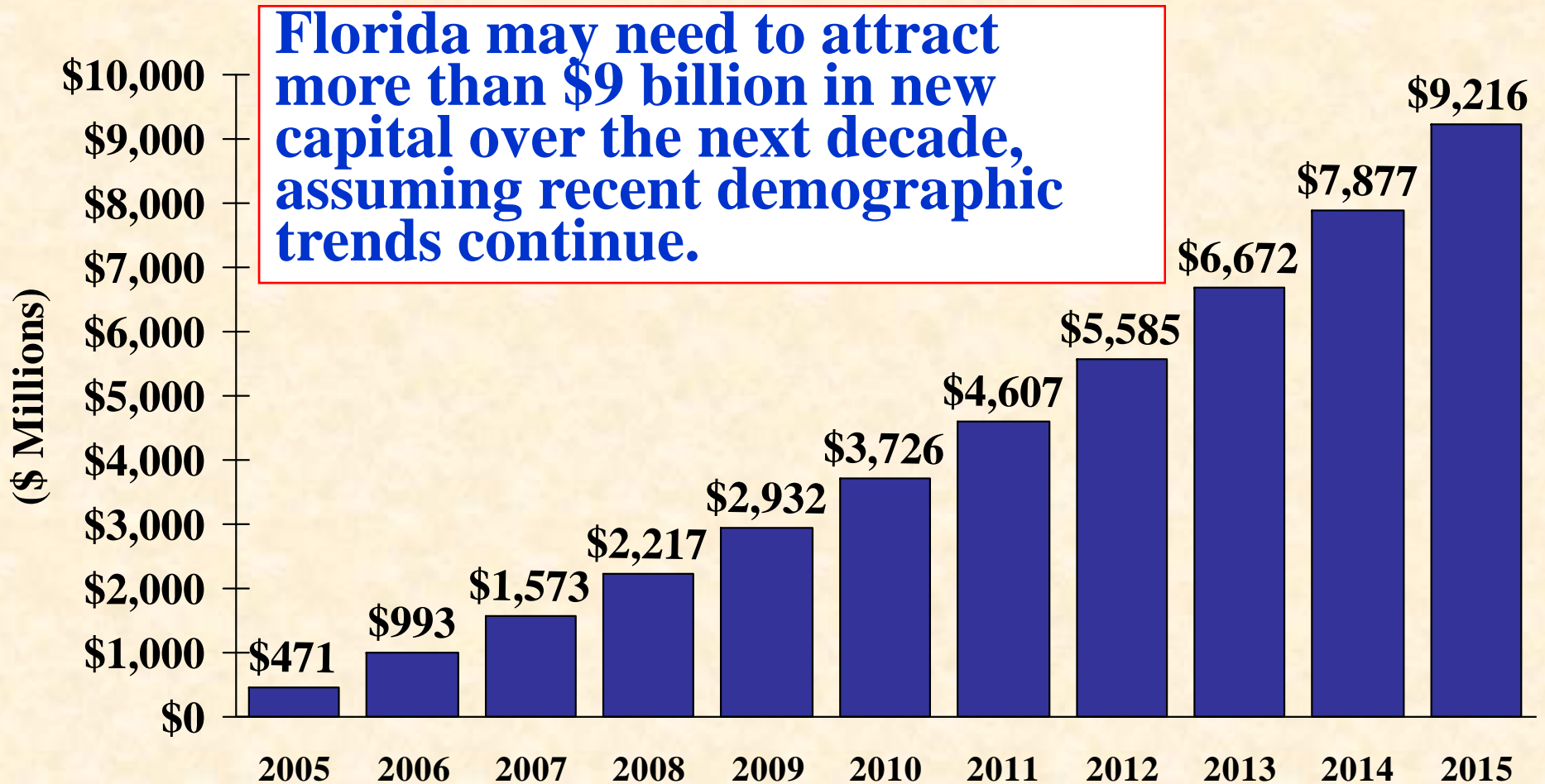


\*Estimate assumes 1:1 premium-to-surplus ratio and continuation of CAGR in direct premiums written of 11% (actual rate for period 1996-2003).

Source: Insurance Information Institute



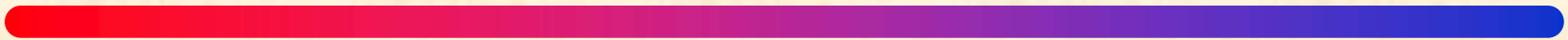
# *Estimated Cumulative New Insurance Capital Required to Support Growth in FL Homeownership, 2005-2015\**



\*Estimate assumes 1:1 premium-to-surplus ratio and continuation of CAGR in direct premiums written of 11% (actual rate for period 1996-2003).

Source: Insurance Information Institute

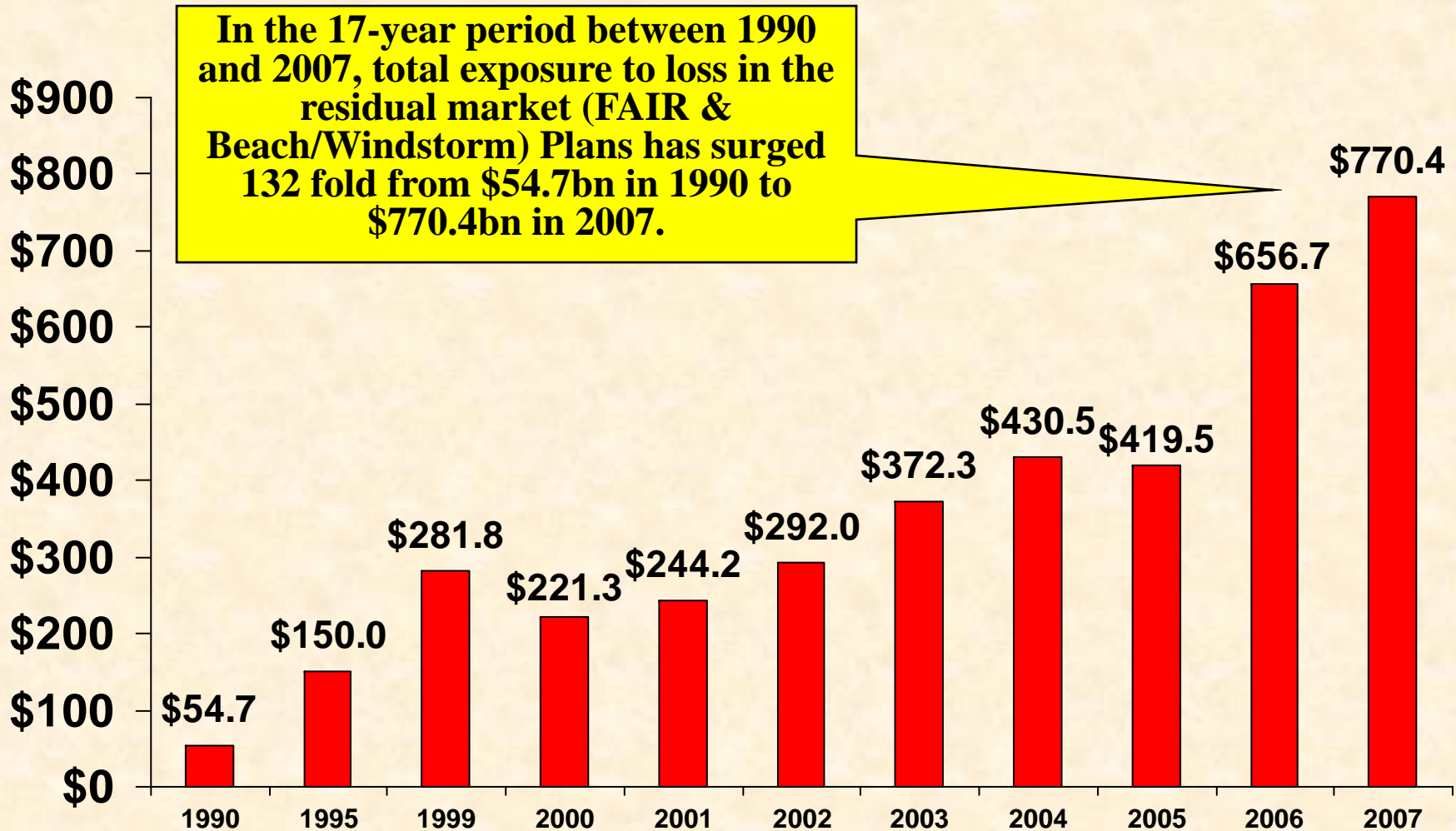
# STATE RESIDUAL MARKETS





# *U.S. Residual Market Exposure to Loss (Billions of Dollars)*

■ Exposure to Loss



Source: PIPSO; Insurance Information Institute

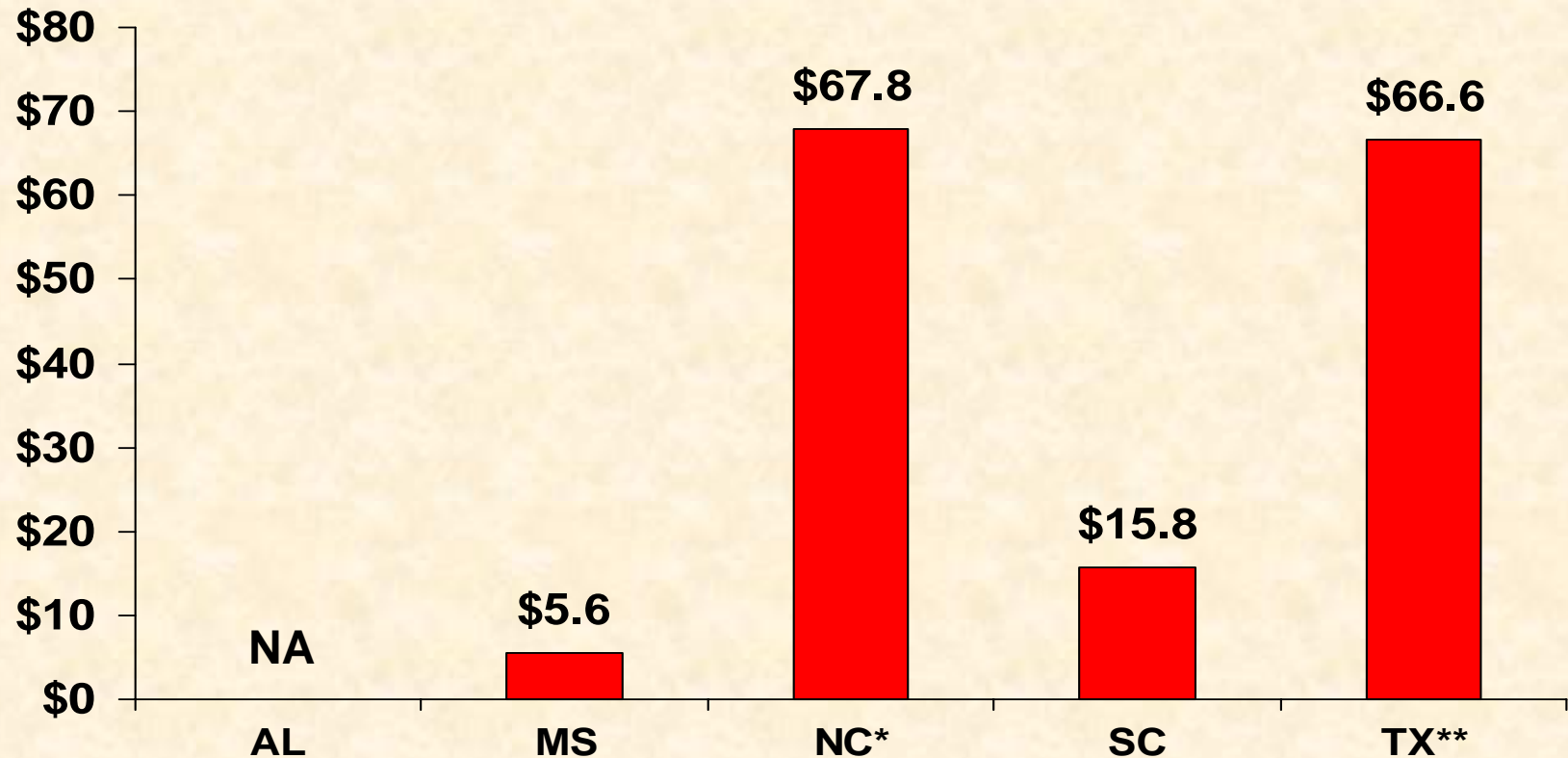




# *Beach and Windstorm Plans*

## *Exposure to Loss (\$ Billion), 2007*

■ Exposure to Loss



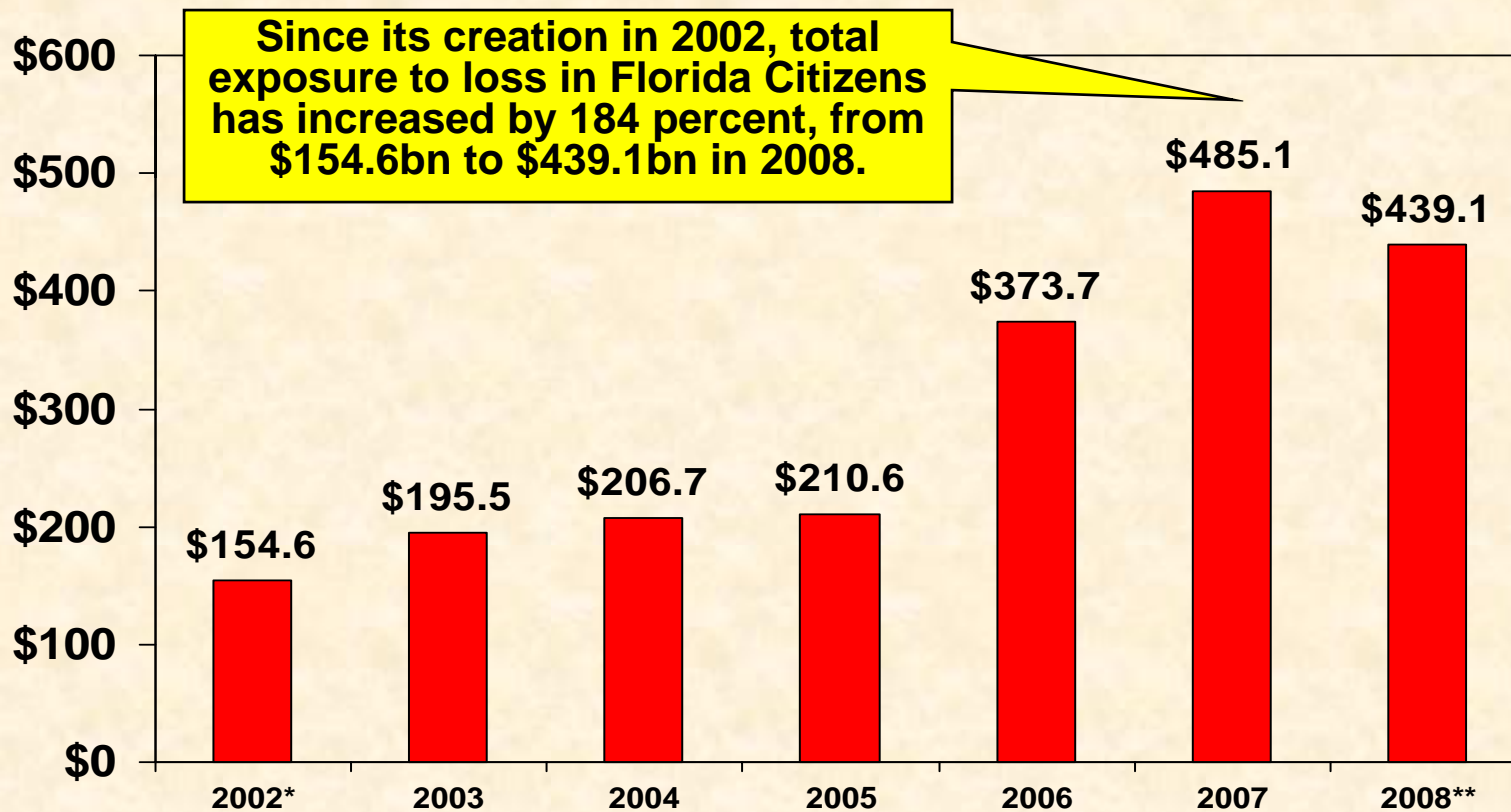
\*As of Mar. 31, 2008 \*\*As of Aug. 31, 2008

Source: PIPSO; NCIUA; TWIA.



# Florida Citizens Annual Exposure to Loss (Billions of Dollars)

■ Exposure to Loss



\*PIPSO Data. \*\*Florida Citizens as of July 2008.

Source: PIPSO; Florida Citizens; Zurich American Insurance Co; Insurance Information Institute



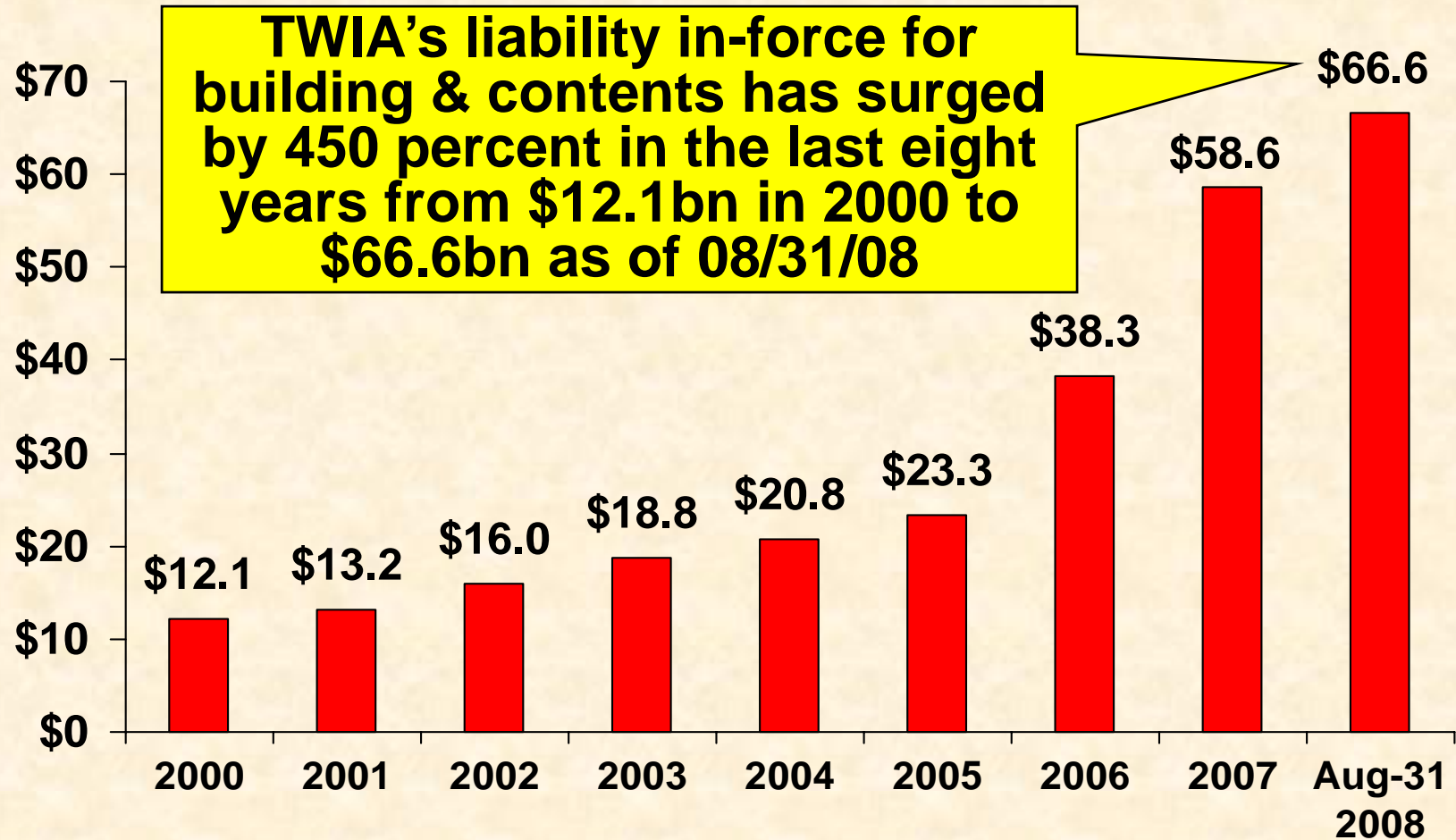
# *FHCF: Capacity Shortfall, But Strong Liquidity*

- FHCF total reimbursement capacity est. at **\$13.3 billion** for 12mth period and **\$11.8 billion** if bonding limited to 6mth period
- Ests. reflect a shortfall from FHCF's theoretical capacity of **\$10 billion** to **\$15 billion**
- Shortfall in FHCF capacity estimate is the result of:
  - Current conditions in the financial markets due to liquidity crisis
  - Increases in interest rates
  - Slight reduction in FHCF's assessment base
  - Expenses paid out of the fund for \$4 billion put option agreement with Berkshire Hathaway
  - Investment losses
- But – the FHCF has a strong liquidity position:
  - **\$2.8 billion** in year-end cash for payment of claims
  - Plus **\$3.5 billion** in five-year floating rate notes totaling **\$6.5 billion**
  - Additional **\$4 billion** from Berkshire Hathaway put option



# *TWIA Growth In Exposure to Loss* *(Building & Contents Only, \$ Billions)*

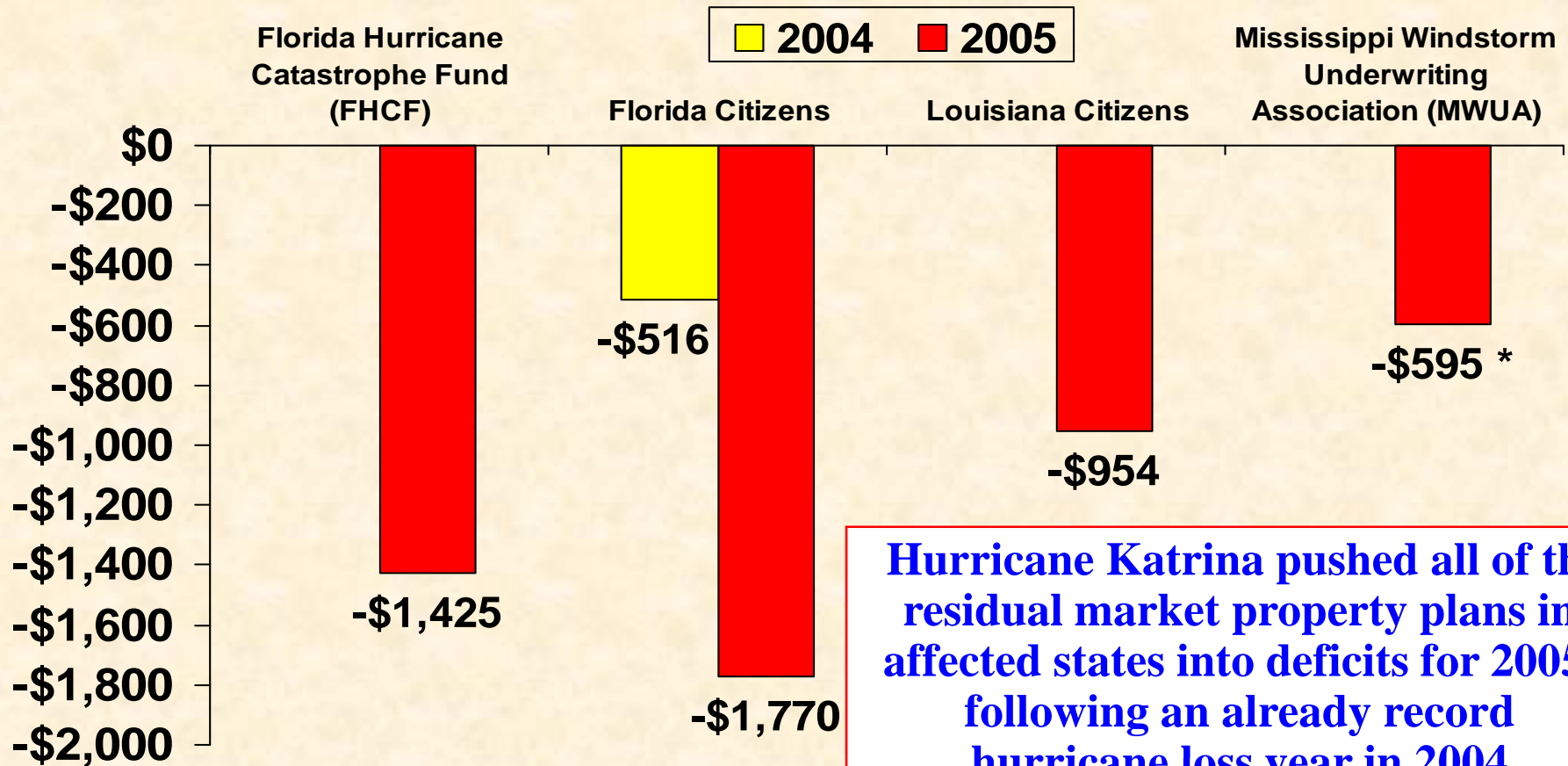
■ Exposure to Loss (Building & Contents Only)



Source: TWIA; Insurance Information Institute;



# Major Residual Market Plan Estimated Deficits 2004/2005 (Millions of Dollars)



**Hurricane Katrina pushed all of the residual market property plans in affected states into deficits for 2005, following an already record hurricane loss year in 2004**

\* MWUA est. deficit for 2005 comprises \$545m in assessments plus \$50m in Federal Aid.

Source: Insurance Information Institute



# *Natural Catastrophe Plans (1)*

- **Homeowners' Defense Act of 2007 (H.R. 3355) (Co-authors Rep. Tim Mahoney (D-FL) and Rep. Ron Klein (D-FL)):**
  - **Would create a national catastrophe fund**
  - **Allow states to pool catastrophe risk and transfer risk to private market via cat bonds or reinsurance**
  - **Also create a federal loan program to provide funds to state reinsurance plans both prior and after a disaster**
  - **Bill passed House Nov. 2007, but is currently stalled in the Senate (S. 2310)**
- **Allstate -- ProtectingAmerica.org:**
  - **Created in 2005 by coalition of emergency management officials, first responders, disaster relief experts, insurers and others**
  - **Propose establishing a national catastrophe fund to serve as financial backstop for state catastrophe funds**
  - **Backs H.R. 3355**



## *Natural Catastrophe Plans (2)*

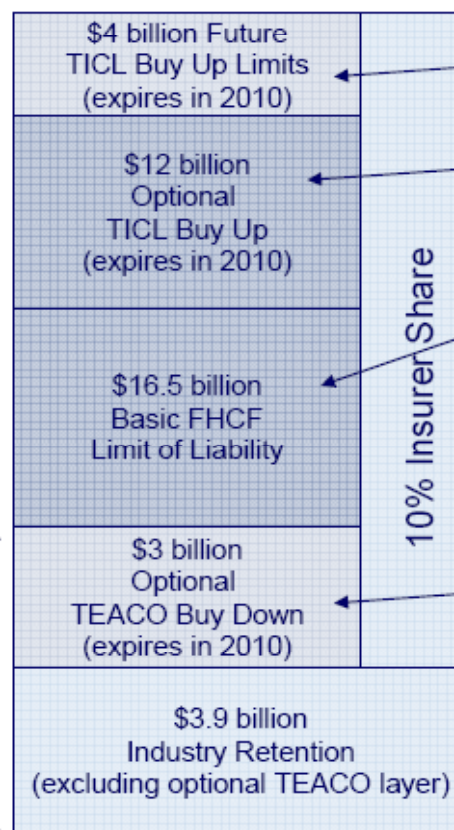
- **The Hartford – Coastal Catastrophe Partnership:**
  - Seek to put risk back on private insurers
  - Mandate flood insurance for all coastal homeowners
  - Create a Federal and state-level reinsurance funds to backstop losses by private insurers
  - Establish untaxed savings accounts (“supplemental catastrophic security accounts”) to pay for property insurance
- **The Travelers, Nationwide and broker groups:**
  - Create Federally regulated “Coastal Hurricane Zone” from Texas to Maine.
  - Fed. Govt would not have a financial role, but would oversee wind underwriting by private insurers, including pricing
  - Federal reinsurance sold at cost for extreme events such as \$100 billion+ hurricane
  - Risk-based, actuarially sound rates using approved standards and wind risk models
  - Incentives for state and local governments to adopt federal guidelines for appropriate building codes and land use planning.

# Florida Hurricane Catastrophe Fund

Assets: \$3.4 billion  
 Annual Premium: \$1.3 billion  
 Annual Exposure: \$28.5 billion  
 Multi-Year Exposure: \$50.0 billion

**FHCF estimates that there is a 1.7% chance in 2008 that it would need to levy a \$1,902,000,000 assessment on all Florida homeowners, auto owners and businesses for each of the next 30 years**

FHCF requires insurers to retain a share of \$6.9 billion for the first two events in a year. The retention for additional events during the year are reduced to 1/3.



1:70 probability  
 FHCF has the authority to offer this additional coverage but has not done so

1:60 probability (1.7%)  
 Annual premium ~242 million from 134 insurers at about \$.02-\$.03 per \$1 of coverage

1:30 probability (3.3%)  
 Annual premium ~1.09 billion from 207 insurers

1:7 probability  
 No company has purchased TEACO Buy Down coverage which is offered at market rates

Top FHCF mandatory coverage recipients

Florida Citizens	40.4%
State Farm	11.2%
Allstate	3.5%
QBE	2.4%
USAA	2.4%
Chubb	2.4%
Nationwide	2.2%

Source: Preliminary Official Statement Series 2008 A Bonds (7/9/08)



# Florida Hurricane Catastrophe Fund

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## **Loss History:**

1995	\$13 million
2004	\$5.2 billion
2005	\$3.95 billion (\$1.975 billion financed through long term debt)

**Total Premium Collected:** \$8.6 billion (1995-2008)

**Berkshire Put:** FHCF has entered into an agreement by which Berkshire would agree to purchase up to \$4 billion of FHCF post-event debt at pre-negotiated terms in exchange for a \$224 million premium payment

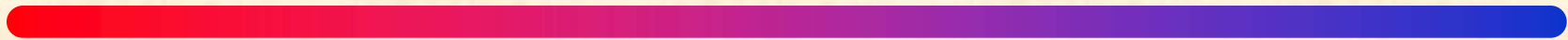
## **Reported Investment Impairment:**

\$141 million in illiquid commercial paper  
\$110.35 million in securities downgraded since purchase

Source: Preliminary Official Statement Series 2008 A Bonds (7/9/08) and 2007 Annual Statement

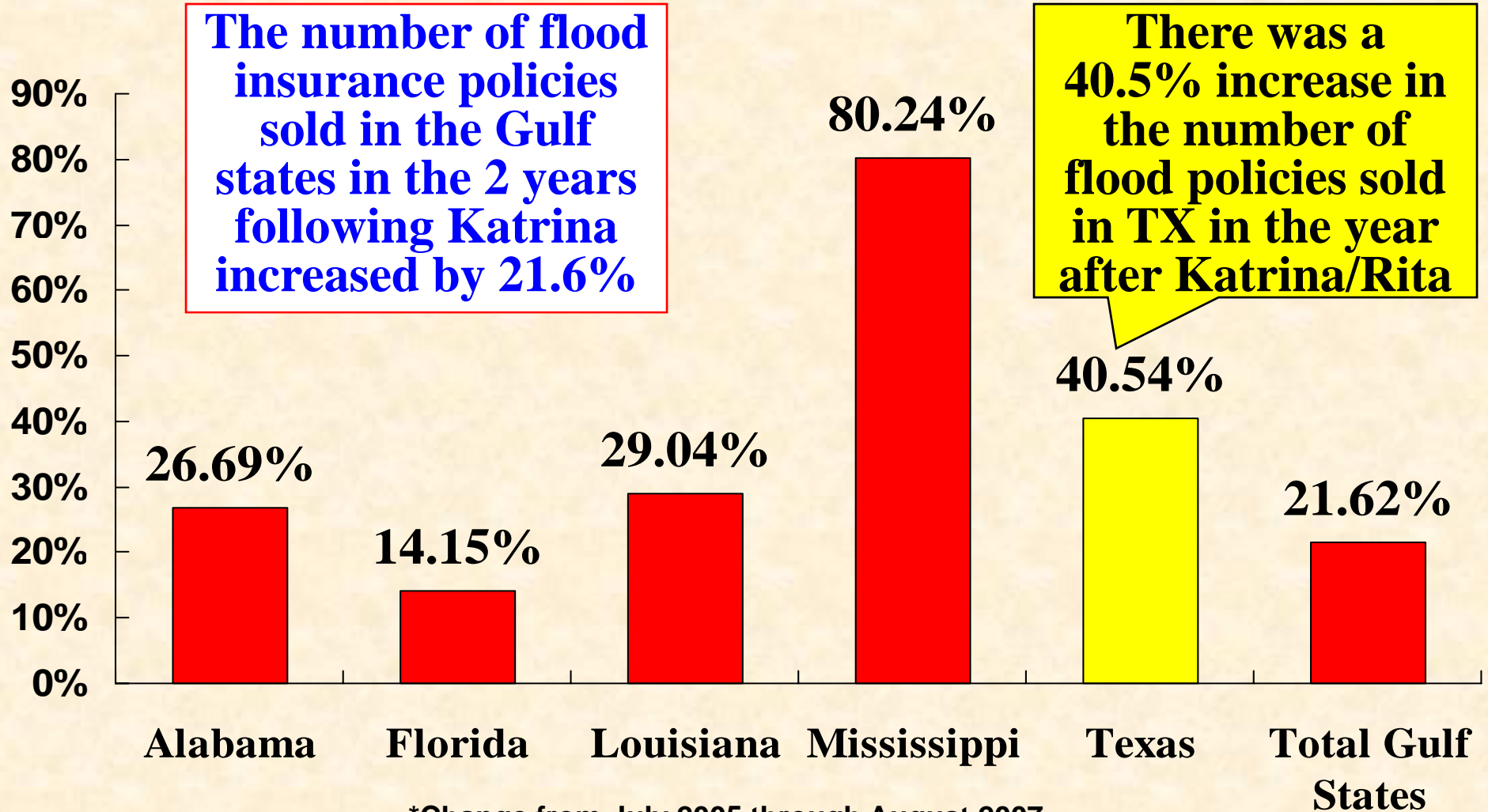
# **Flood Insurance**

## **Analysis of Flood Policy Purchase and Lapse Rates Since Katrina in Texas**





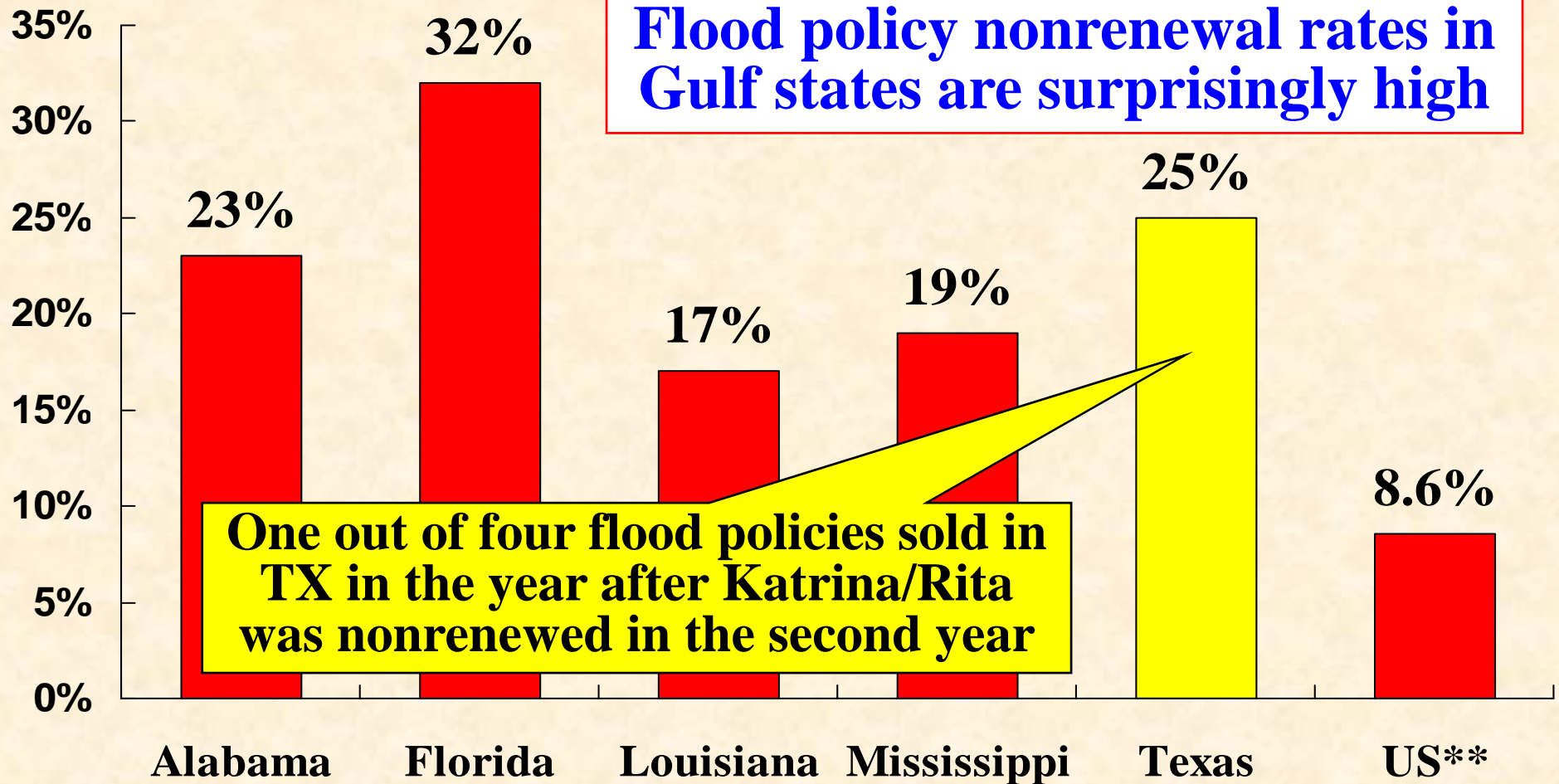
# NFIP Flood Policy Growth in Gulf States Since Katrina\*



\*Change from July 2005 through August 2007.  
Sources: NFIP ; Insurance Information Institute.



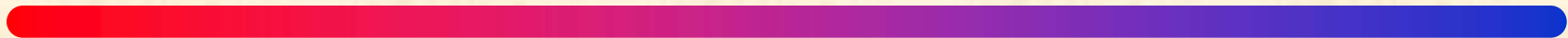
# Percentage of NFIP Flood Policies Issued Since Katrina That Are Not Renewed\*



\*Policies issued since July 2005 as of August 2007. \*\*US figure is nonrenewal rate for all policies in force, average over 12 month period ending August 2007.

Sources: NFIP ; Insurance Information Institute.

# **Are Coastal Development Patterns Economically Rational?**





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# *New Condo Construction in South Miami Beach, 2007-2009*

- **Number of New Developments: 15**
- **Number of Individual Units: 2,111**
- **Avg. Price of Cheapest Unit: \$940,333**
- **Avg. Price of Most Expensive Unit: \$6,460,000**
- **Range: \$395,000 - \$16,000,000**
- **Overall Average Price per Unit: \$3,700,167\***
- **Aggregate Property Value: At least \$6 Billion**



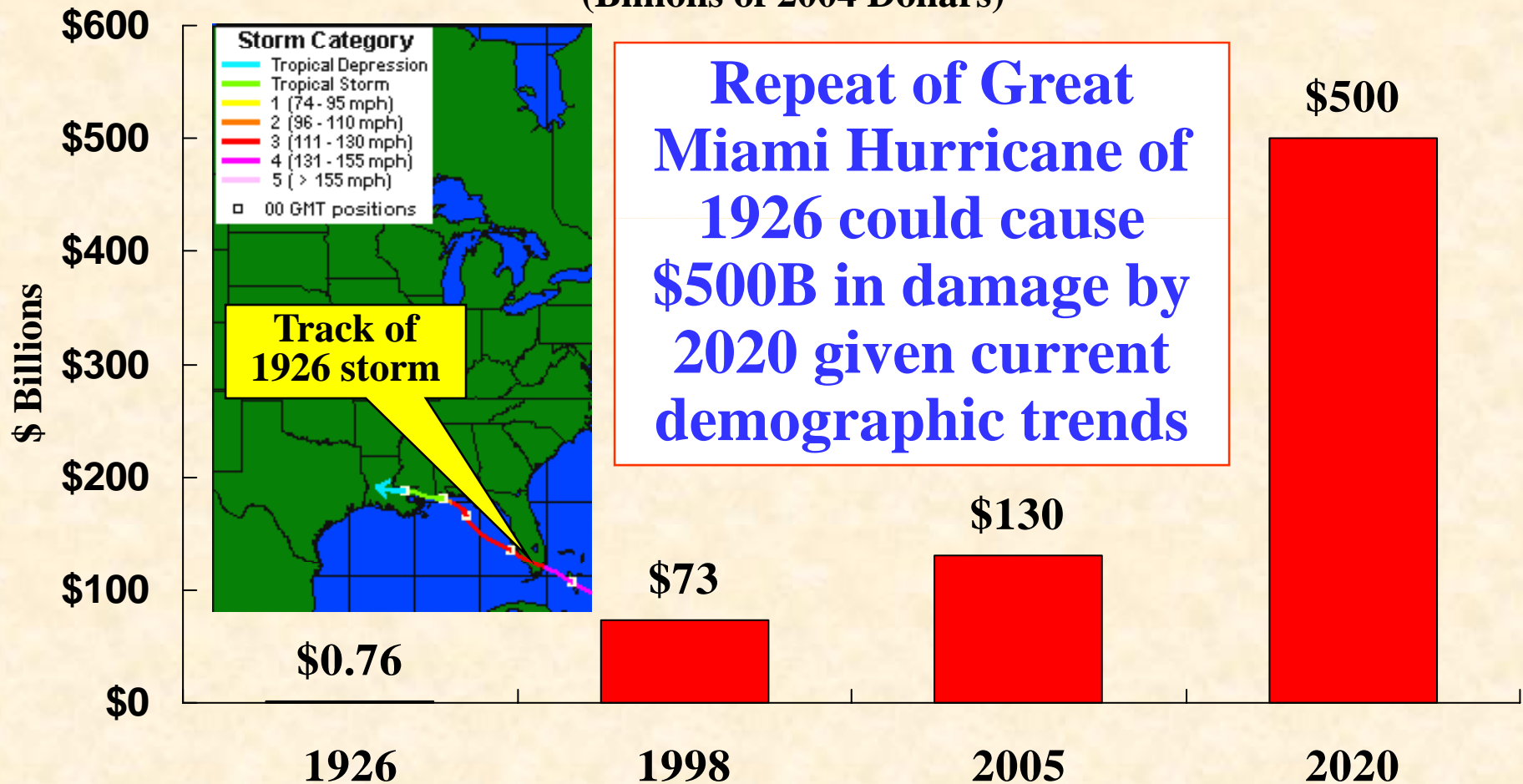
\*Based on average of high/low value for each of the 15 developments

Source: Insurance Information Institute from [www.miamicondolifestyle.com](http://www.miamicondolifestyle.com) accessed April 5, 2007.



# Great Miami Hurricane of 1926: Hurricane Damage Adjusted for Inflation, Growth in Coastal Properties, Real Growth in Property Values\*

(Billions of 2004 Dollars)



\*Includes damage from wind and storm surge but generally excludes inland flooding.  
Source: Roger Pielke and Christopher Landsea, December 2005; Insurance Info. Institute.





# *Excessive Catastrophe Exposure: Outcome of Economically & Politically Rational Decision Process?*

- **Property Owners**

- Make economically rational decision to live in disaster-prone areas
- Low cost of living, low real estate prices & rapid appreciation, low/no income tax, low property tax, rapid job growth
- Government-run insurers (e.g., CPIC, NFIP) provide implicit subsidies by selling insurance at below-market prices with few underwriting restrictions
- Government aid, tax deductions, litigation recovery for uninsured losses
- No fear of death and injury

- **Local Zoning/Permitting Authorities**

- Allowing development is economically & politically rational & fiscally sound
- Residential construction creates jobs, attracts wealth, increases tax receipts, stimulates commercial construction & permanent jobs, develops infrastructure
- Increases local representation in state legislature & political influence
- Property and infrastructure damage costs shifted to others (state and federal taxpayers, policyholders in unaffected areas)

- **Developers**

- Coastal development is a high-margin business
- Financial interest reduced to zero after sale

Source: Insurance Information Institute.



# *Excessive Catastrophe Exposure: Outcome of Economically & Politically Rational Decision Process?*

- **State Legislators**

- Loathe to pass laws negatively impacting development in home districts
- Local development benefits local economy and enhances political influence
- Rapid development lessens need for higher income and property taxes
- Can redistribute CAT losses to unaffected policyholders and taxpayers
- Can suppress insurance prices via state insurance regulator, suppress pricing and weaken underwriting standards in state-run insurer & redistribute losses

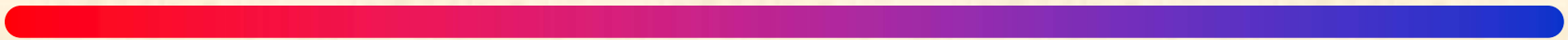
- **Congressional Delegation**

- Home state development increases influence in Washington  
Political representation, share of federal expenditures
- Loathe to pass laws harming development in home state/district
- Tax law promotes homeownership and actually produces supplemental benefits for property owners in disaster-prone areas
- Large amounts of unbudgeted disaster aid easily authorized
- Tax burden largely borne by those outside CAT zone & those with no representation (children & unborn)

- **President**

- Presidential disaster declarations and associated aid are increasing
- Political benefits to making declarations and distributing large amounts of aid
- Direct impact on favorability ratings & election outcomes
- Losses can be distributed to other areas and the unrepresented

# How Insurers Signal *What* Should be Built and *Where*



# *Government-Run Insurers Lead to Poor Land Use/Design Decisions*

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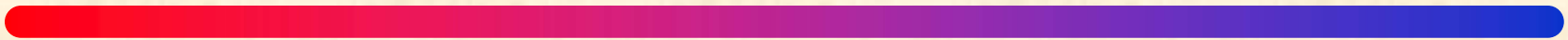
- **Government-run insurers (markets of last resort) serve as a vital safety valve after major market disruptions, but also serve as an enabler of unwise development...**
- **Government-run property insurers wash away market-based signals about relative risk**
- **Consequence is runaway development in disaster-prone areas**
- **Government-run insurers:**
  - Generally fail to charge actuarially sound rates
  - Have weak underwriting standards
  - Are thinly capitalized
  - Can assess losses to policyholders other than their own
  - Vulnerable to political pressure
- **Inadequate premiums, insufficient capital and weak underwriting mean that most government plans, from Citizens Property Insurance Corporation to the National Flood Insurance Program operate with frequent deficits**



# *Negative Outcomes from Flaws in Government-Run Insurers*

- **True risk associated with building on a particular piece of property is obscured**
- **Subsidies are generated leading to market distortions/inequities:**
  - Many thousands of homes likely would not have been built (or built differently) if property owner obligated to pay actuarially sound rates
  - CPIC assessments from Wilma will require grandmothers living in trailer parks on fixed incomes in Gainesville to subsidize million dollar homes in Marco Island via assessment (surcharges).
- **Serial rebuilding in disaster-prone areas is the norm**
- **Property owners come to assume that the government rate is the “fair” rate and object to moves to actuarially sound rates.**
- **Government-run insurer can’t control its own exposure**
  - Legislature mandates that CPIC offer coverage in most cases if no private insurer will offer coverage due to high risk, near certainty of destruction
  - No restrictions on value of property, so high-valued properties represent disproportionate share of potential loss
- **Taxpayer Burden: NFIP borrowed \$20B+ in 2005**

# What Works, What Doesn't





# *Successful Tools for Controlling Hurricane Exposure*

- **Strengthened building codes**
- **Stringent enforcement of building codes**
- **Fortified home programs**
- **Insurance rates based on sound actuarial principles (risk-based rates that are not government controlled); Works for commercial insurers**
- **Disciplined underwriting**
- **Removing impediments to capital flows**
- **Incentives to adopt mitigation**
- **Forcing communities to consider and take a larger stake in their catastrophe exposure**



# *Unsuccessful Tools for Controlling Hurricane Exposure*

- **Insurance rates that are not actuarially sound (i.e., don't reflect true risk)**
- **Political interference in rate process**
- **Inadequate underwriting controls**
- **Subsidies**
  - **Intra-state (policyholders/taxpayers)**
  - **US Taxpayer**
- **Voluntary flood coverage**
- **Litigation**



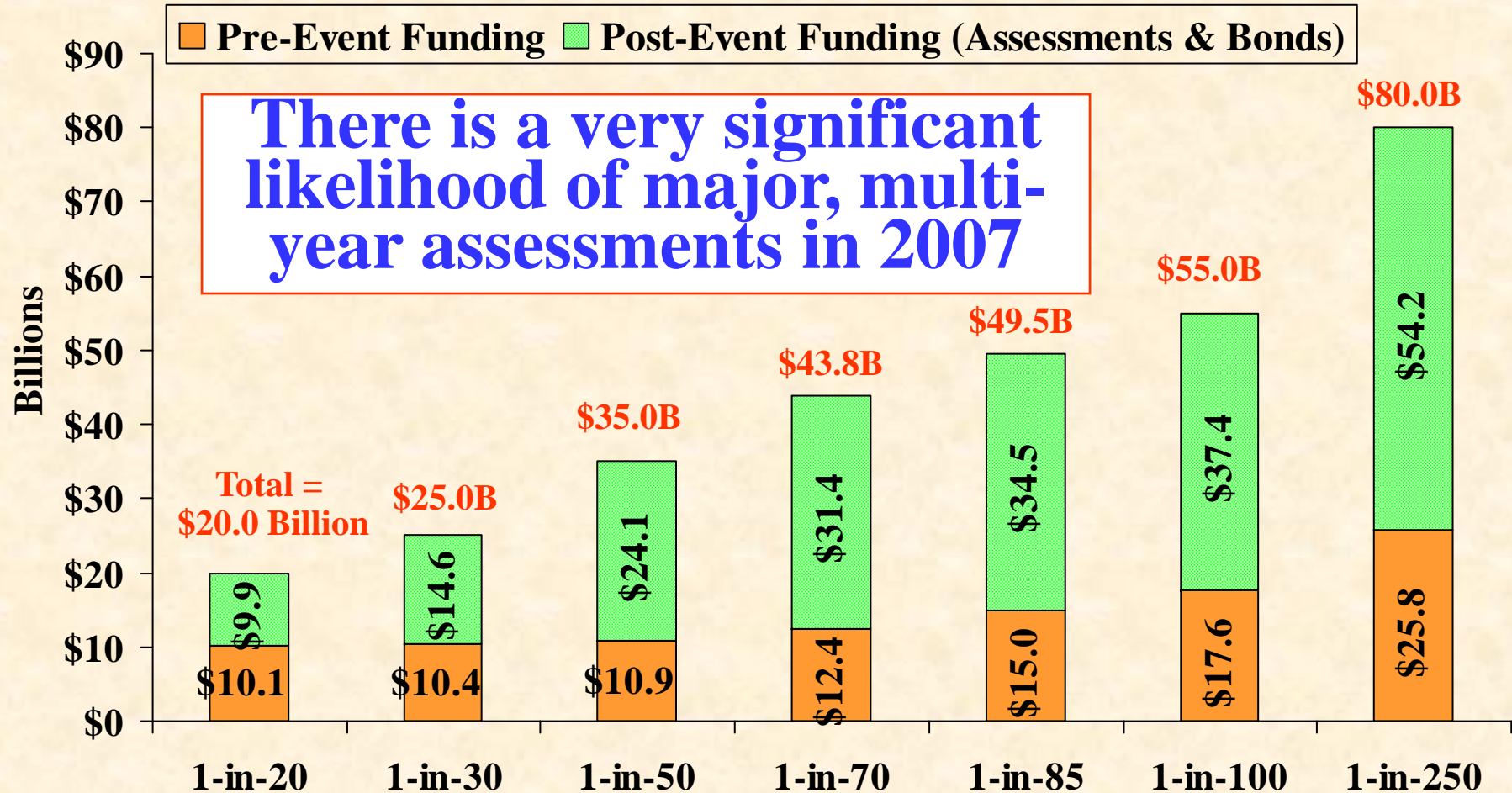


## *Problem Issues*

- **Local control of land use and permitting creates significant incentive problems**
  - **Benefits accrue locally while many costs can be redistributed to others via taxes, insurance and aid**
- **Prospect of government aid reinforces unsound building and location decisions**
- **States don't want to raise taxes to pay for mitigation/prevention even if state is sole beneficiary**
  - **E.g., NO levees; Beach replenishment**



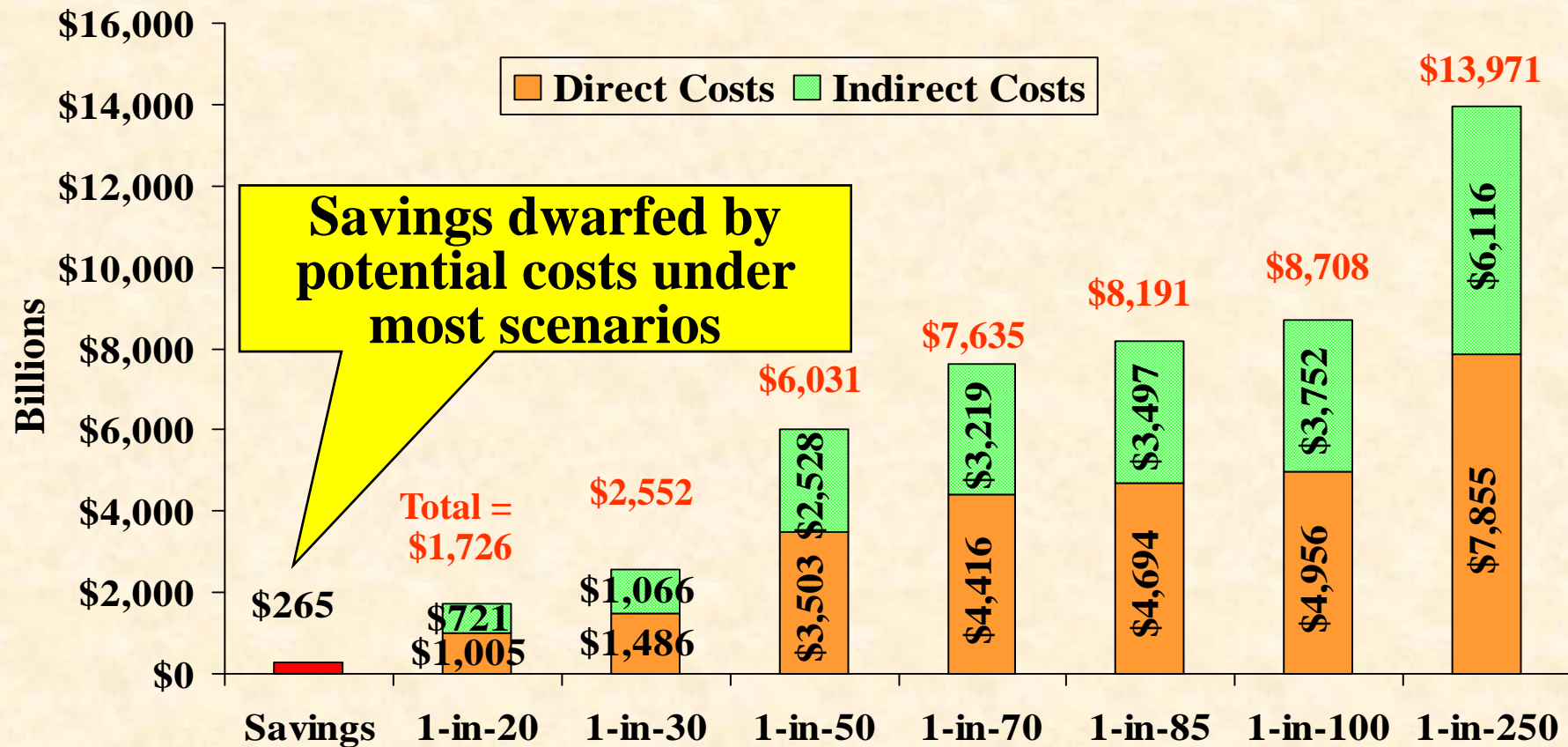
# Pre- vs. Post-Event in FL for 2007 Hurricane Season



Notes: Pre-event funding includes funds available to Citizens, FHCFC and private carriers plus contingent funding available through private reinsurance to pay claims in 2007. Post-event funding is on a present value basis and does not include financing costs. Probabilities are expressed as “odds of a single storm of this magnitude or greater happening in 2007.”  
Source: Tillinghast Towers Perrin, *Study of Recent Legislative Changes to Florida’s Property Insurance Mechanisms*, 3/07.

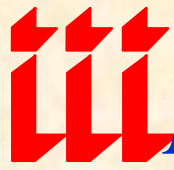


# Per Household Savings vs. Long-Term Costs of FL Legislation for 2007 Hurricane Season



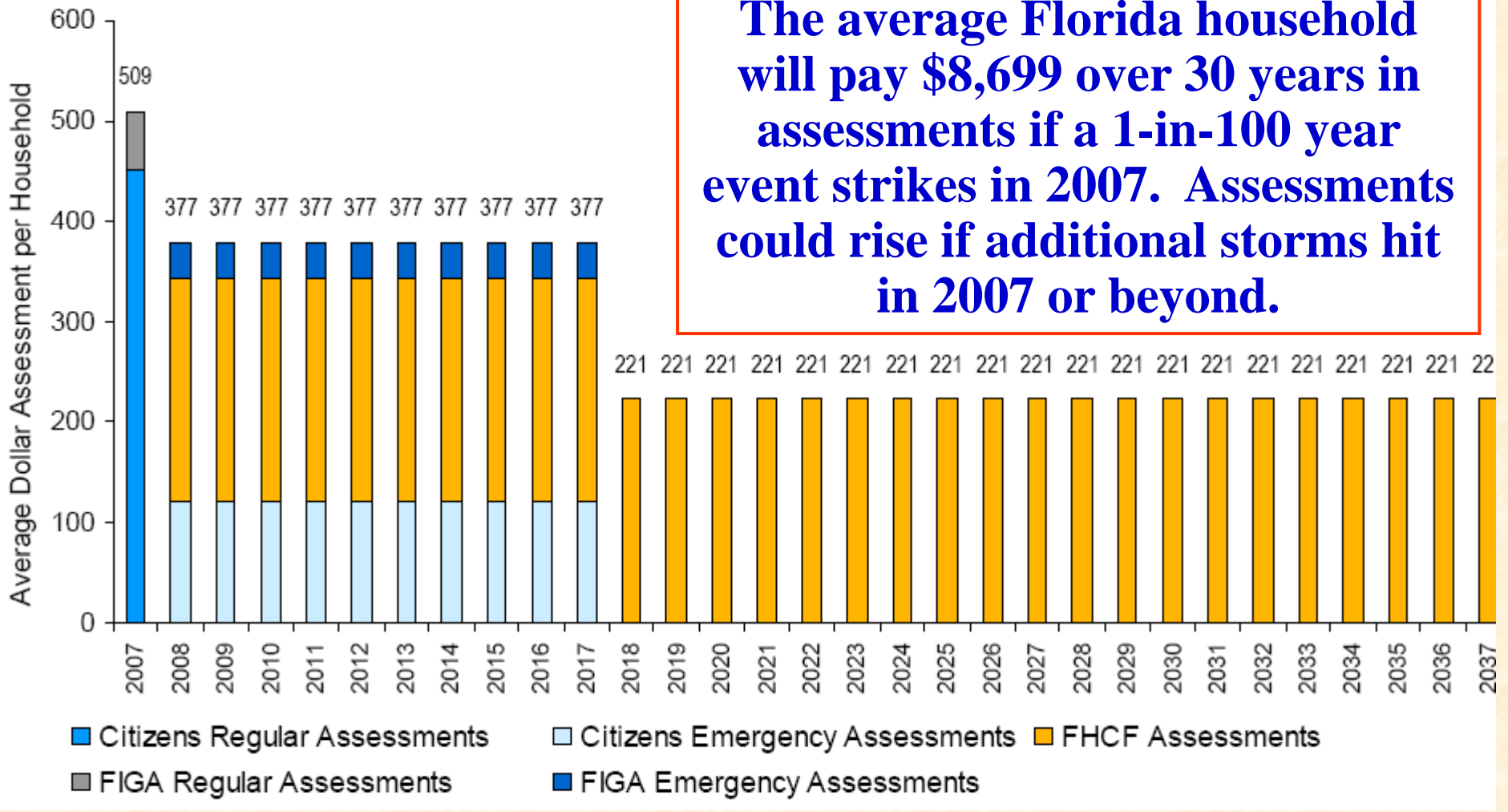
Notes: Assumes average homeowners insurance premium of \$1300 in 2007. Savings for 2007 reflects 24.3% savings on hurricane costs, assumed to be 63% of premium. Savings based on statewide OIR estimate. Actual savings may be less. Direct costs include assessments paid by policyholders on home and personal auto premiums. Indirect costs include assessments on commercial lines passed on to policyholders via higher prices. Amounts are in nominal dollars, or the total cost of borrowing including finance charges over the term of the bond.

Source: Tillinghast Towers Perrin, *Study of Recent Legislative Changes to Florida's Property Insurance Mechanisms*, 3/07.



# Average Annual Assessment per

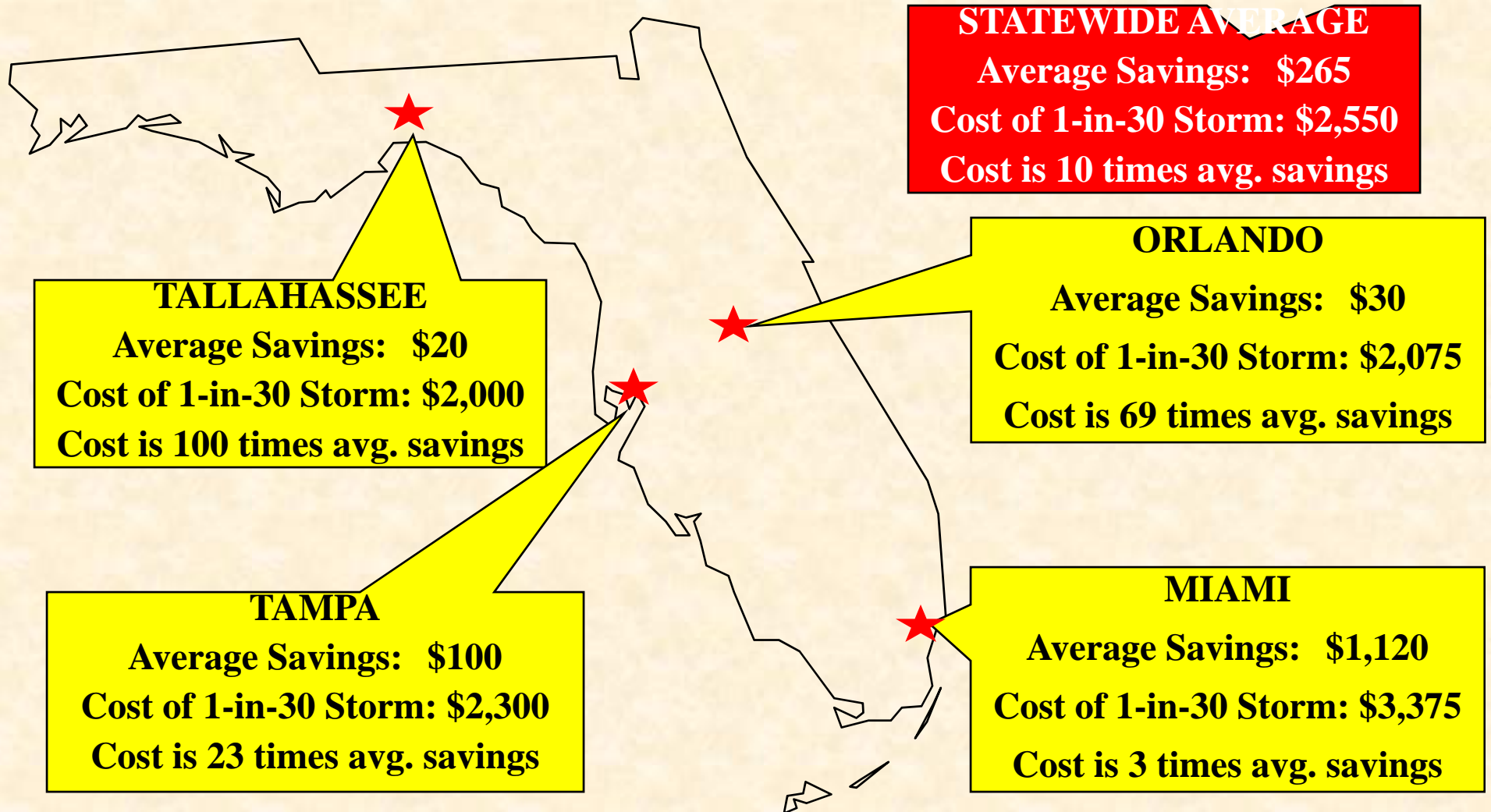
# Household, 1-in-100 Year Event in 2007



Source: Tillinghast Towers Perrin, *Study of Recent Legislative Changes to Florida's Property Insurance Mechanisms*, 3/07.

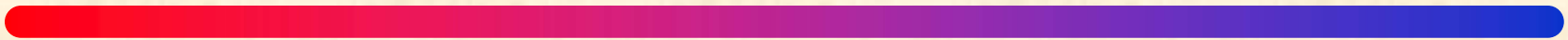


# *Savings vs. Costs by Region:* *Neither Equitable nor Proportionate*



Source: Tillinghast Towers Perrin, *Study of Recent Legislative Changes to Florida's Property Insurance Mechanisms*, 3/07.

# Recommendations





# *Recommendations for*

## *Controlling Hurricane Exposure*

- **Raise public awareness of risk**
  - Mandatory risk disclosure in all residential real estate transactions
  - Require signed waivers if decline flood coverage that also waive rights to any and all disaster aid, or
  - Mandate flood coverage
- **Continue to strengthen & enforce of building codes**
- **Allow markets to determine all property insurance rates**
  - Role of state focused on difficult-to-insure or income issues
- **Increase incentives to mitigate**
- **Require state-run insurer to charge actuarially sound rates and limit high value exposure**
- **Require communities/counties to a financial stake in their catastrophe exposure**
  - Reimburse disaster aid to state/federal government



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