



# Insuring Climate Change

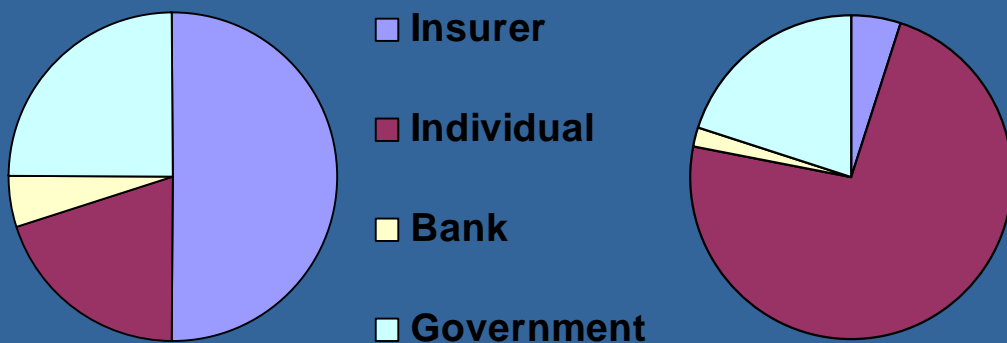
Robert Muir-Wood

17<sup>th</sup> November 2005

## IPCC 4<sup>th</sup> Assessment Report: focus on Catastrophe Risk Bearing

Developed

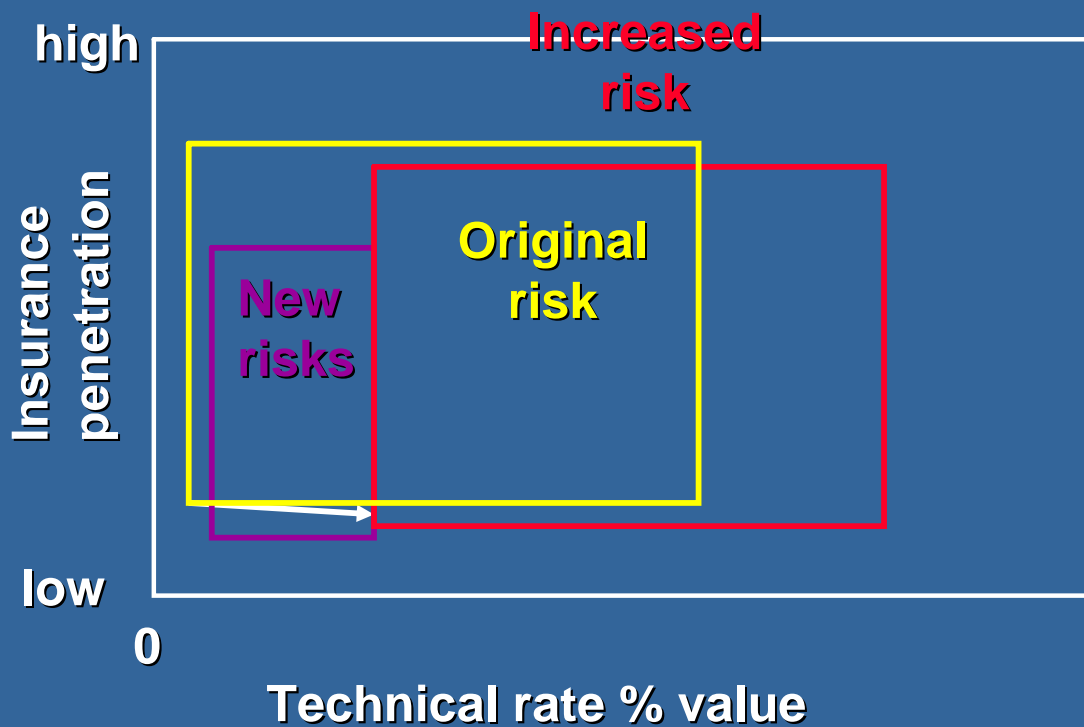
Developing



- What does an increase in catastrophes mean for changes in risk bearing?
- What can the insurance industry do to ensure that it remains socially relevant in protecting individuals and businesses?



## Climate Change Risks



## What are 'new risks'?

- Anywhere that climate has increased the probability of economic loss
- (or where people previously did not think to insure)
  - Ski resorts
  - Agriculture (drought)
  - Forest (fire)
  - Water
- However when risk rises too high it will become uninsurable

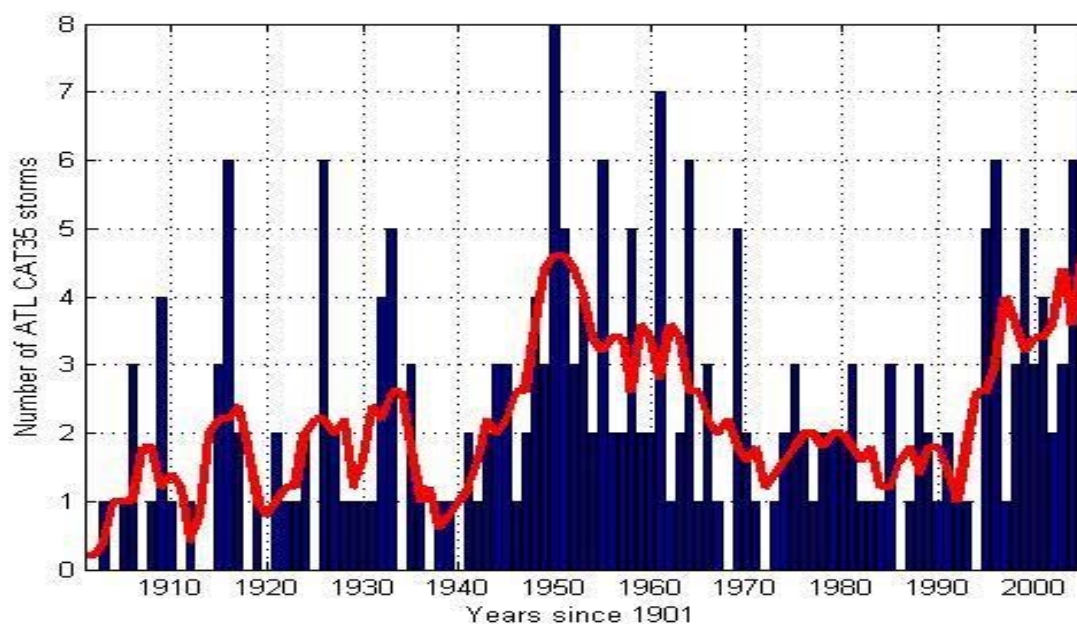


## Property Insurance and Climate Change

- Frontline issue is flood
- Case Study: rising Atlantic/Caribbean Hurricane activity
  - Much development undertaken in quiet hurricane periods of 1960s-1990s
  - 2004 & 2005 seasons have highlighted the future issues around climate change
  - How does insurance cover the risk and how has the insurance industry responded?



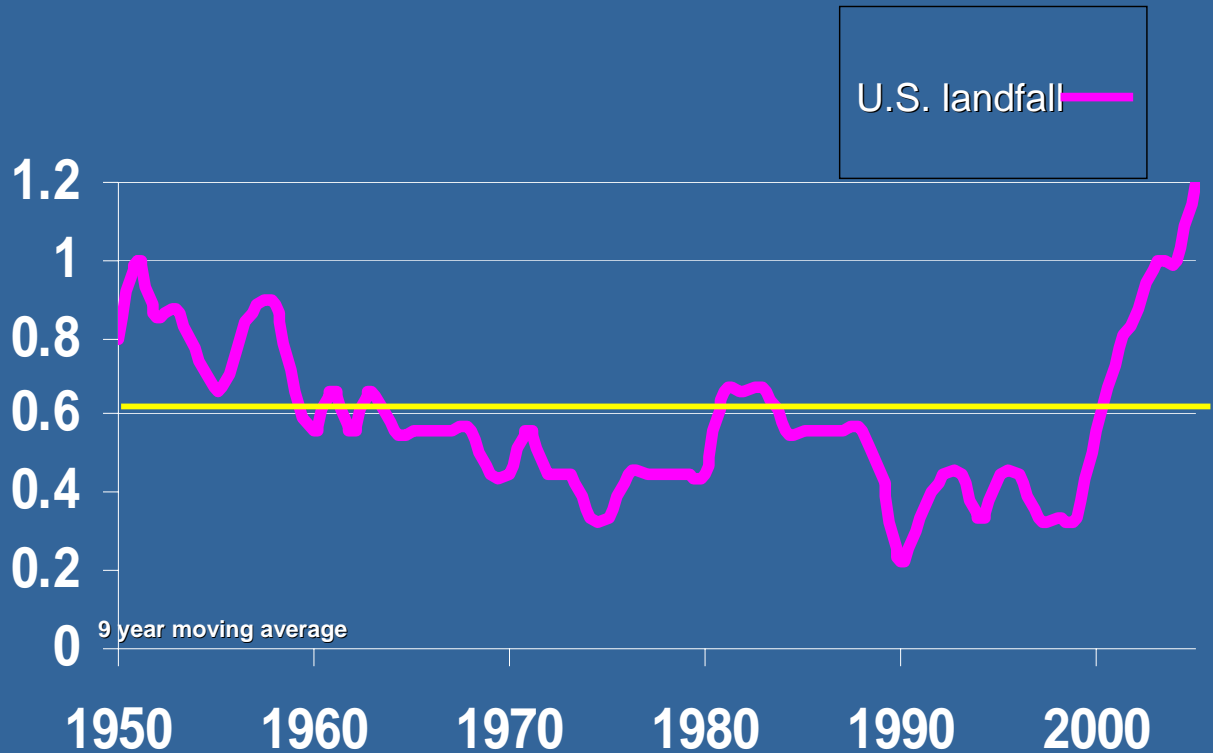
## Atlantic basin hurricane activity has shown a marked increase since 1995



Category 3-5 Atlantic basin hurricanes  
1901-2005 and 5-year running average



## Cat 3-5 Hurricanes



## The US system of Hurricane insurance coverages

- Fire policies cover wind losses – 70-80% penetration
  - However excludes inundation flooding
- Prices charged based on modeled losses (as accepted by elected State insurance commissioners)
- Public Underwriting Associations/Wind Pools provide cover for people who cannot get private wind insurance (backed by the State)
- In designated flood zones residential (and low value commercial) policies can buy Federal NFIP insurance
  - NFIP policy does not cover alternative living expenses/ BI and only pays out up to \$250K for residential (\$500K for commercial)
- NFIP banded rates tend to cross subsidize highest risk locations (that include high value beach front properties)
- Higher value commercial properties in identified flood zones will buy additional private insurance flood protections

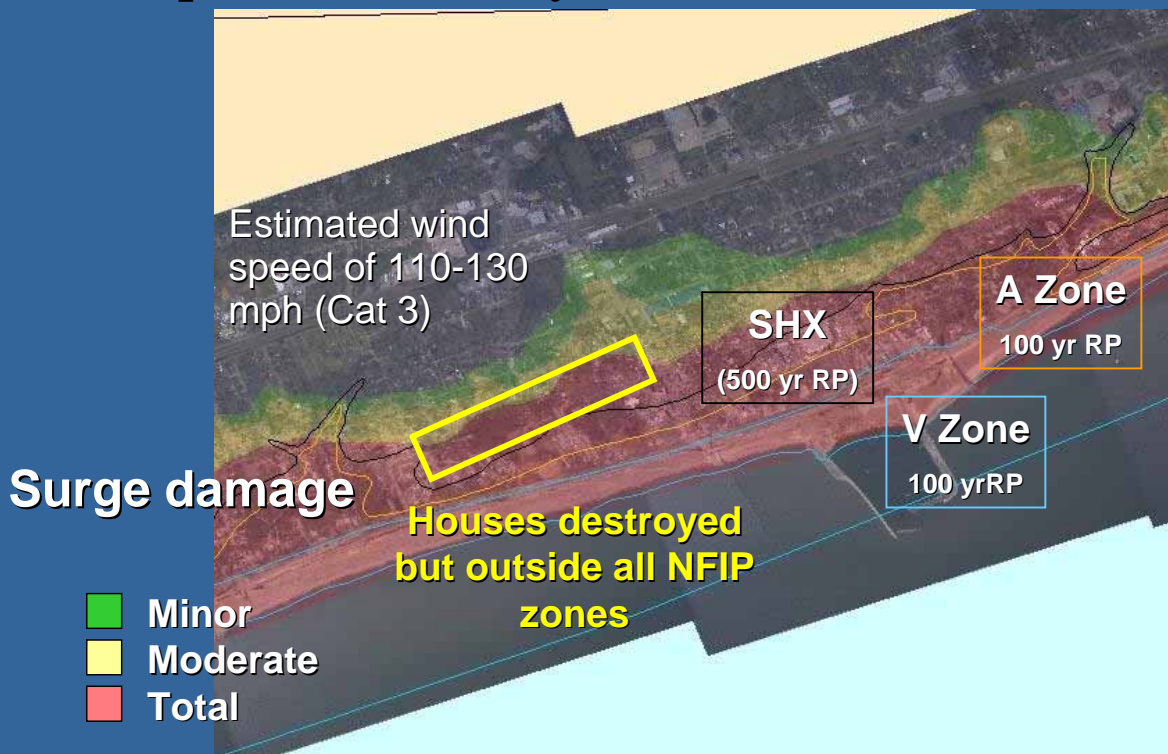


# Gulfport - Satellite imagery from NOAA

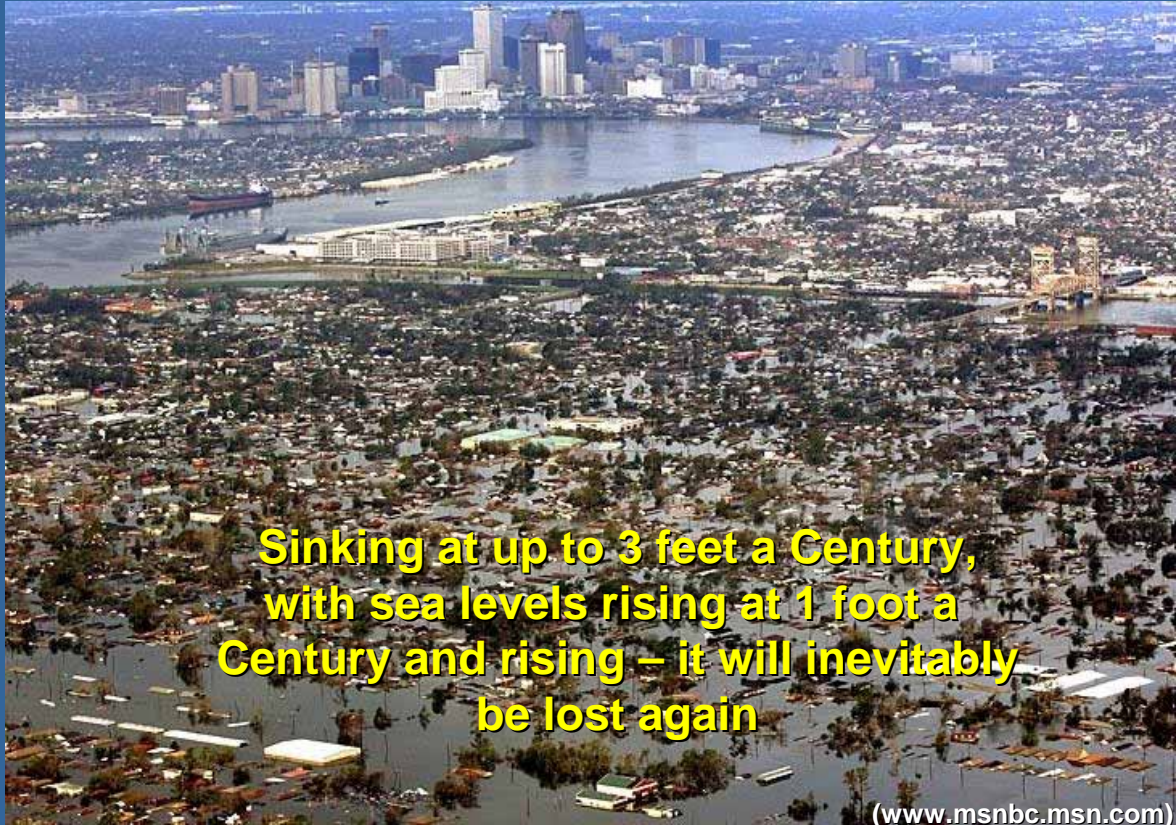
- Total losses along the immediate coastline



# Lessons for flood risk zoning in the Mississippi Coastal Floodplain affected by Katrina



# New Orleans: The First City 'Lost To Climate Change?'

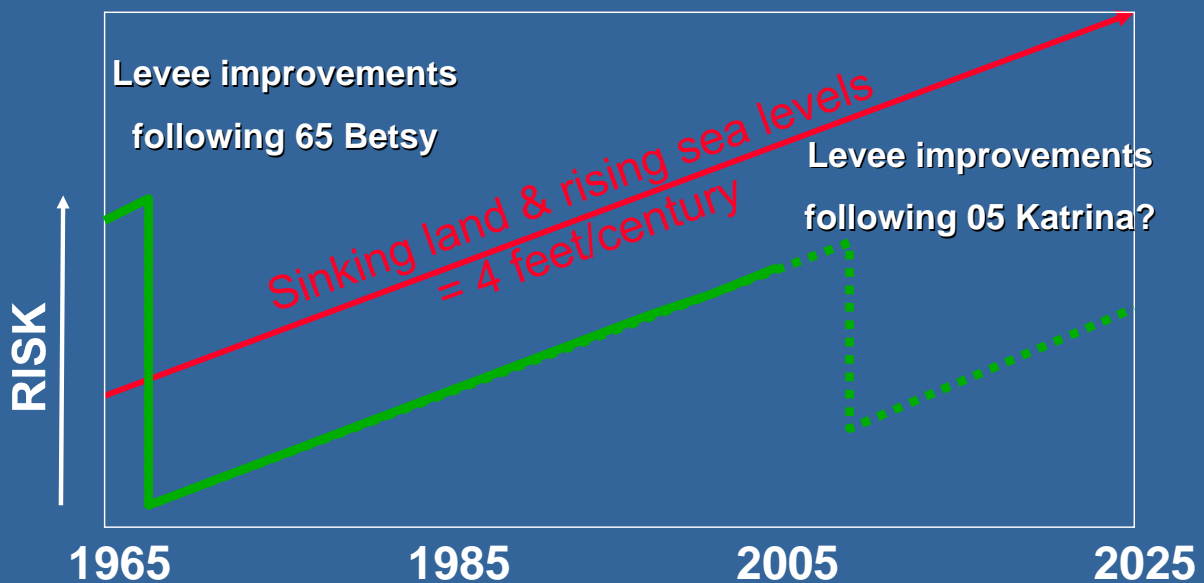


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## Flood Risk in New Orleans



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## **The US system of Hurricane insurance coverage – how did it respond to Katrina – further Nationalization of Insurance?**

- In settling claims - many arguments about the cause of damage – wind or surge - (in particular for houses completely destroyed)
  - Neighbours ‘saw the house blowing down the street before the storm surge hit’.
- Many people whose houses were flooded (and destroyed) – including in New Orleans - lived outside designated flood risk zone
- Litigation underway to try to get private insurers to pay for flood damage.
  - Attorney General in Mississippi suing insurers
- Insurers will now try to put up prices to reflect increased risk
  - State insurance commissioners will demand they keep previous rates
  - Insurers will threaten to exit key states
  - Insurance commissioners will threaten they must stay
- Public are receiving very poor deal
- Hybrid insurance system for hurricane is not sustainable.



## **The Caribbean system of Hurricane insurance coverage**

- Most Caricom countries have inherited UK insurance system
  - All risks coverage including flood
  - Free market – no price controls
  - Insurance only bought by those of middle or high incomes (insurance penetrations 10-60% according to national GDP)
  - No government back-up schemes



**Caribbean  
Canal Estates  
(freeboard)**

0.8m



1.4m



2.5m



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**Ivan 2004 Grand Cayman**



Top of Eastern Avenue opposite C & W

# Cayman 2004 Hurricane Ivan



# Cayman: Coastal wave damage from storm surge

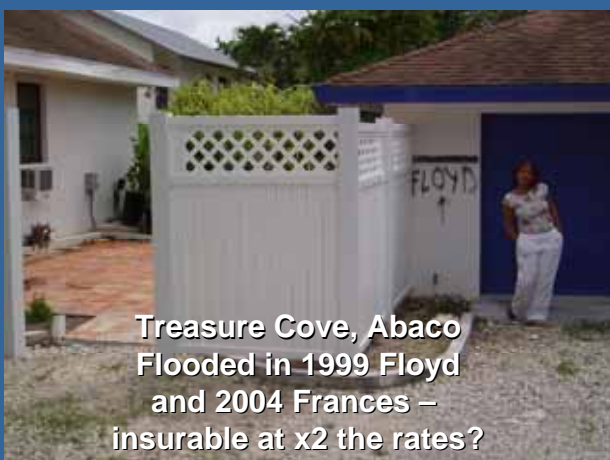


## Caymans and Ivan

- Ivan insurance loss = \$80K per person on Grand Cayman
- Significant increases in insurance costs – rates >2% of value in Caymans
  - High GDP/capita – most people pay the additional costs
- Incentivisations underway to get new buildings elevated out of flood plains.



## Bahamas (middle ranking GDP/Capita)



Treasure Cove, Abaco  
Flooded in 1999 Floyd  
and 2004 Frances –  
insurable at x2 the rates?



The response

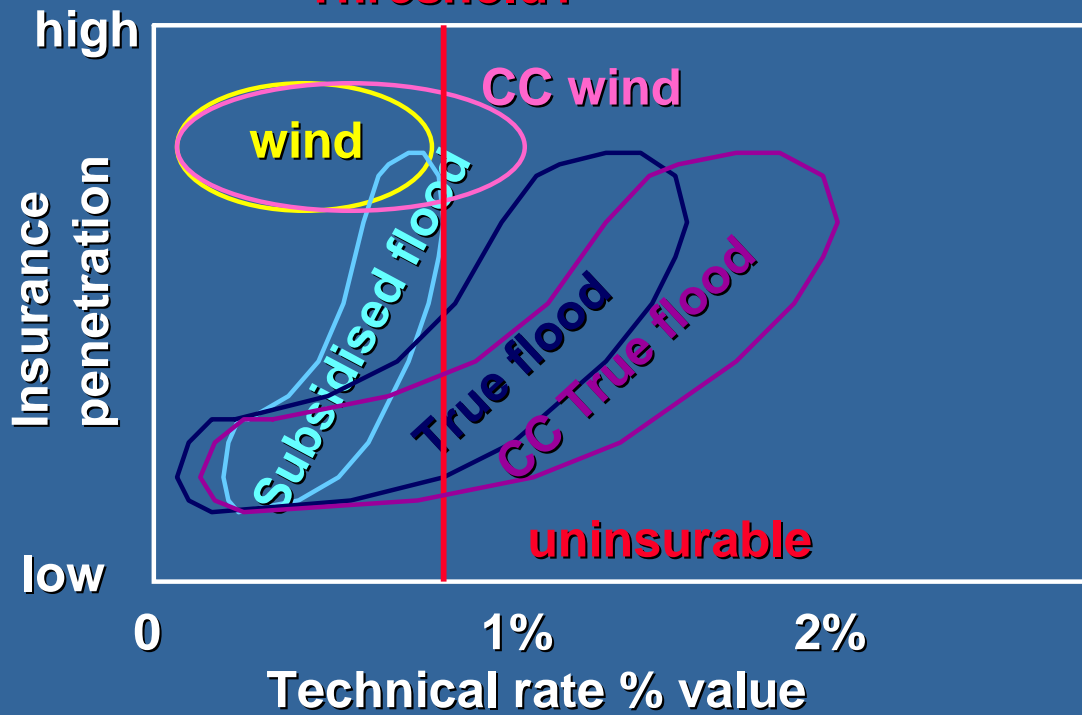
Queen's Cove canal estate  
North Grand Bahama  
Flooded 3 times in 6 years  
No longer insurable

The Caribbean is a testbed for a free market response to a higher hazard world!



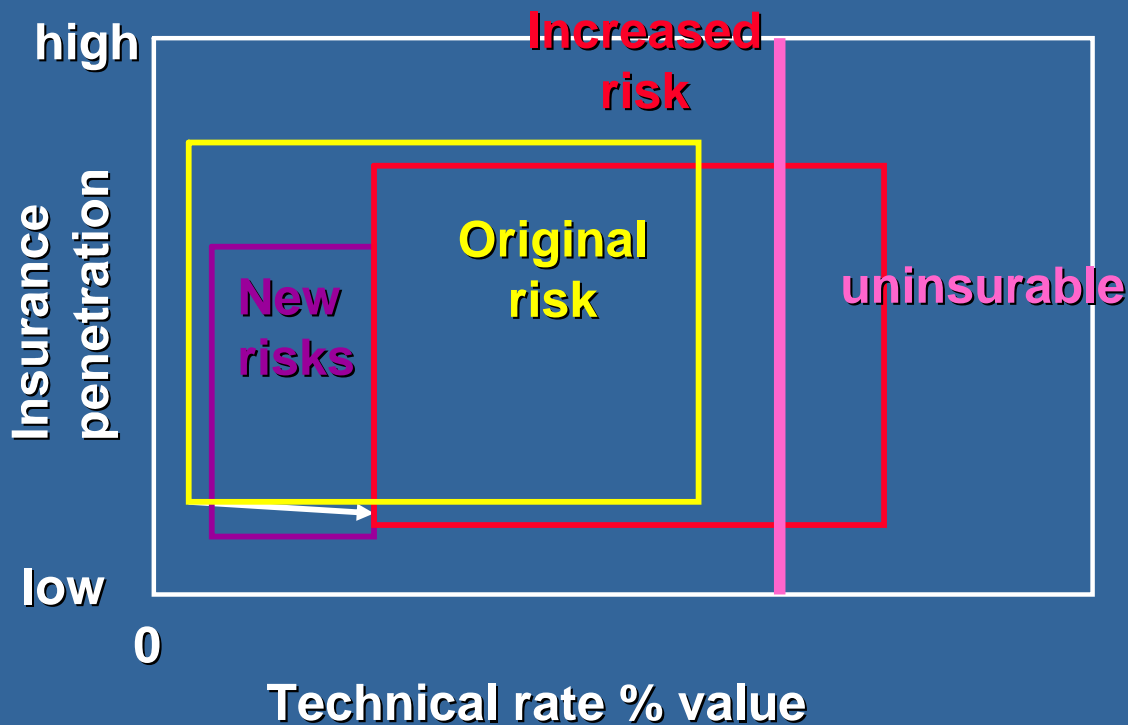
# Insurance – US Hurricane Coastal Counties

## US Premium Threshold?

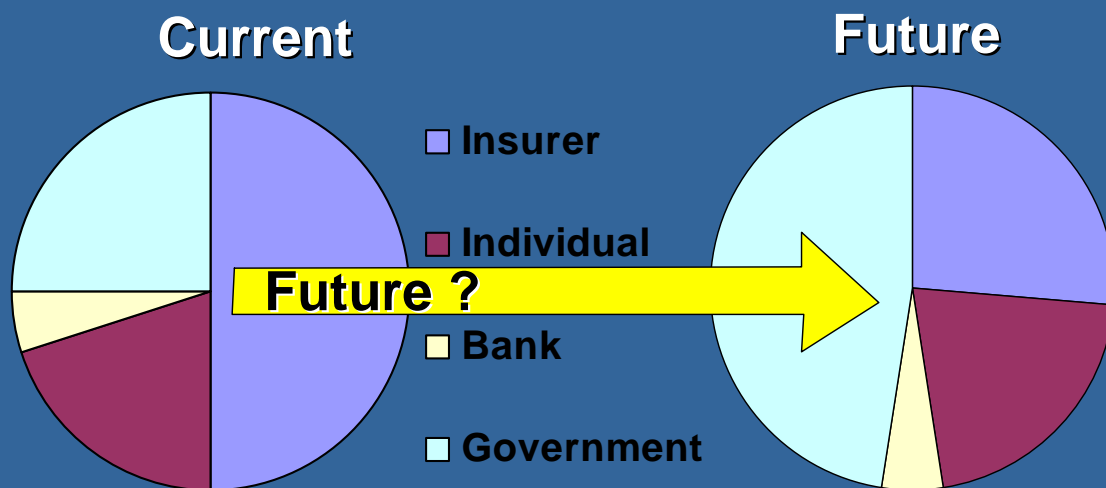


# Climate Change Risks

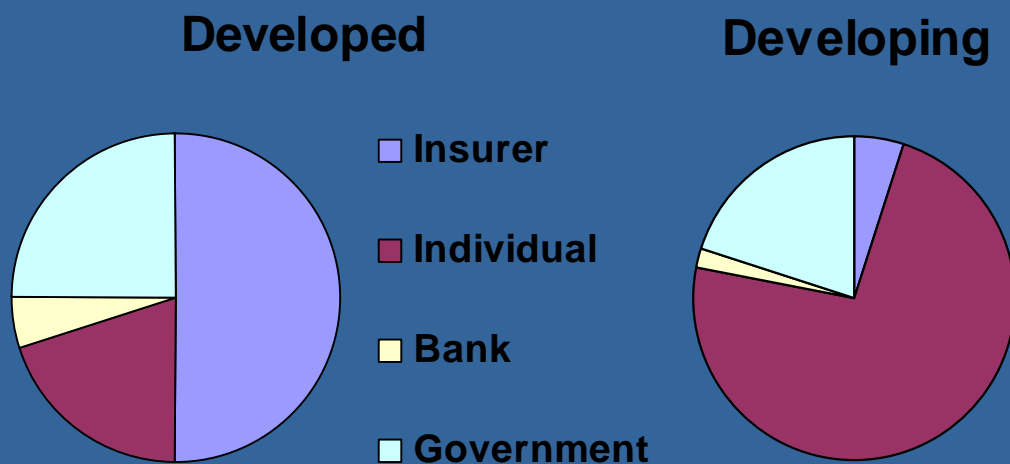
Does the pot of risk grow bigger?



## In the developed world: does the role of Government risk bearing expand as insurers move out?



## Catastrophe Risk Bearing under Climate Change



- What does an increase in catastrophes mean for changes in risk bearing?
  - Governments assume greater proportion of risk bearing in developed world
  - Individuals assume a greater proportion in the developing world

