RISK MODELING AND CALIFORNIA RESIDENTIAL EARTHQUAKE INSURANCE

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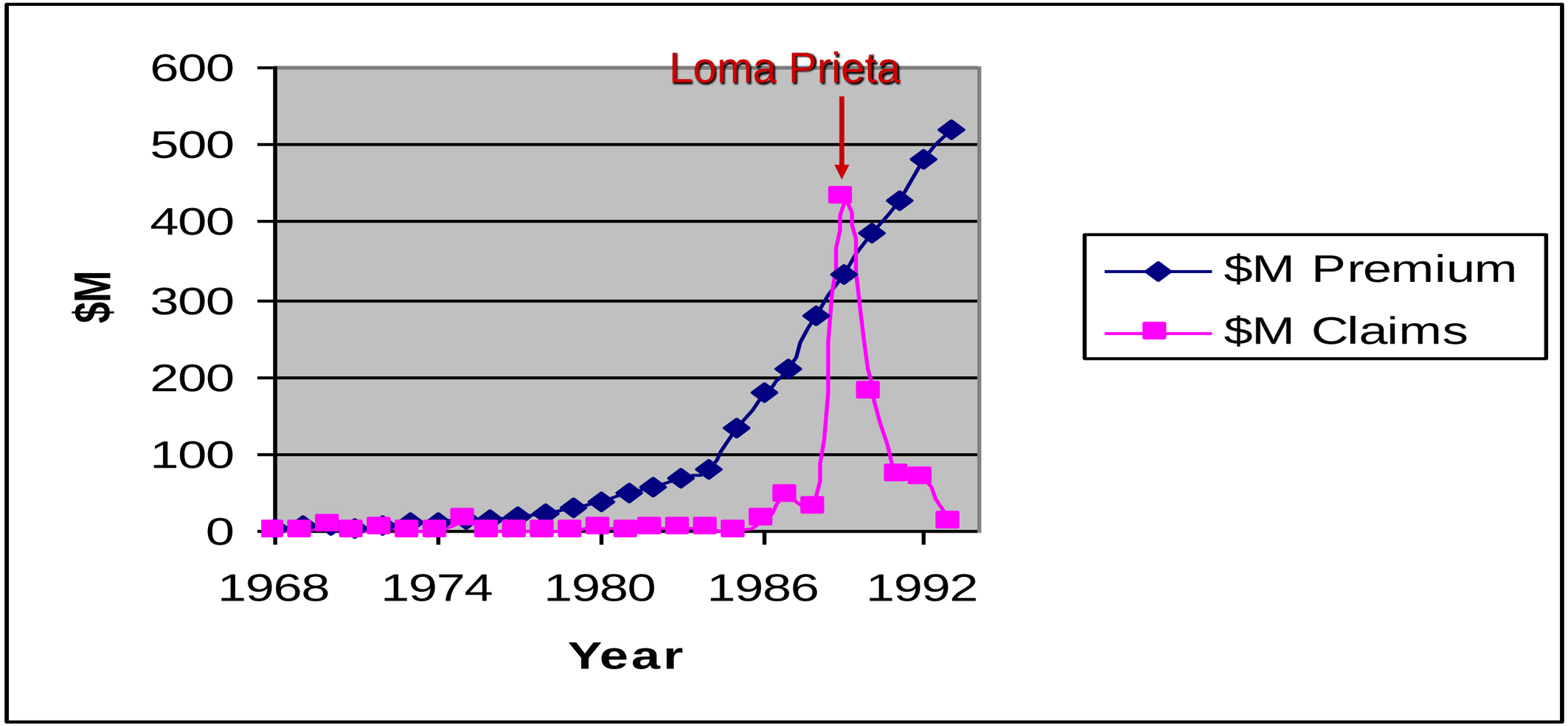
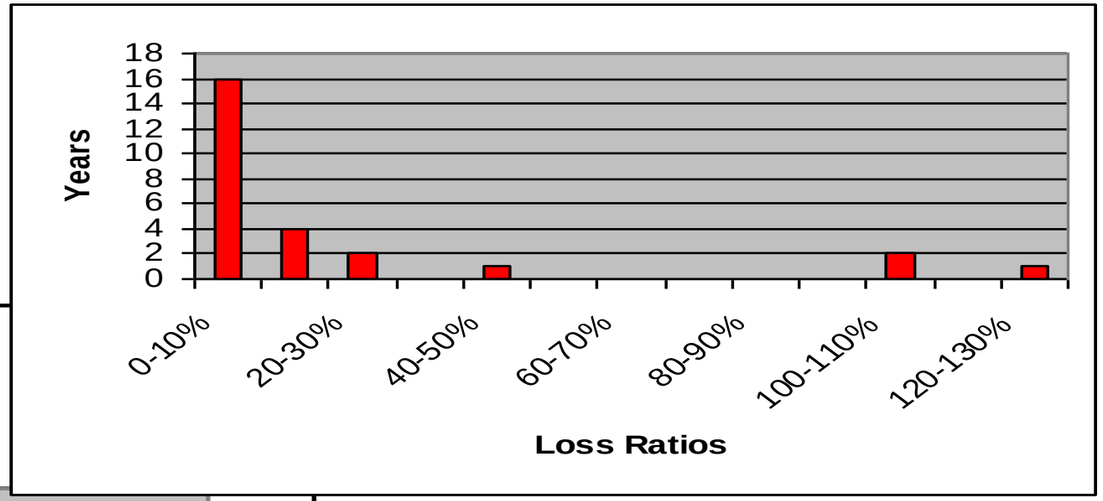
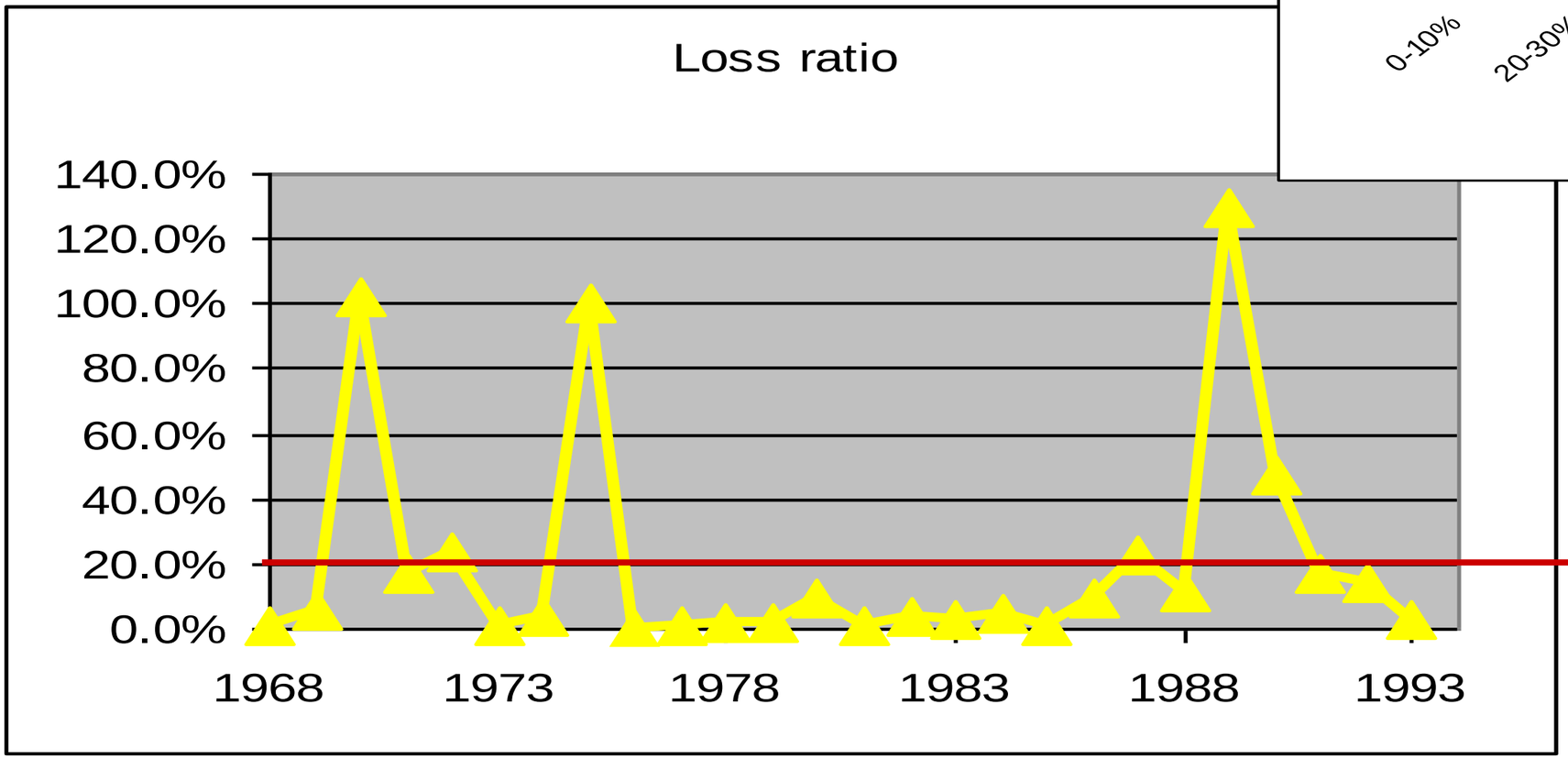
July 9th 2015

CALIFORNIA EARTHQUAKE INSURANCE 1968-1993: A THRIVING AND ‘STABLE’ MARKET

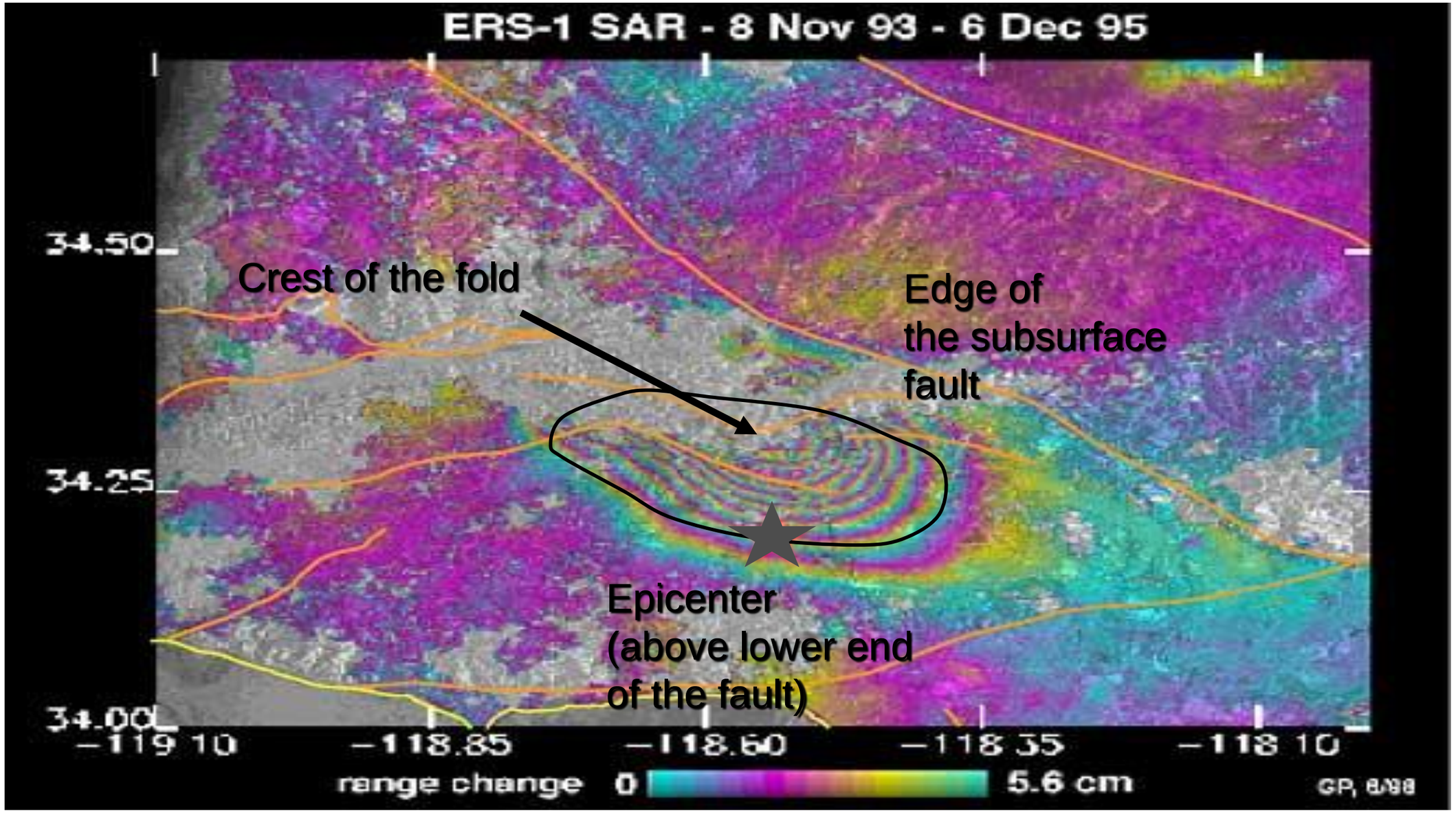


CA EQ INSURANCE: 25 YEARS OF DATA BY WHICH TO PRICE THE BUSINESS

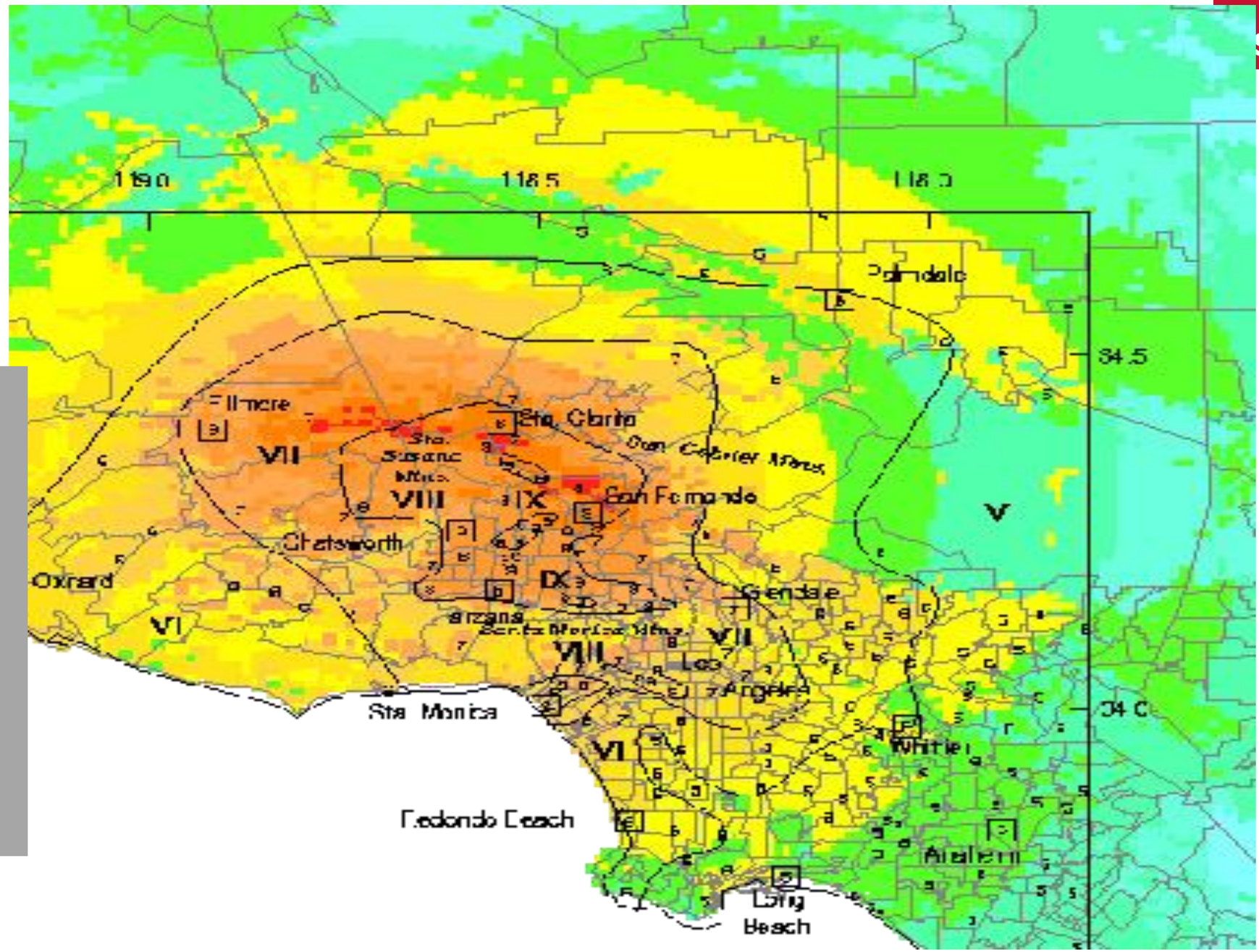




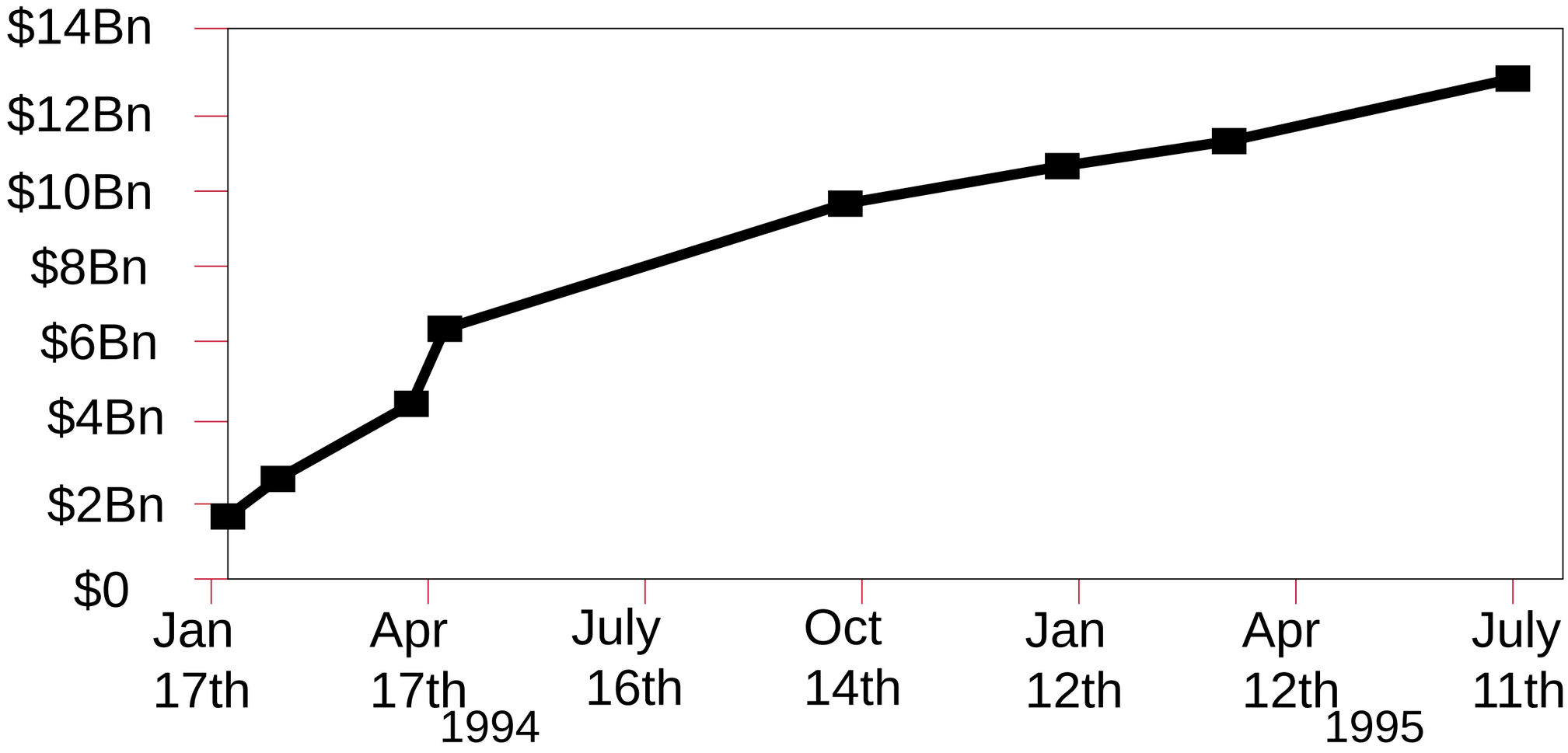
SURFACE DEFORMATION FROM THE NORTHRIDGE BLIND THRUST



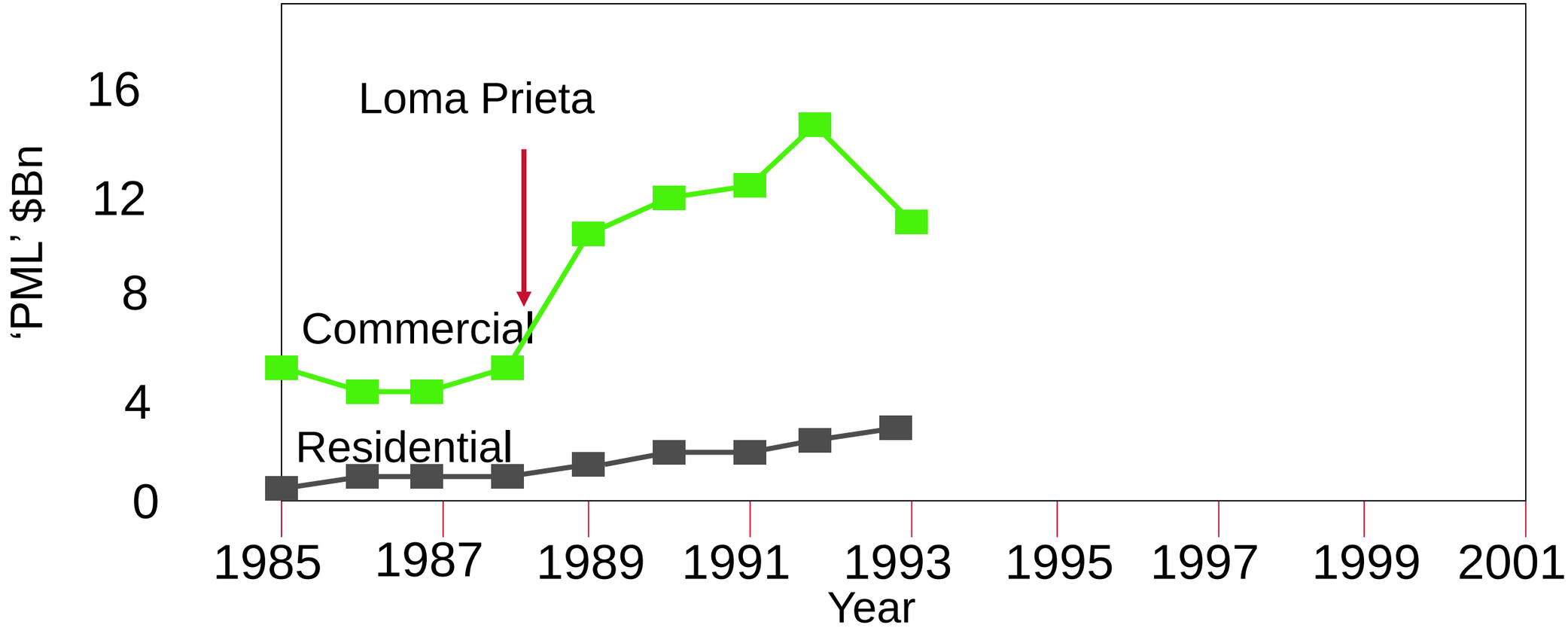
MACROSEISMICS



THE GROWTH IN PROJECTED NORTHRIDGE EQ LOSS



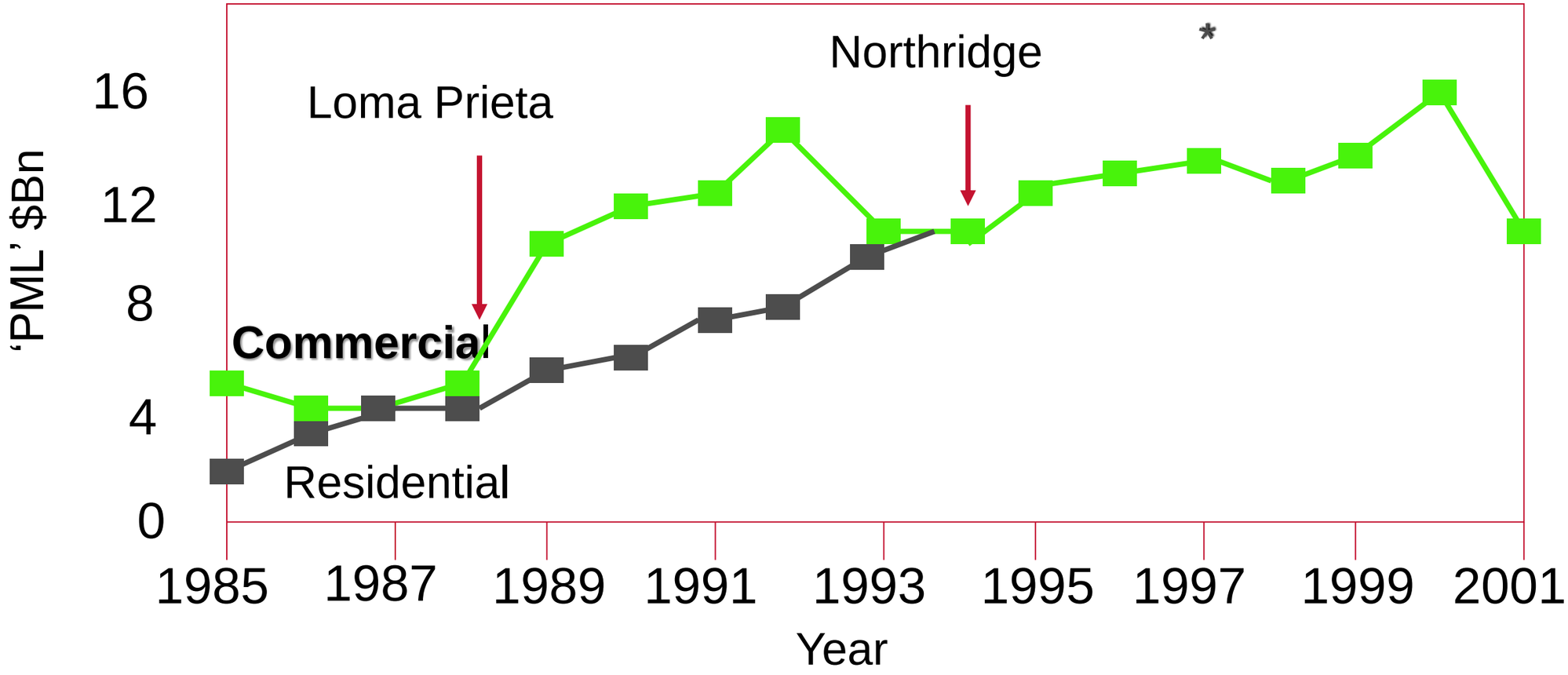
CALIFORNIA DEPARTMENT OF INSURANCE'S METHOD FOR CALCULATING PMLS IN ZONE B (S. CALIFORNIA) – PRE 1994



REASONS FOR NORTHRIDGE RESIDENTIAL LOSS ESCALATION

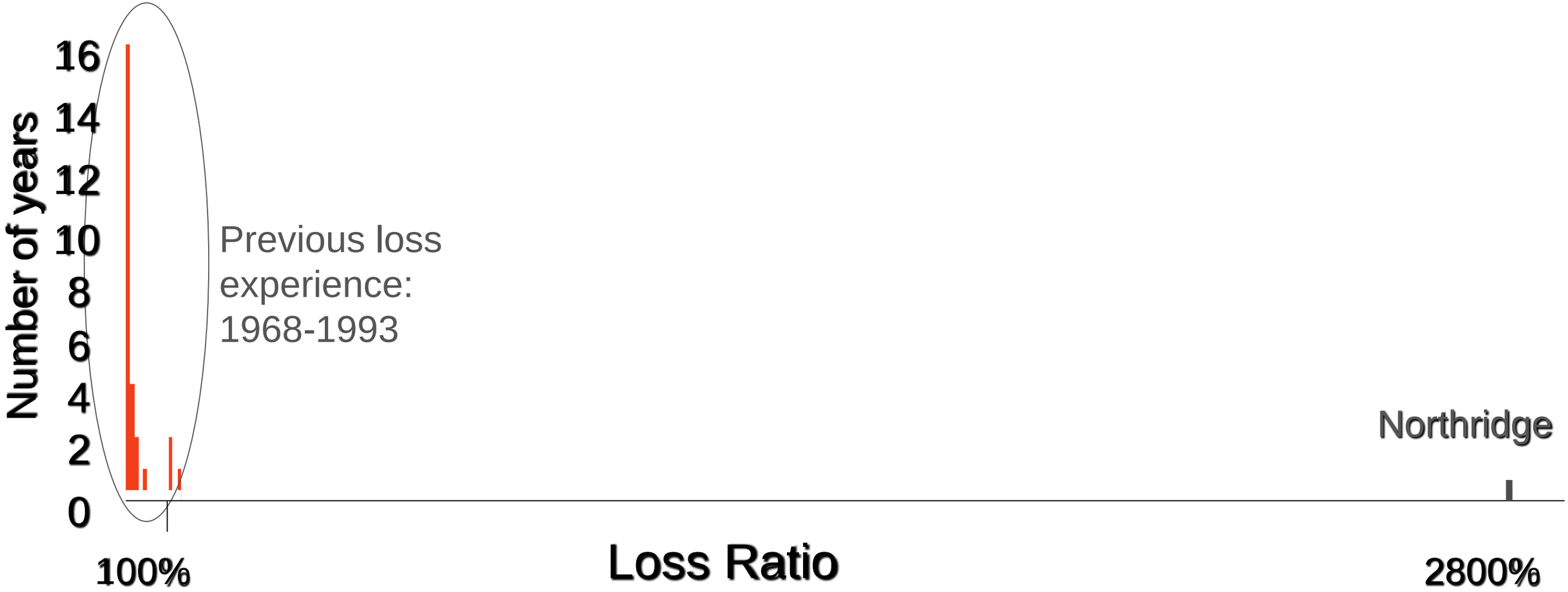
- Properties 15-20% underinsured (but payouts for full value)
- Appurtenant structures x2 the assumed proportion of the property value - and also much more vulnerable than main building
- After taking a beating (from the Insurance Commissioner) following the Oakland Fire of 1991, insurers made little attempt to resist claims (only 0.032% complaint ratio) – as losses increasingly passed to reinsurers
- % of claims above 10% deductible in MMI VIII:
  - ATC13 predicted 3.5%
  - 1989 Loma Prieta 31% (average $15,824)
  - 1994 Northridge 60% (average $42,800 coverage A and B: $31,500 coverage A only)

‘READJUSTED’ PMLS IN ZONE B (S. CALIFORNIA) AFTER NORTHRIDGE



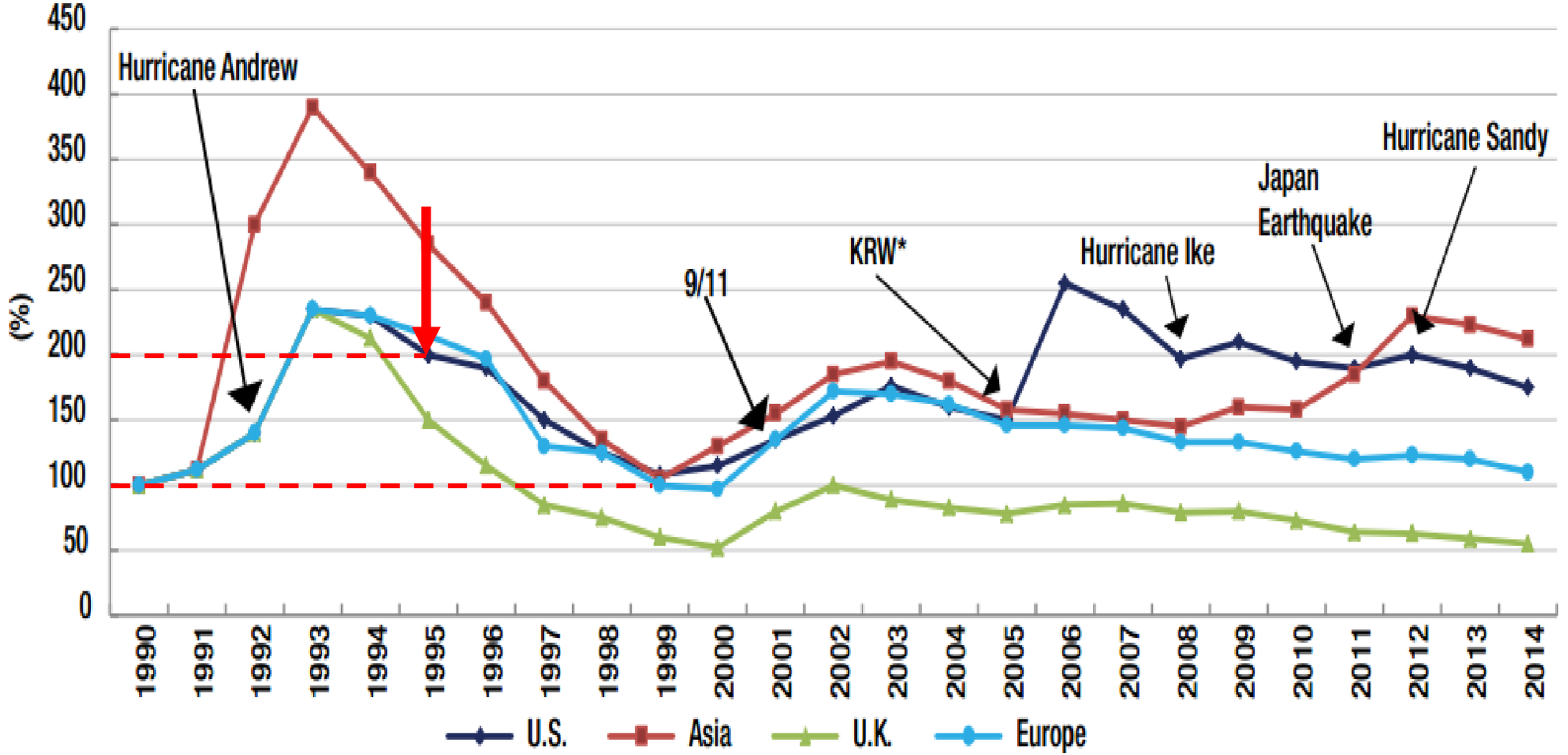
* Commercial rates doubled after Northridge

NORTHRIDGE EQ: THE END OF THE ‘LOSS EXPERIENCE APPROACH’ TO EARTHQUAKE CAT LOSS ESTIMATION



FRAMEWORK FOR LOSS MODELING

Global Reinsurance – Catastrophe Rate On Line Index



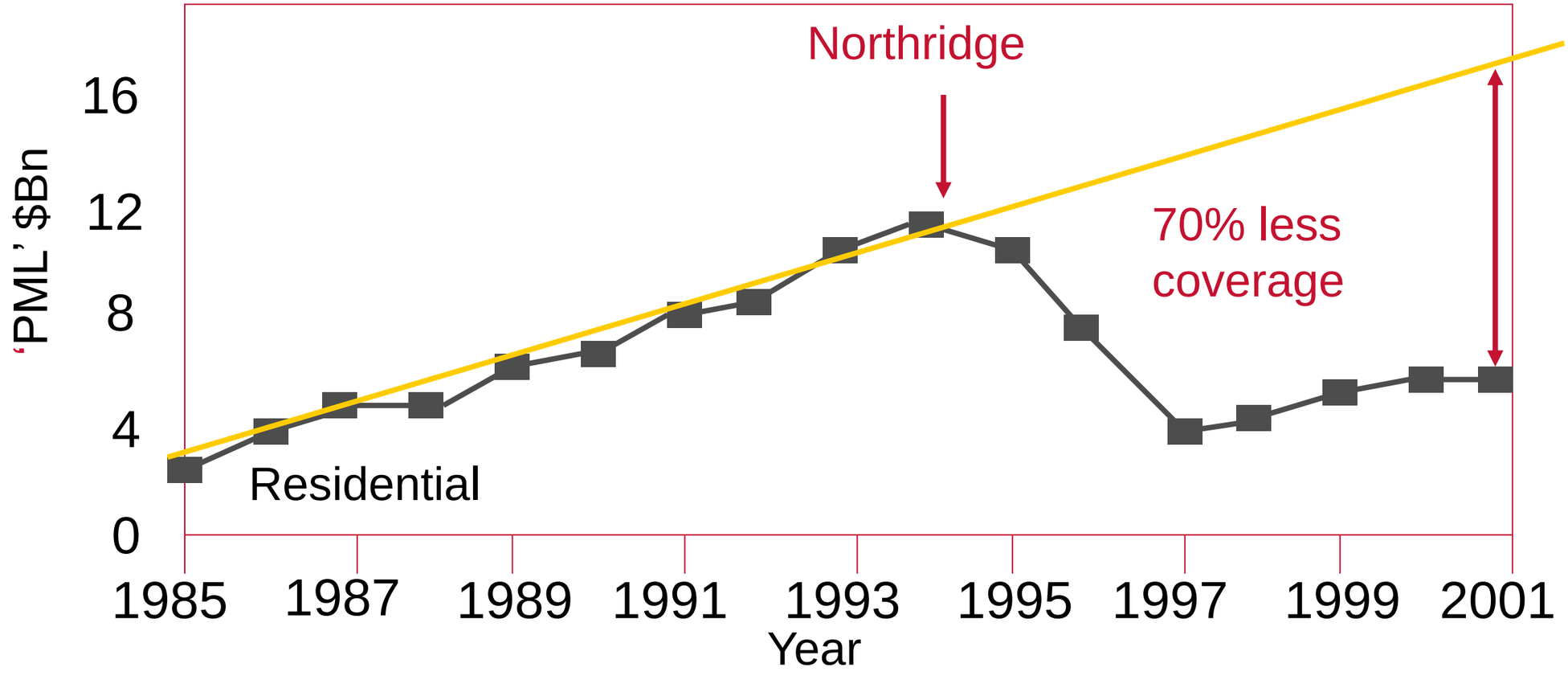
Note: 1990-1993 rate on line price coincides for the U.S., U.K. and Europe, and for the U.S. and Europe in 1994.

* Hurricanes Katrina, Rita & Wilma

Source: A.M. Best research, Guy Carpenter

http://airdc.org/articles/AM%20Best/Global%20Reinsurance%20Segment%20Review-September%202014.pdf

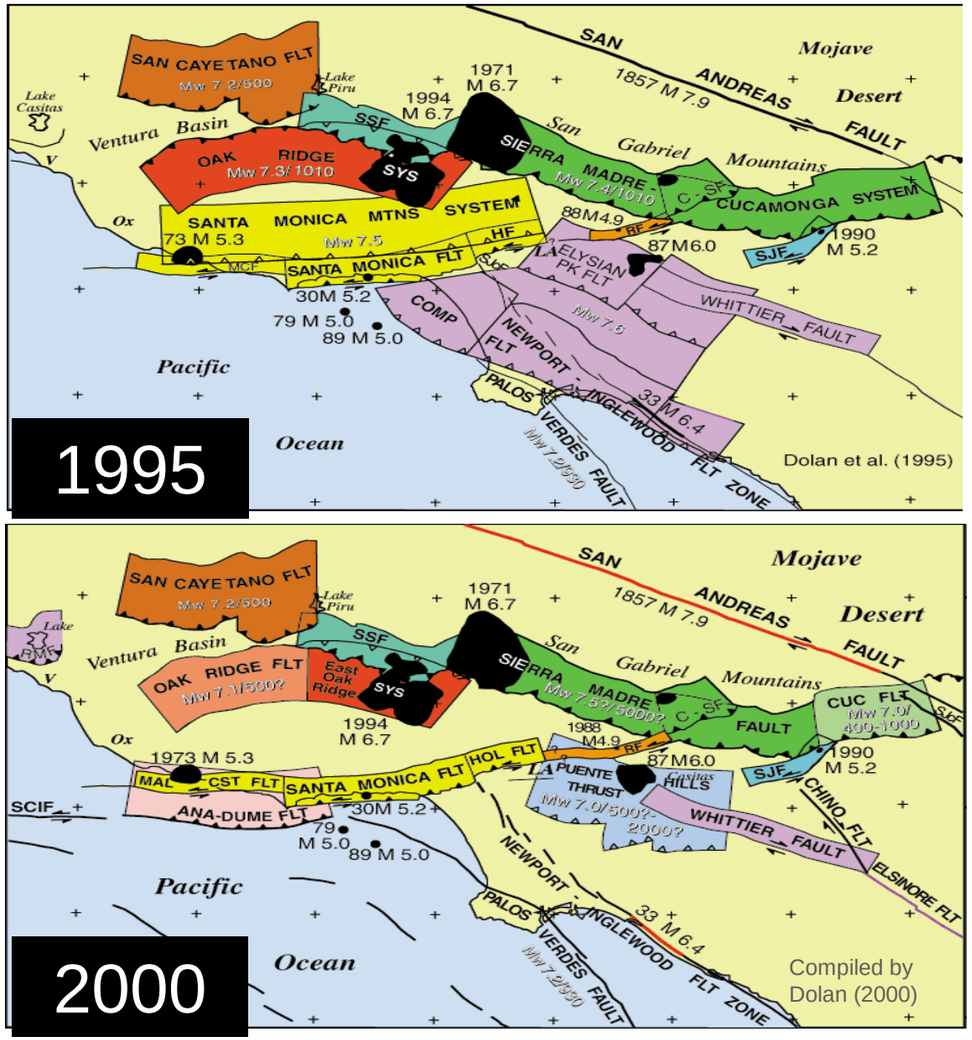
THE DIMINISHING ROLE OF THE INSURANCE INDUSTRY IN PROTECTING AGAINST HOMEOWNERS' EARTHQUAKE LOSS



HAZARD MODELING AFTER NORTHRIDGE: UPDATE OF RATE ASSESSMENTS FOR SEISMIC SOURCES

Blind Thrusts in the LA Region

- Detailed re-evaluation of blind structures
- New structures identified
  - Puente Hills Thrust
  - Anacapa-Dume Thrust
- Probability of activity for some structures reduced
  - Compton Thrust
  - Elysian Park



IMPACT OF NEXT GENERATION ATTENUATION FUNCTIONS AS RECOMMENDED BY THE USGS 2008

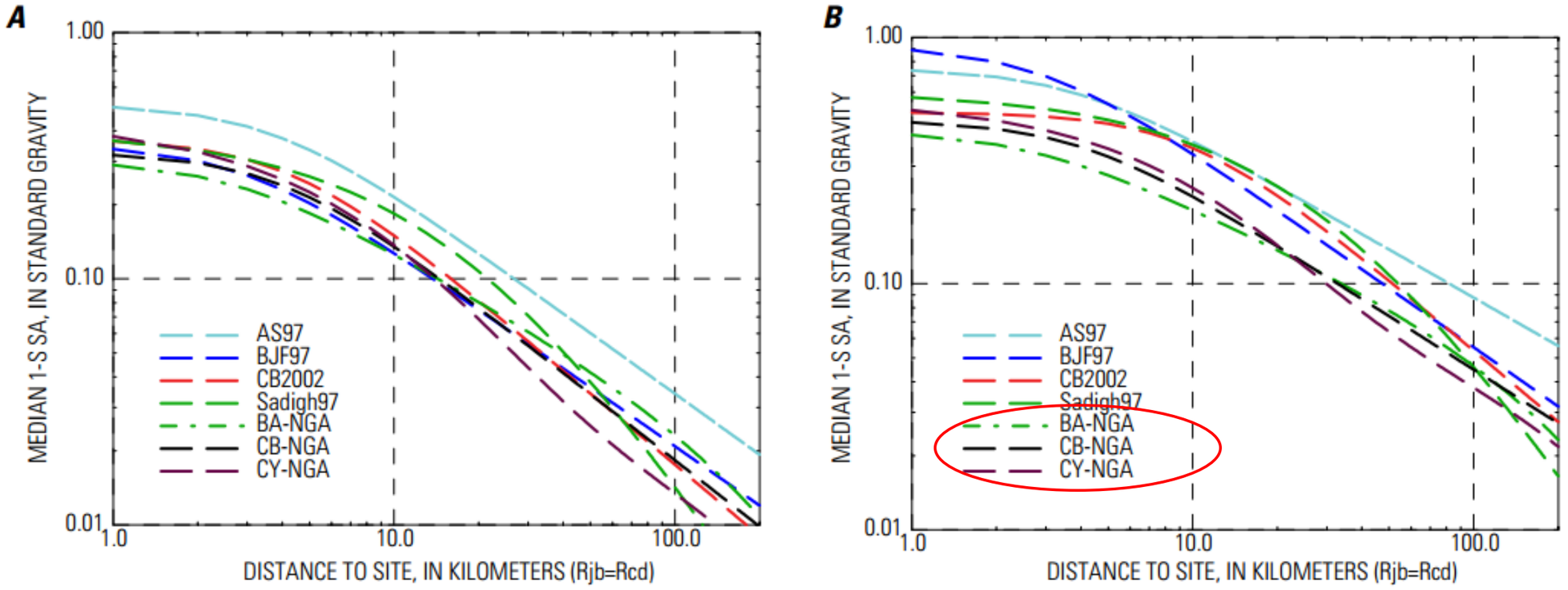
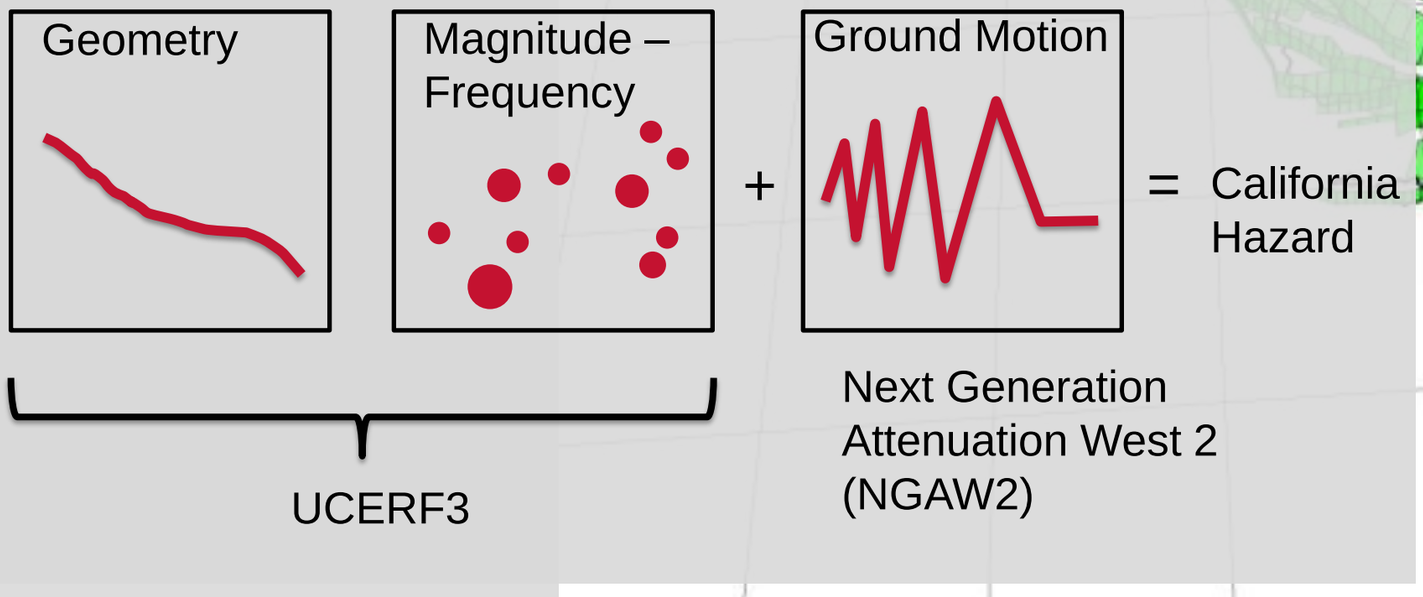


Figure 26. Western United States 1-s spectral acceleration (SA) for (***A***) M6.5 earthquakes and (***B***) M7.5 earthquakes from strike-slip source at firm-rock site based on AS97 (Abrahamson and Silva, 1997), BJF97 (Boore and others, 1997), CB2003 (Campbell and Bozorgnia, 2003), Sadigh97 (Sadigh and others, 1997) BA-NGA (Boore and Atkinson, 2008), CB-NGA (Campbell and Bozorgnia, 2008), and CY-NGA (Chiou and Youngs, 2008).

UCERF3:

- Uniform California Earthquake Rupture Forecast 3

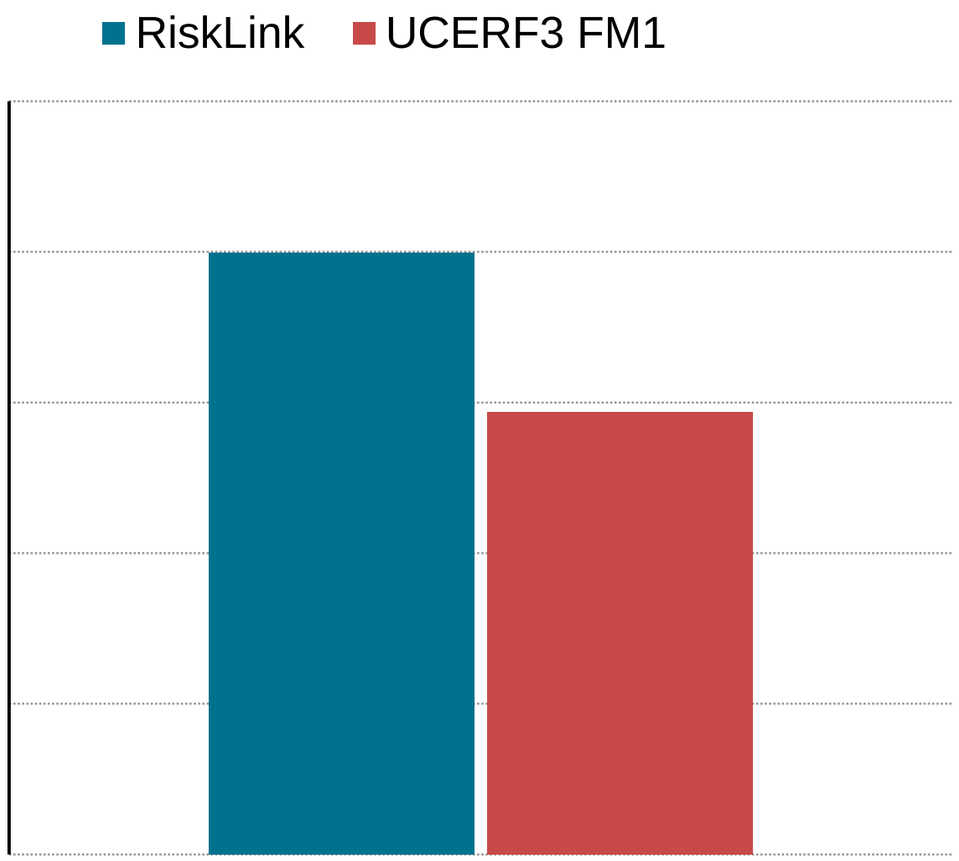


CALIFORNIA PORTION OF 2014 HAZARD MAP IS UCERF3 MODEL

Courtesy of UCERF3 report

PRELIMINARY RESULTS: CALIFORNIA – IED ALL LINES

AAL



CALIFORNIA EARTHQUAKE INSURERS SHOULD BE SET TWO GOALS:

1) RAISE EARTHQUAKE INSURANCE TAKE UP RATES TO (30%) OF HOMEOWNERS

2) ENSURE INSURANCE PICKS UP (>50%) OF THE TOTAL LOSS