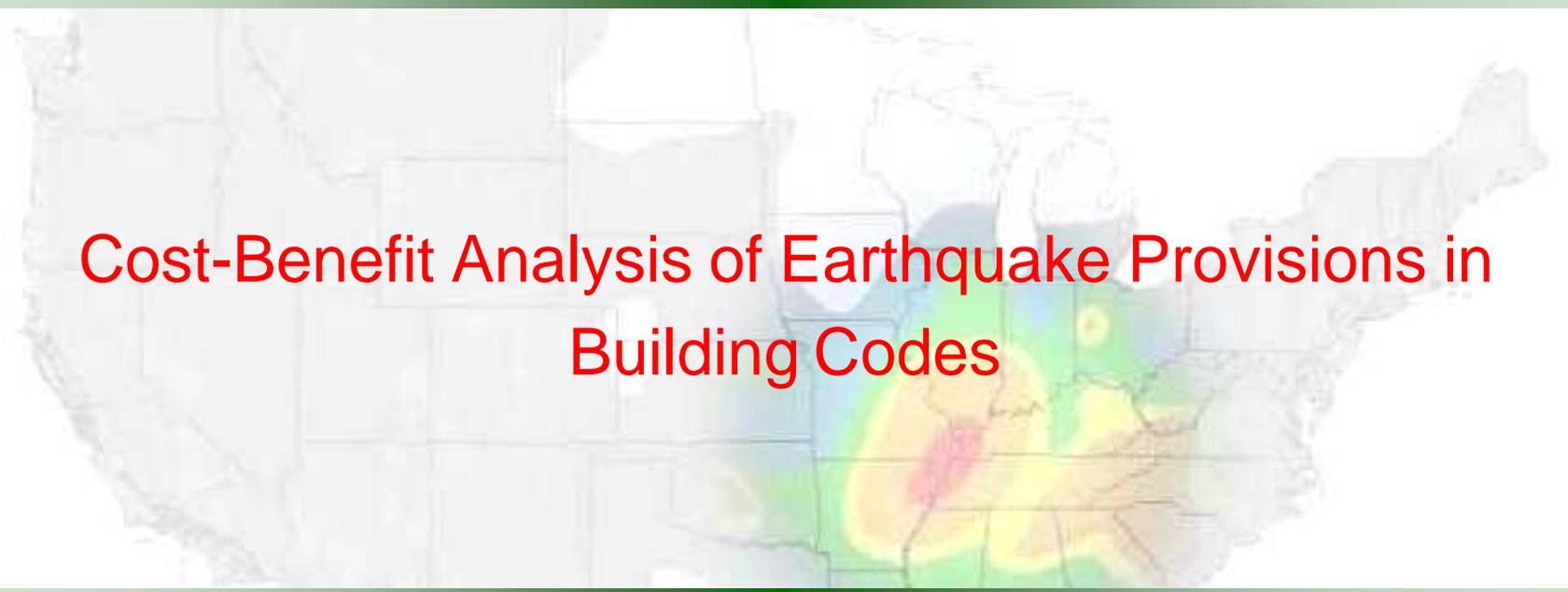


CEUS Workshop on National Seismic Hazard Maps

May 9, 2006

Boston, MA



Cost-Benefit Analysis of Earthquake Provisions in
Building Codes

Erdem Karaca

Mendenhall Postdoctoral Fellow

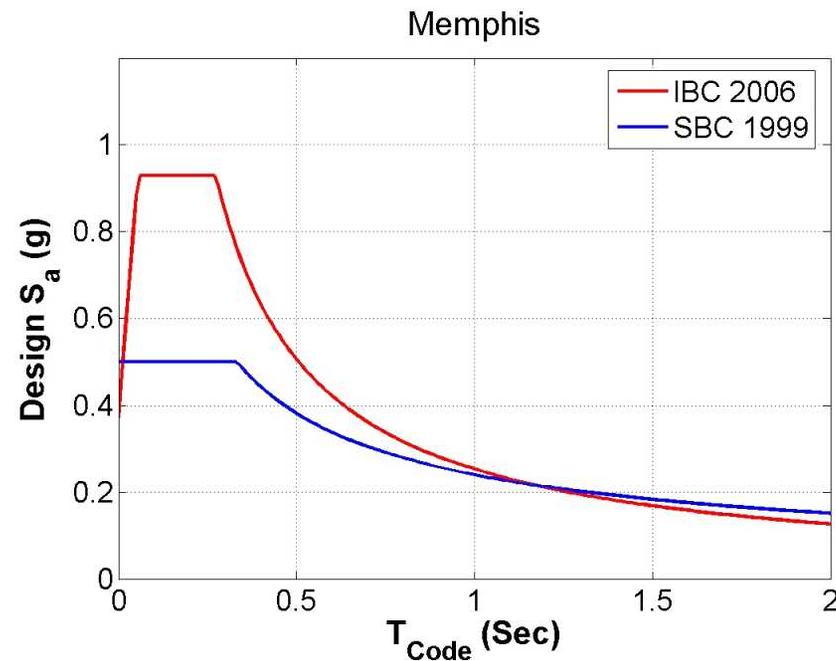
US Geological Survey

Golden, CO



UBC, SBC, BOCA/NBC => IBC

- Changes in seismic design ground motions
- Changes in seismic design category definitions
- ...



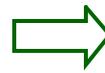
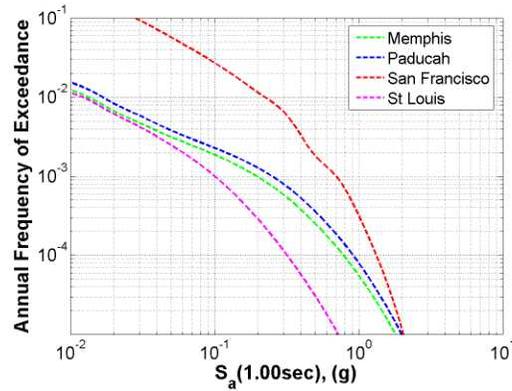
- What are the effects of these changes on seismic design => building vulnerability => costs & losses?

Approach: SBC => IBC

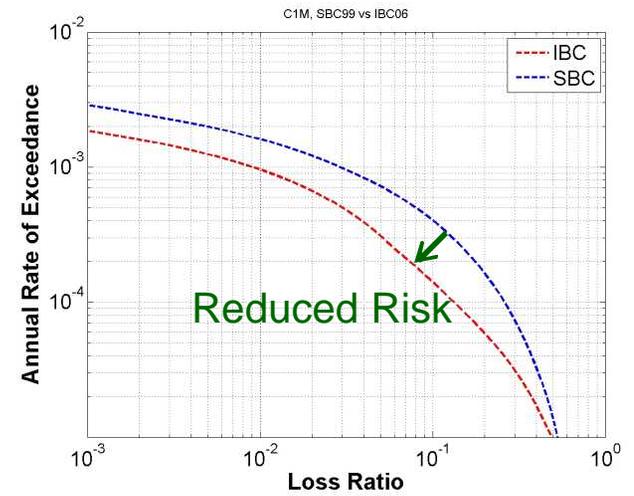
Inventory



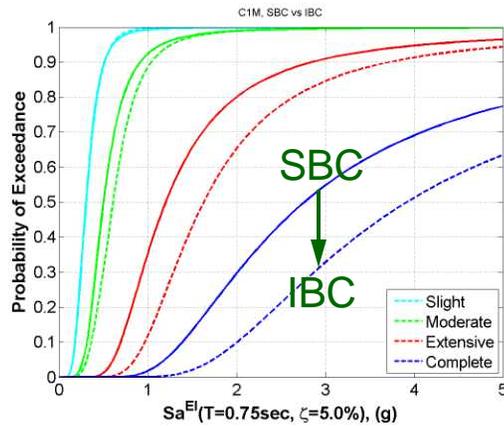
Hazard



Loss/Risk



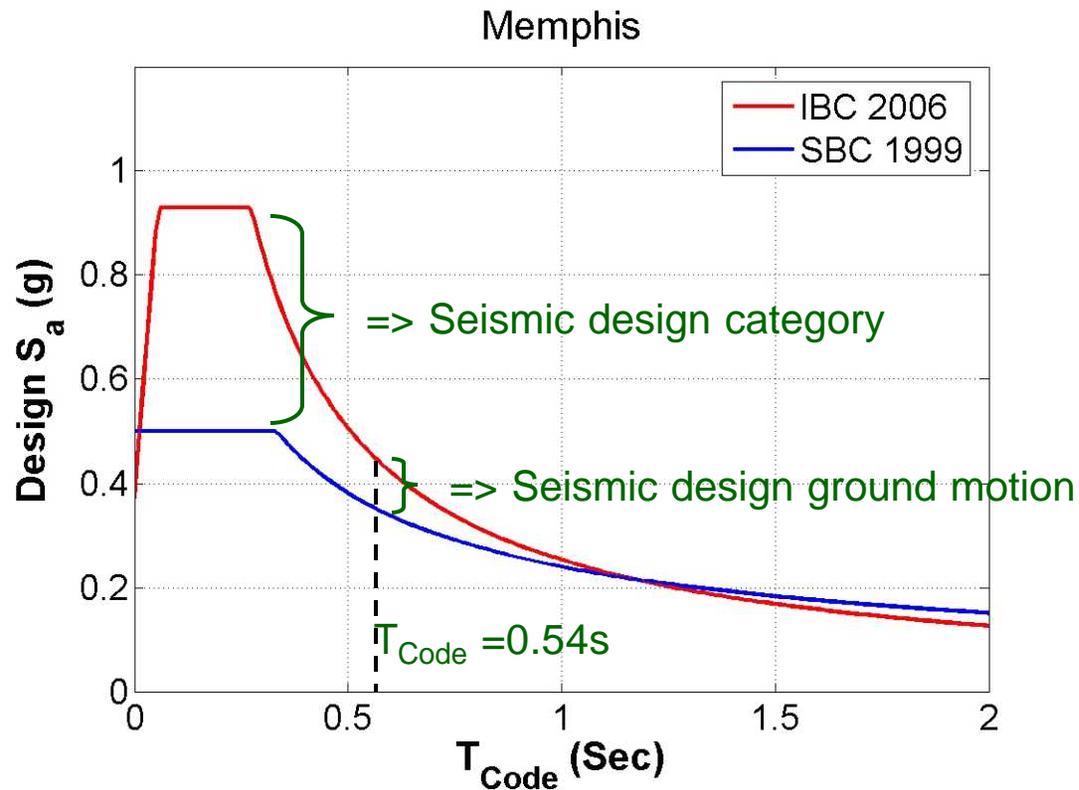
Cost?



Vulnerability

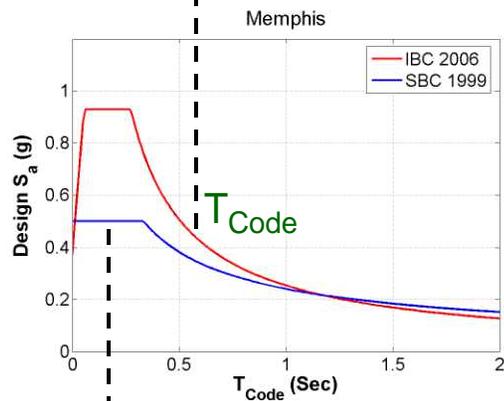
Approach SBC => IBC

- Changes in seismic design ground motions
- Changes in seismic design category definitions
- ...



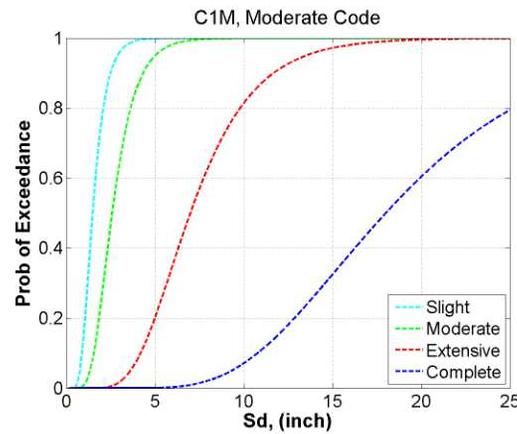
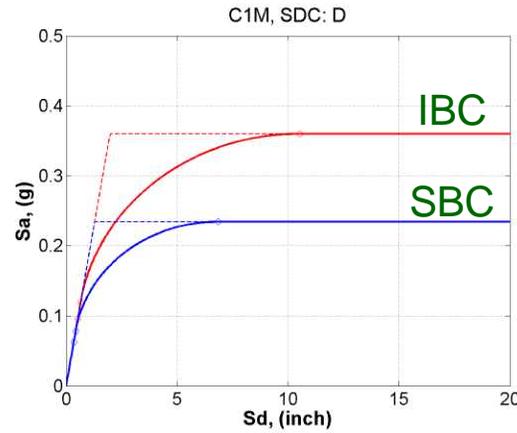
Approach: SBC => IBC

Design ground motion

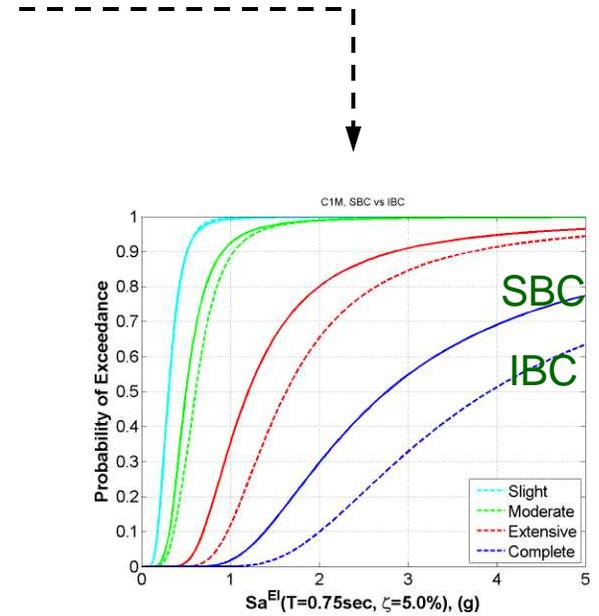


Seismic Design Category

Capacity Curve

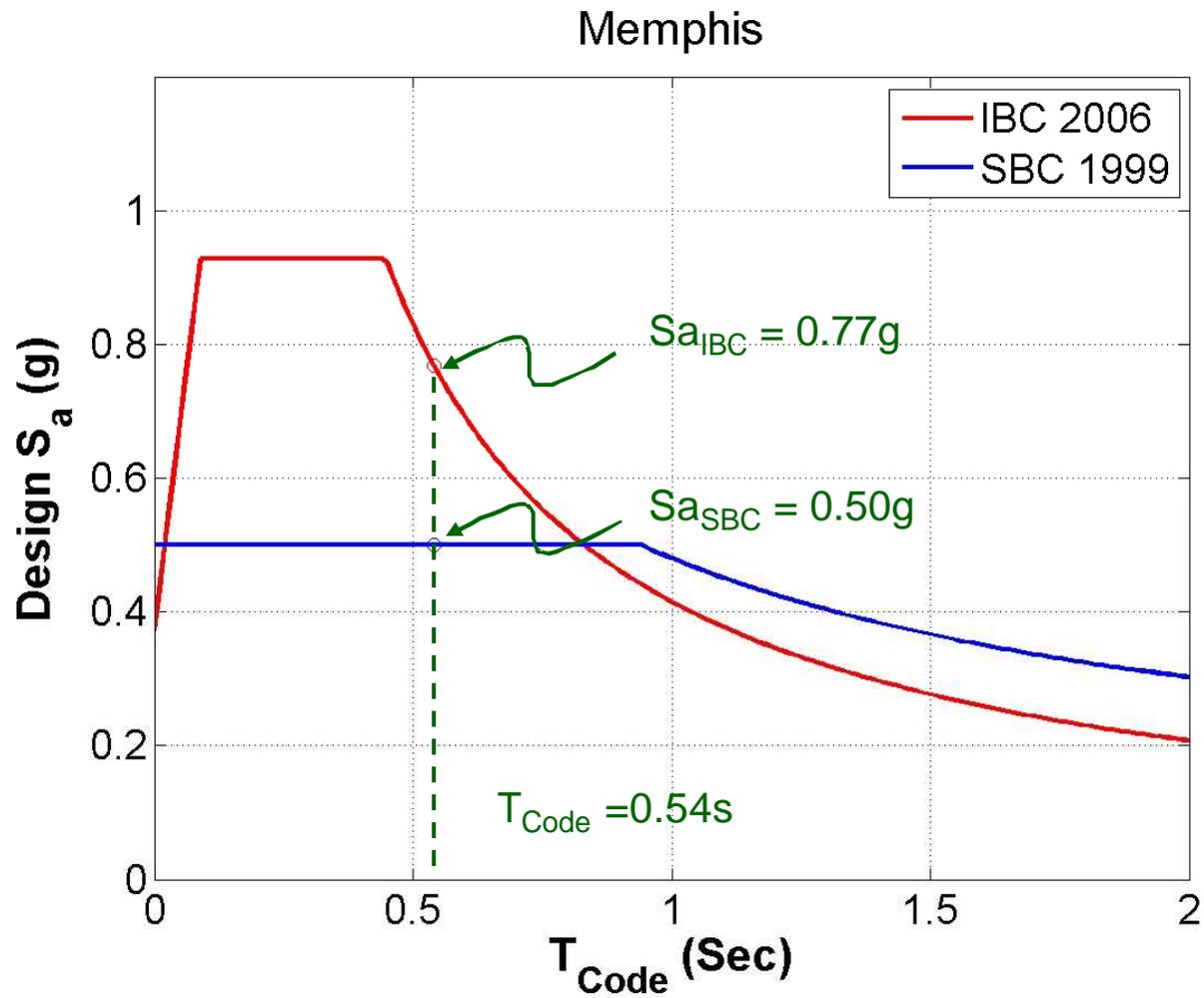


Damage State Definition

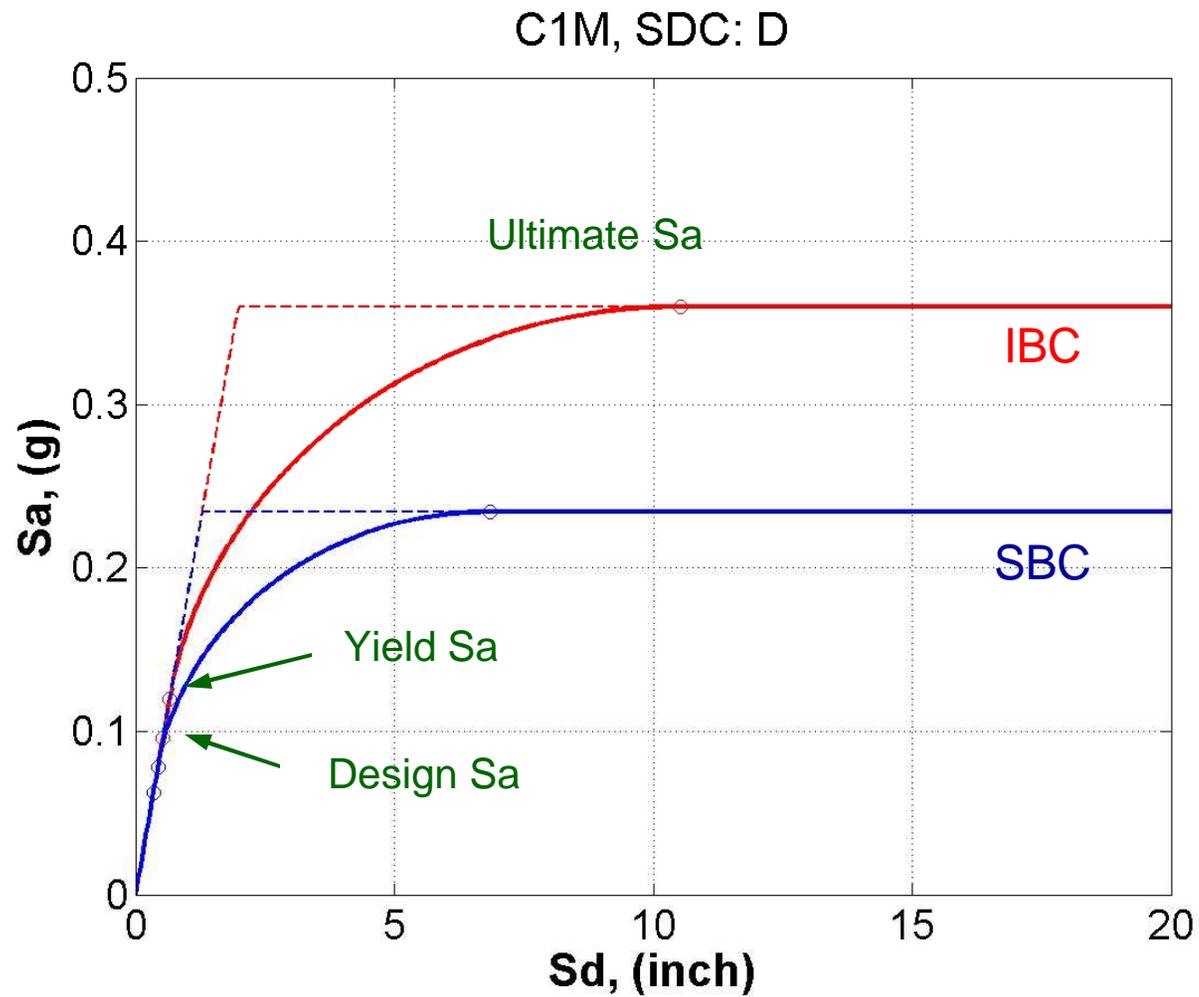


Design Spectra: SBC vs IBC

(Site Class D or Soil Type 4)

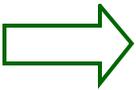
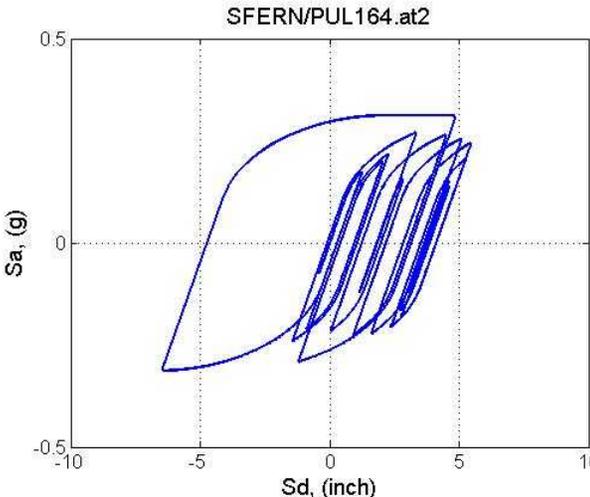
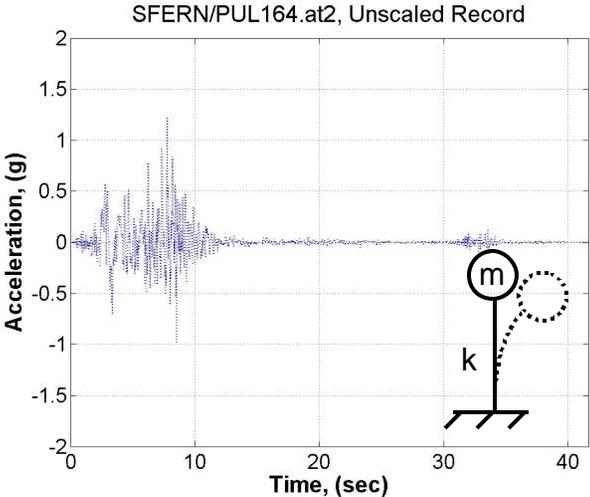


Capacity Curves: Mid-rise Concrete Building (C1M)

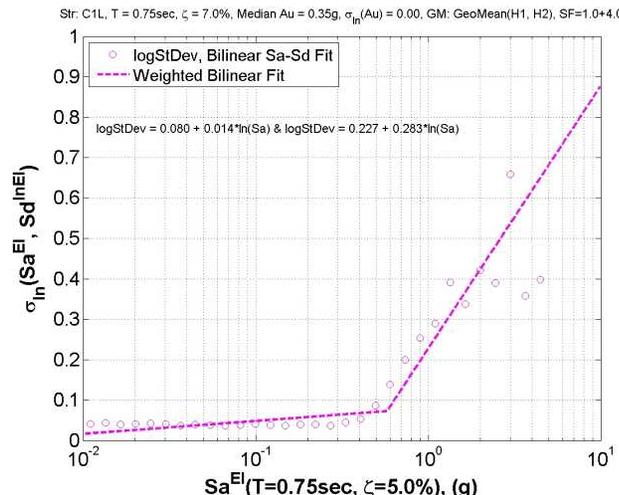
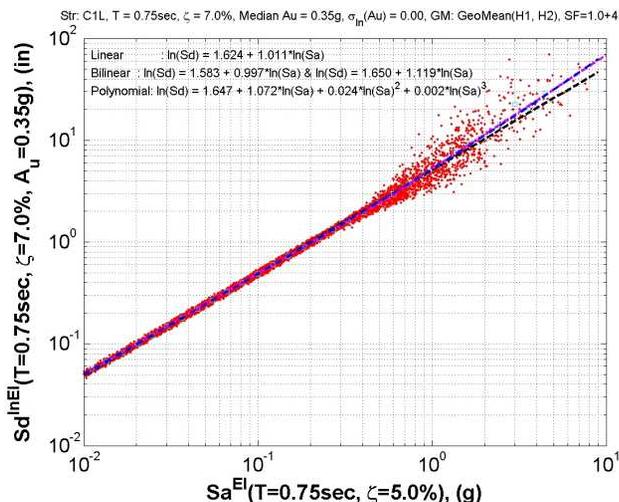


Building Response

Single Record

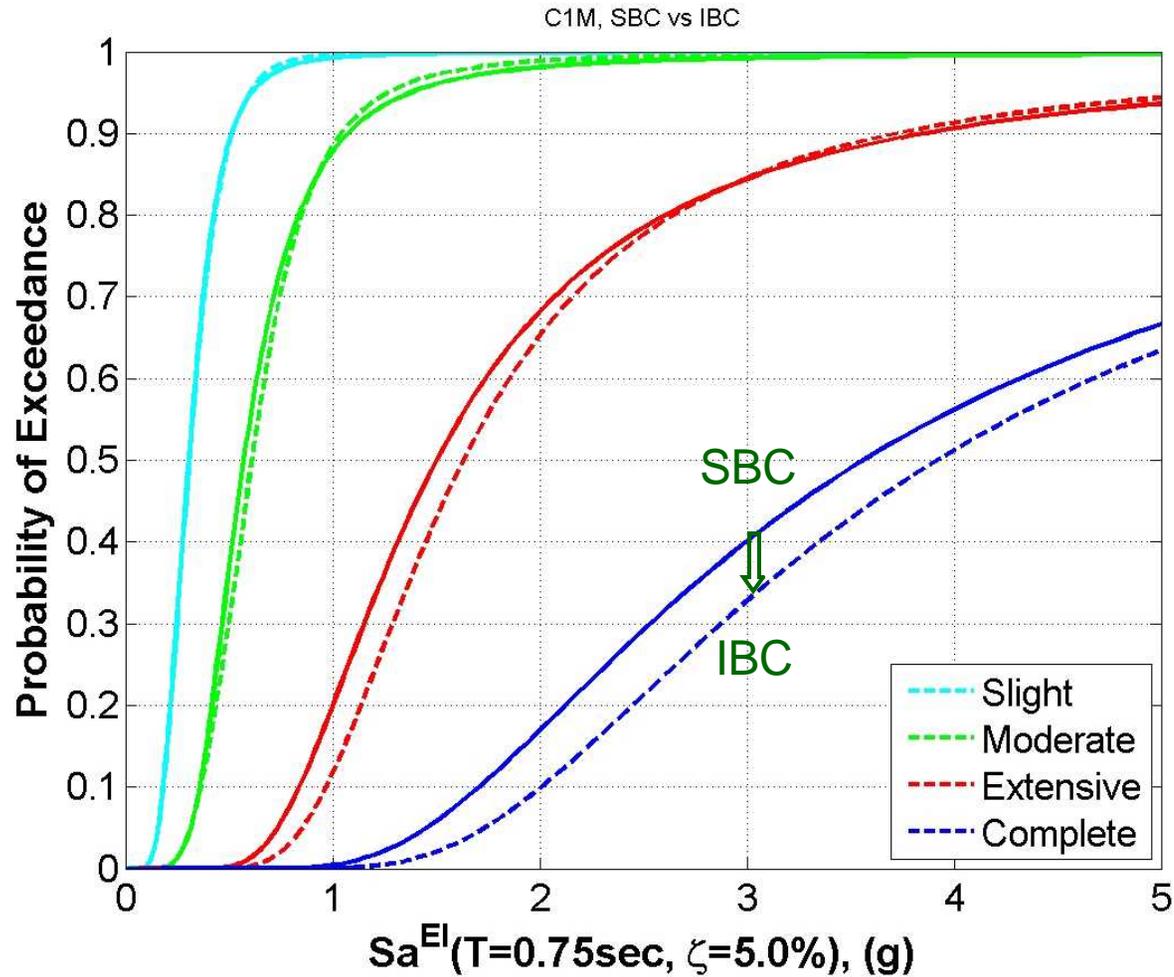


All Records



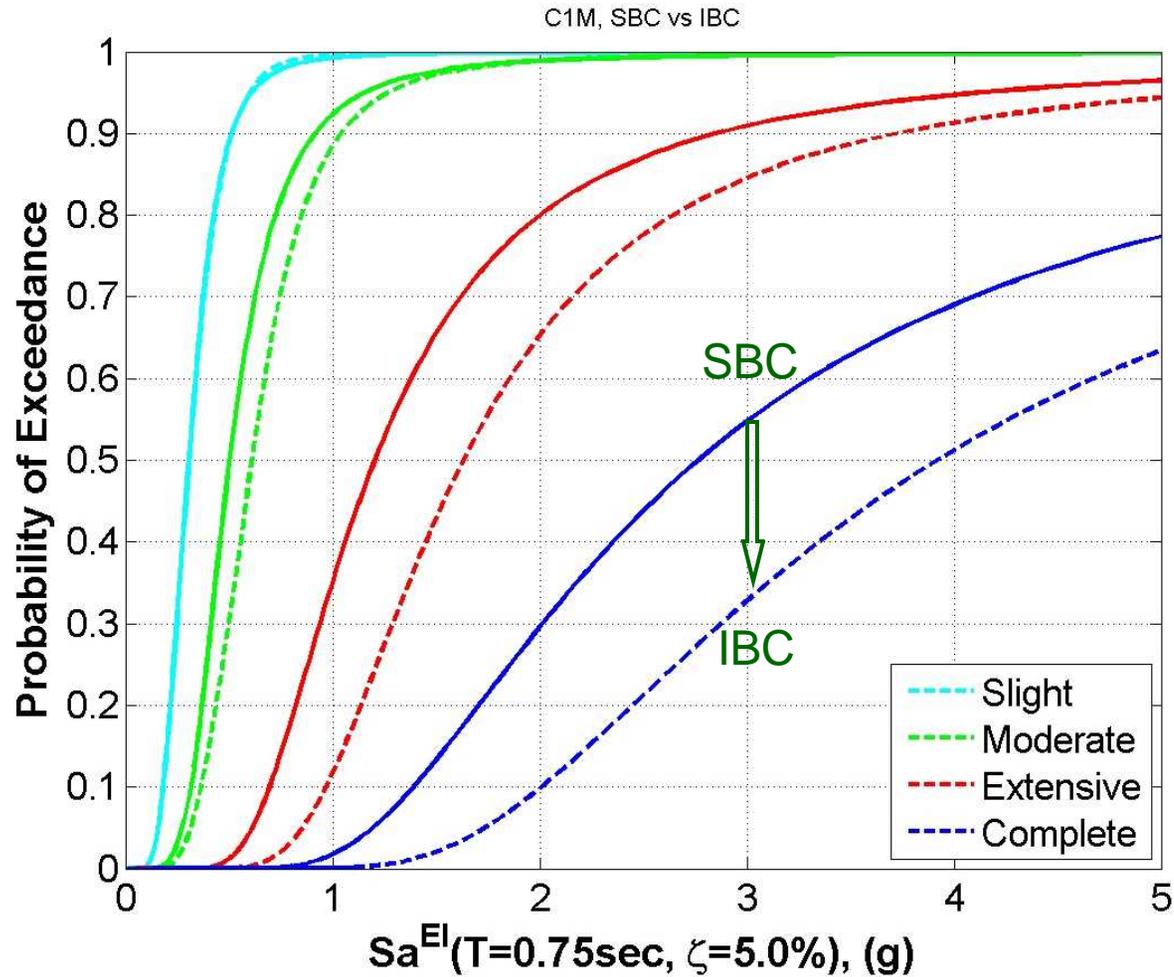
Fragility Curves

(SBC'99 SPC: **D** & IBC'03 SDC: **D**)



Fragility Curves

(SBC'99 SPC: **C** & IBC'03 SDC: **D**)

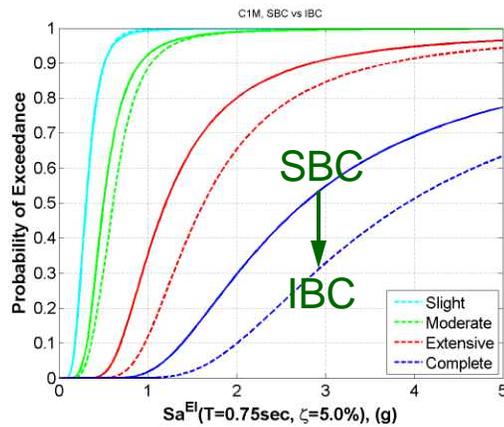
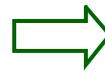
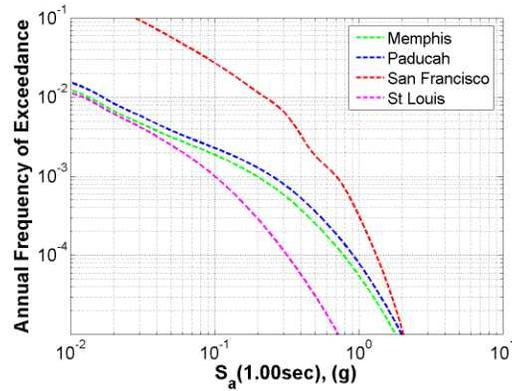


Current/Future Work

Inventory

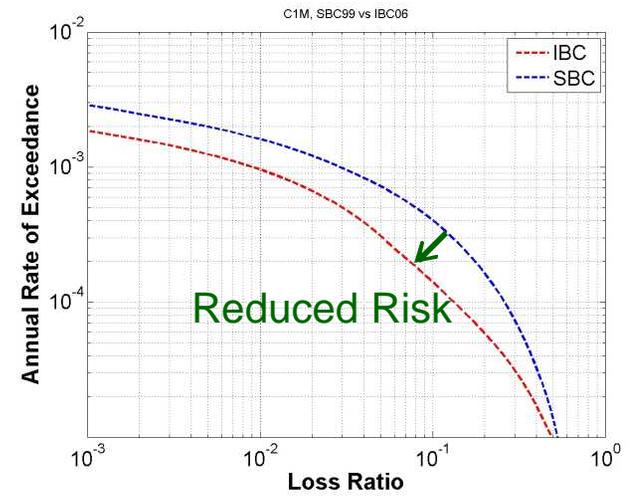


Hazard



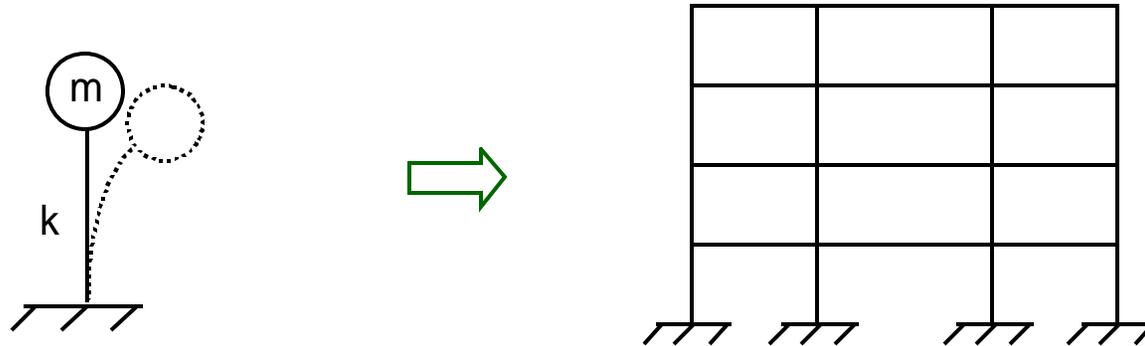
Vulnerability

Loss/Risk



Cost?

Future Work



Any suggestions
&
comments
are welcome!