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Estimation of Uncertainty in Hazard for IMW

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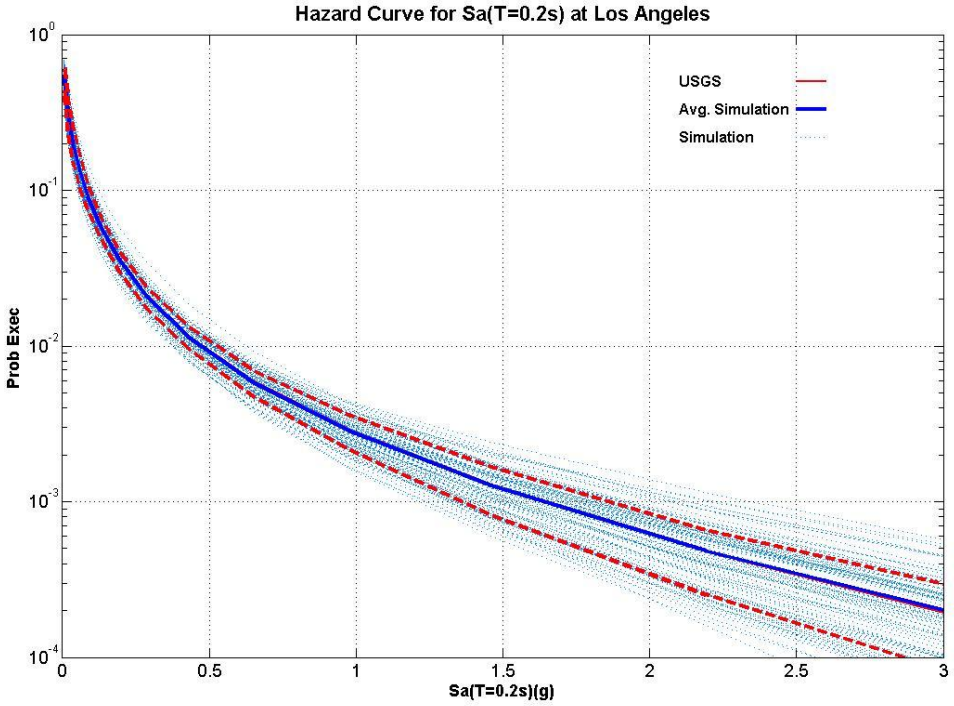
Risk Management Solutions

Objective

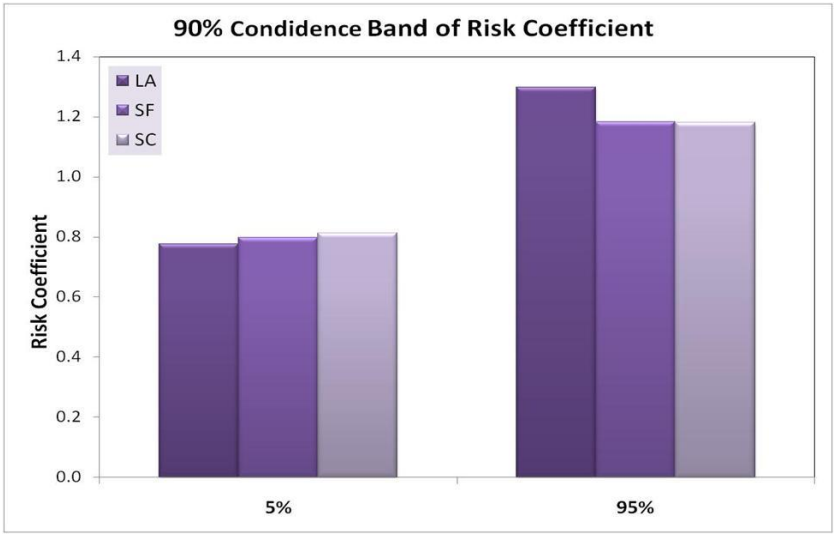
- Typically we estimate the mean hazard curve.
- In addition, we plan to estimate the epistemic uncertainty in the hazard.



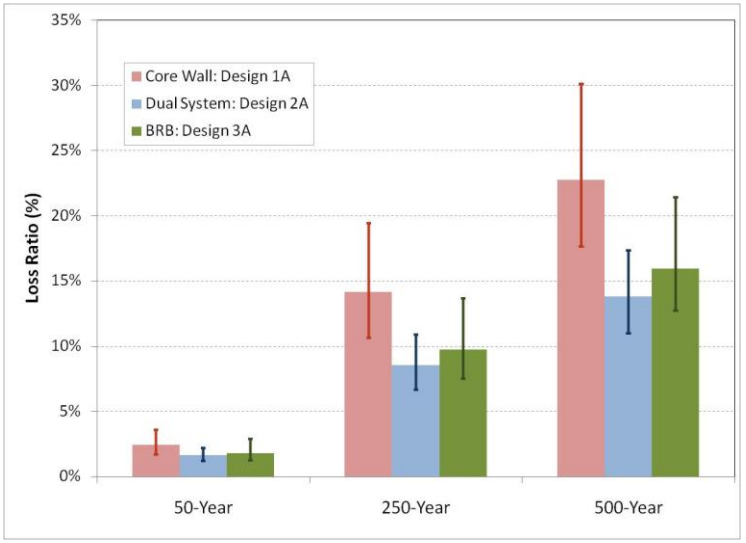
Importance of Estimating Uncertainty in Hazard

- Improve the decision making process from building design to insurance rate.

Risk coefficient for building design

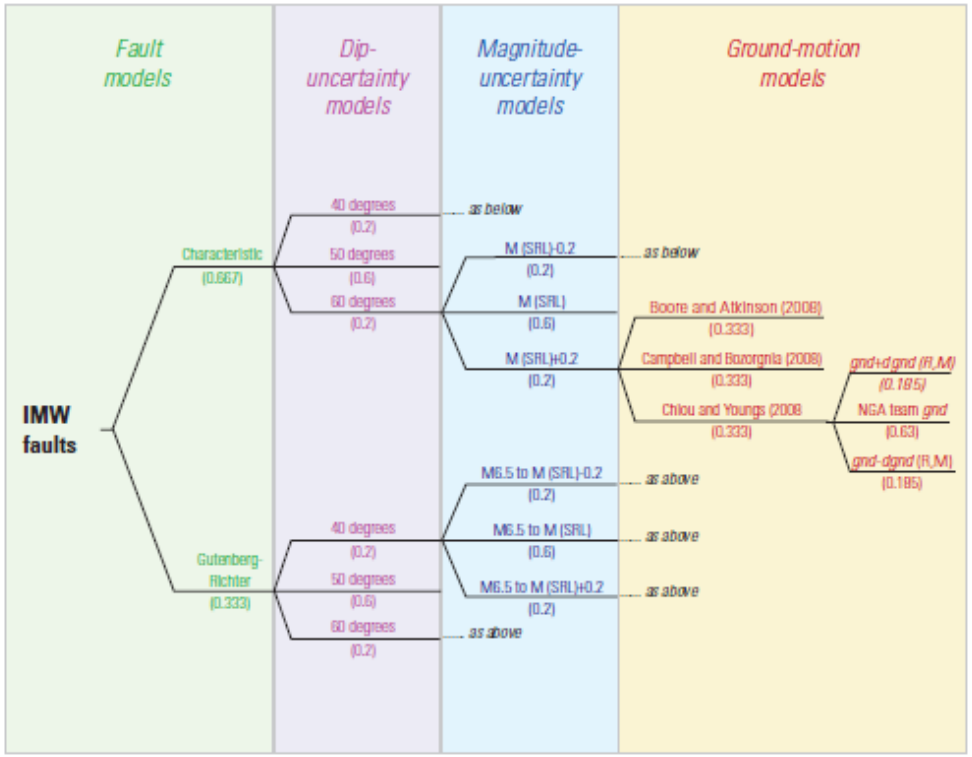


Loss estimation for PEER tall building design guideline



Logic-Tree Branch

- Although some of the logic-tree branches may not be important for mean-hazard calculations, those can be important in uncertainty calculations.



Uncertainty in Fault Model

- Fault location ??
- Fault Geometry
  - Proposed 50±15 dip
  - Length and width of fault ??
- Faulting style ??

Uncertainty in Magnitude and Magnitude-Area Relationship

- Magnitude uncertainty: ±0.2
- Magnitude area relationship
  - Wells and Coppersmith
  - Sterling and Others

Uncertainty in Recurrence

- Mean recurrence rate??
- Slip rate ??
- Recurrence model: time-independent and time-dependent model ??
- Time-dependent model: uncertainty in aperiodicity ??

Focusing on Parameters Having High Influence on the Hazard

90% Confidence Band of Sa at 2500-Year RP in LA: UCERF2

FM: Fault Model
DM: Deformation Model
ERM: EQ Rate Model
GM: Ground-Motion Model