NGA-East SSHAC Workshop 3C
Source depth, model centering

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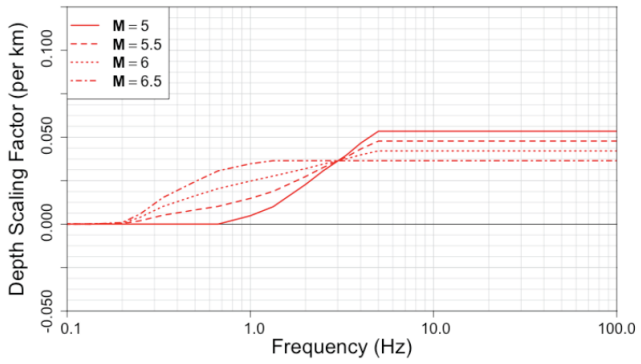
http://peer.berkeley.edu/ngaeast/

Source-depth effect weight

- No evidence that ground motions do not depend on source-depth: wt=100 %



Model centering?

- Small **M** events can be deeper that large **M** events
- Current model needs to be centered at reasonable (**M**-dependent) depth
- Models considered:
  - NGA-West2 (CY14 model)
  - CEUS SSC-based model

NGA-West2 (CY14)

$$\Delta Z_{TORi} = Z_{TORi} - E\left[Z_{TOR}\right]$$

- DeltaZ_{TORi} :depth-effect scaling (in 2 slides)
- $E[Z_{TOR}]$: $Z_{TOR}=f(\mathbf{M})$
- Z_{TORi} : source Z_{TOR}

CEUS SSC-based model (Youngs)

- $Z_{TOR}=f(\mathbf{M})$
  - Assumed avg(Z_{HYPO}) of 10km
    - NGA-East flatfile average: 12km; mode of distribution in NUREG-2115: 8km
  - Avg dip angle for CENA events: 75 deg. for strike-slip and 45 deg. for reverse (Table 5.4-1, NUREG-2115)
  - Down-dip hypocenter location based on the distribution of the fractional depth from the top of rupture. The mean of this distribution is used and is 0.6375 for strike-slip and 0.628 for reverse.
  - Seismogenic thickness set at 17km (central branch of thickness logic tree in NUREG-2115).
  - **M**-A relationship from Somerville [2014].
  - Rupture aspect ration is assumed to be 1:1 (Table 5.4-1 of NUREG-2115).

$Z_{TOR}=f(\mathbf{M})$

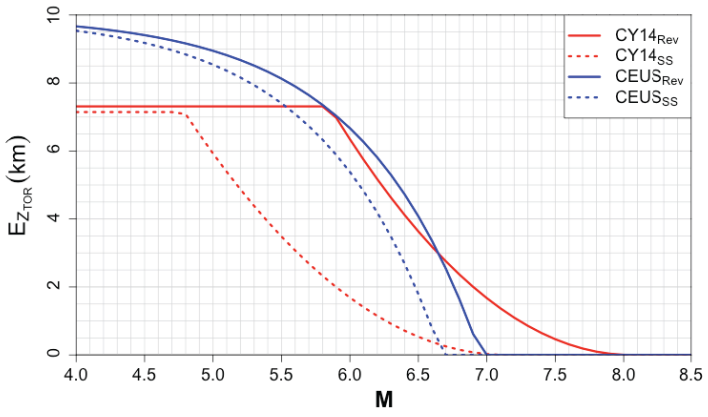


Figure 3.20 Expected values of Z_{TOR} from NGA-West2 (Chiou and Youngs [2014]) and for the CEUS region.

Proposal and notes

- Depth-effect model to get 100 weight
- Use average CEUS model (SS and Rev) of $E[Z_{TORi}]$ as depth-centering model
- Cap adjustment at
  - 10 km (max effect)
  - 0 km for **M**<5