

EPRI (2004, 2006) GMM Review Project Rationale for TI Team Recommendation Regarding Phase 2

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EPRI (2004) GMM

Cluster	Model Type	Models
1	Single Corner Stochastic (0.275/0.351)	Hwang and Huo (1997) Silva et al (2002) SC CS Silva et al (2002) - SC-CS-Sat Silva et al (2002) - SC-VS Toro et al (1997) Frankel et al (1996)
2	Double Corner Stochastic (0.312/0.399)	Atkinson and Boore (1995) Silva et al (2002) DC Silva et al (2002) DC - Sat
3	Hybrid (0.196/0.250)	Abrahamson & Silva (2002) Atkinson (2001) & Sadigh et al (1997) Campbell (2003)
4	Finite Source /Greens Function (0.217/0.000)	Somerville et al. (2001)

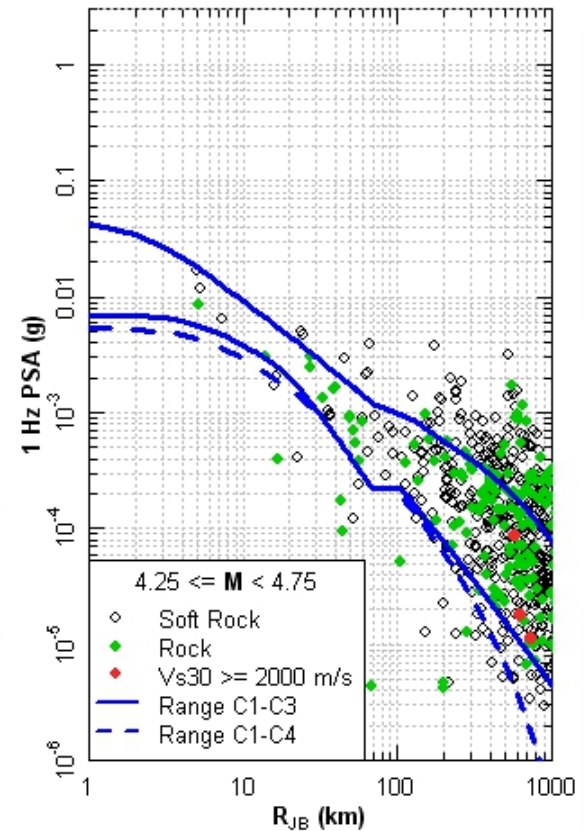
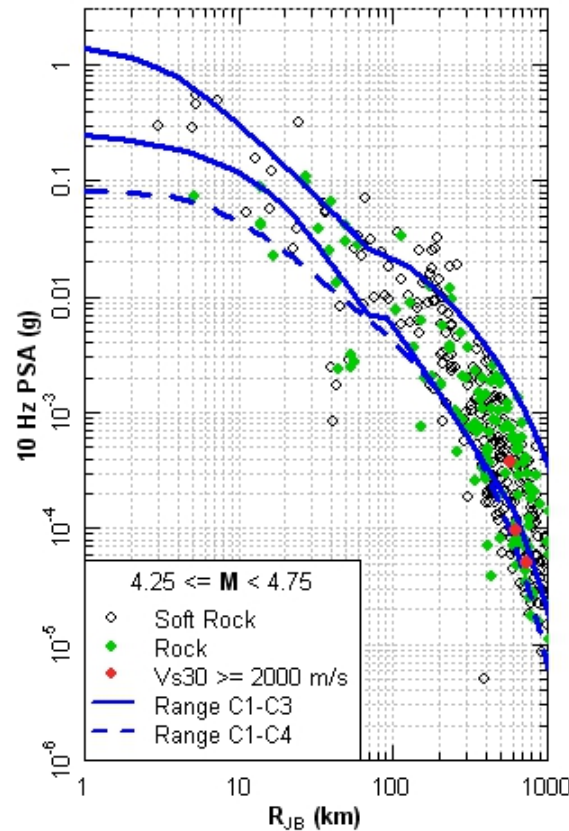
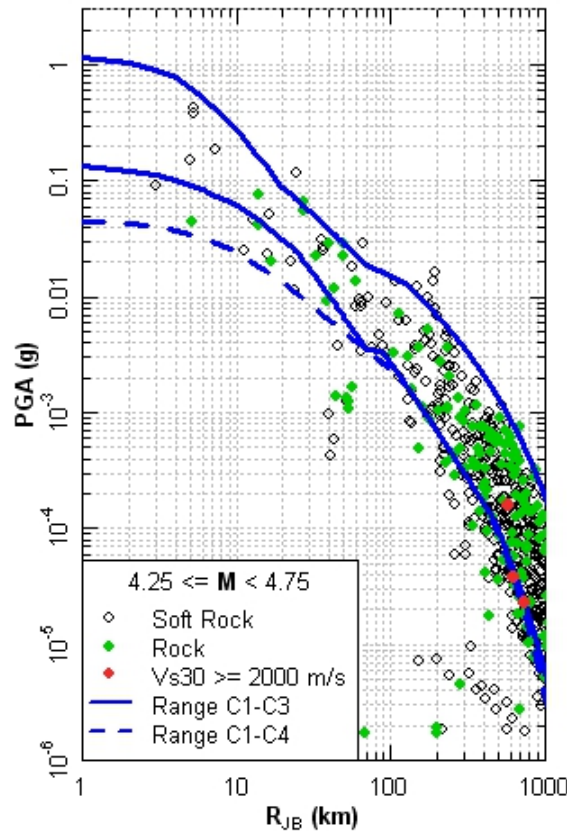
New Candidate Models

- Atkinson-Boore (2006, with 2011 revisions: ABo8')
 - Replaces Atkinson-Boore 2-corner
 - Recommended by Atkinson and Boore
- Atkinson (2008, with 2011 revisions; Ao8')
 - Candidate for Hybrid Cluster, recommended by Atkinson
- Pezeshk et al. (2011)
 - Candidate for for Hybrid Cluster, recommended by Campbell and Pezesch
- Silva et al. (2003):
 - nearly identical to Silva et al. (2002); treat as equivalent

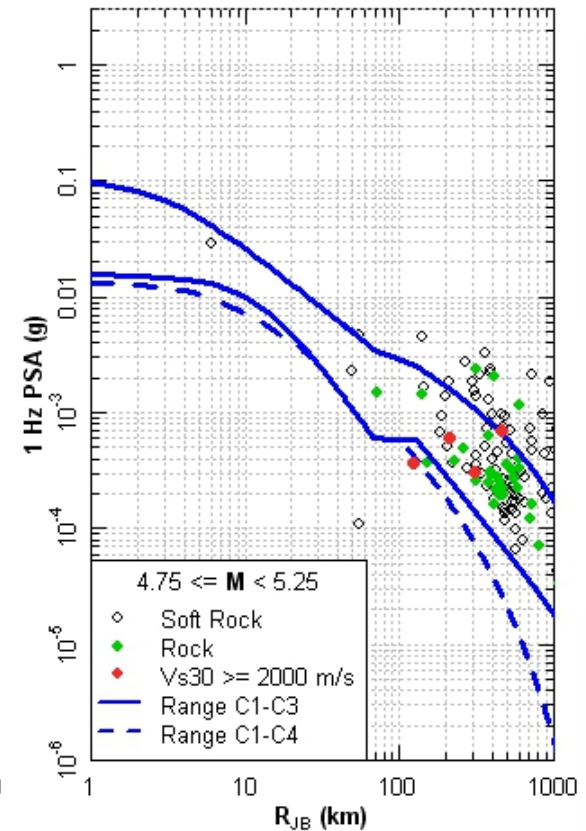
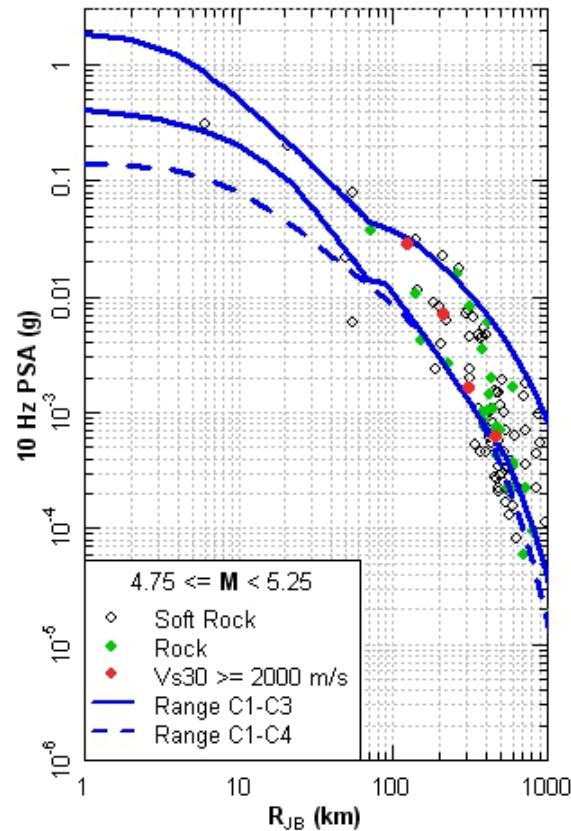
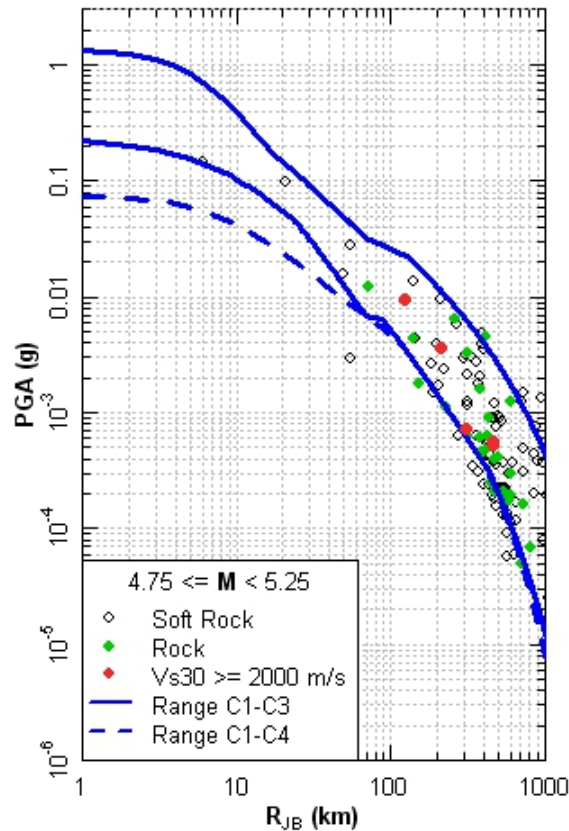
Comparisons to Data using NGA-East Database

- Comparisons to uncorrected ground-motion data for rock sites
 - 3 types: soft rock, rock, hard rock
 - Criteria: measured V_{s30} , inferred V_{s30} , geological description
- Comparisons to site-corrected ground-motion data
 - Sites with measured shear-wave velocity (this study, NGA-East, USGS)
 - Analytically derived corrections

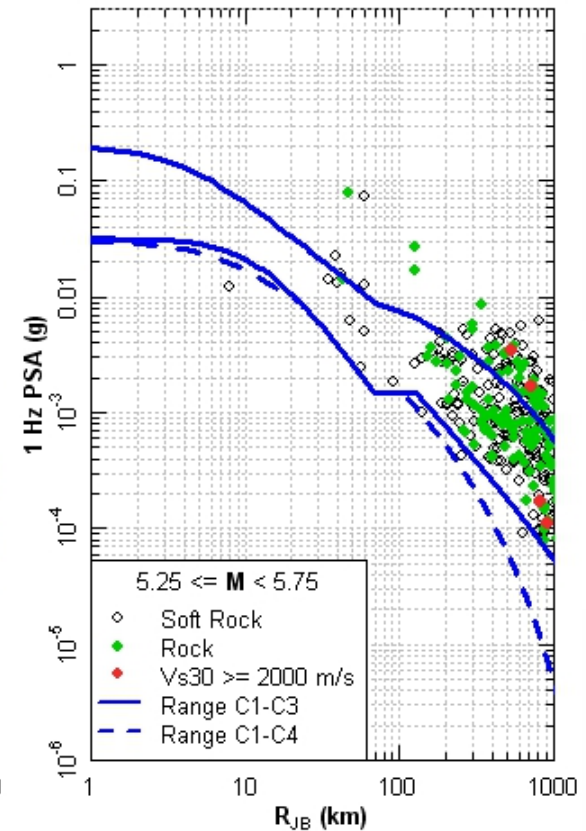
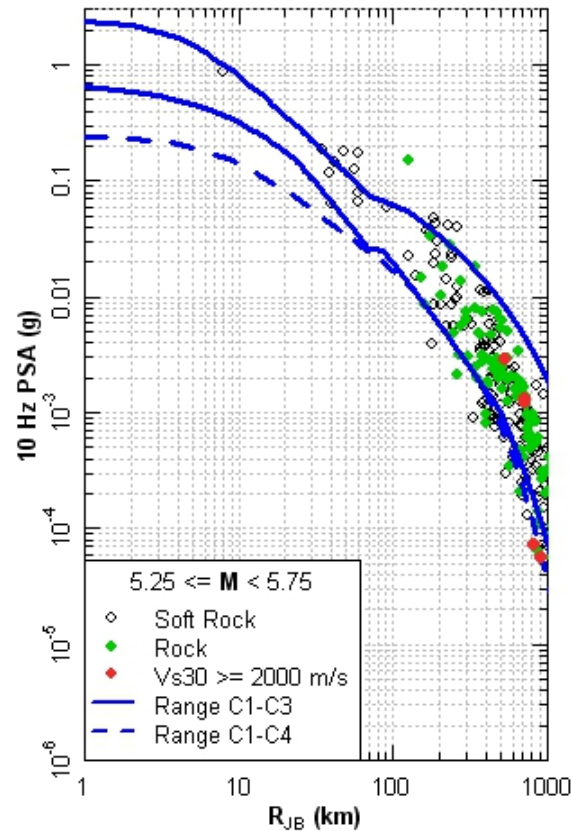
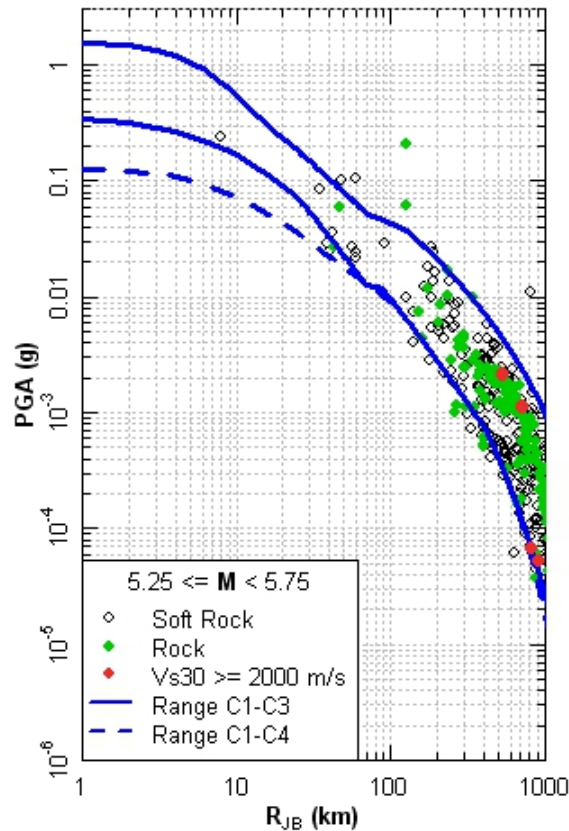
Range EPRI (2004), M 4.5



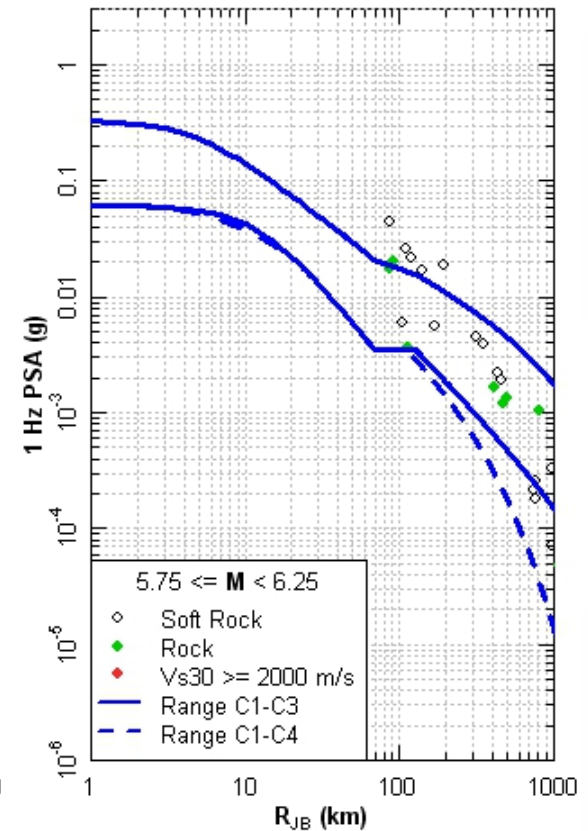
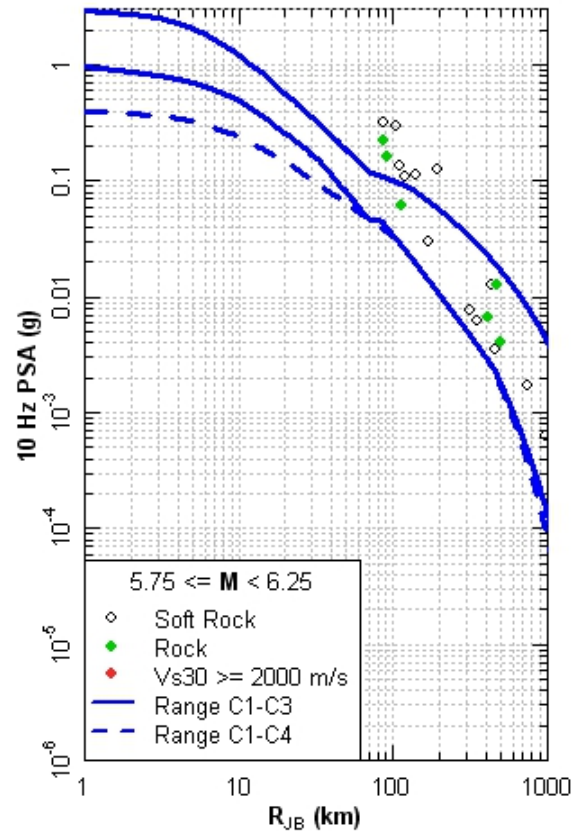
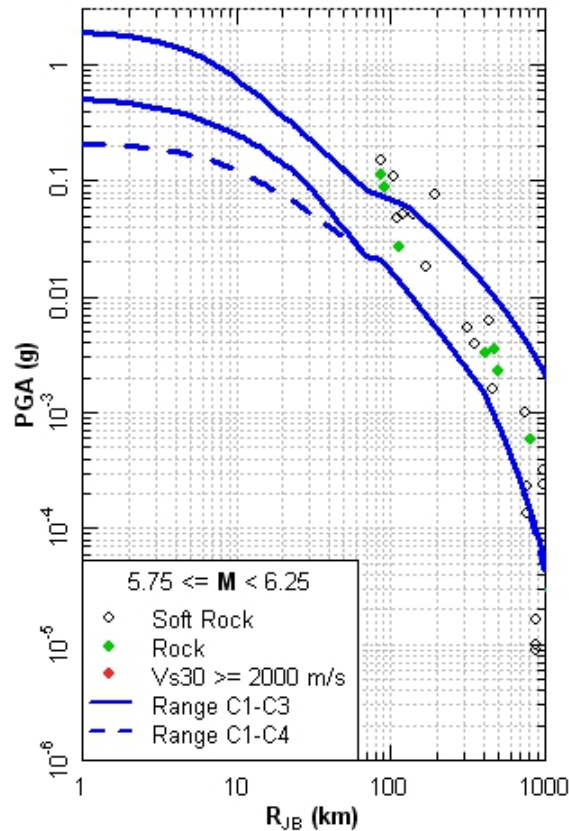
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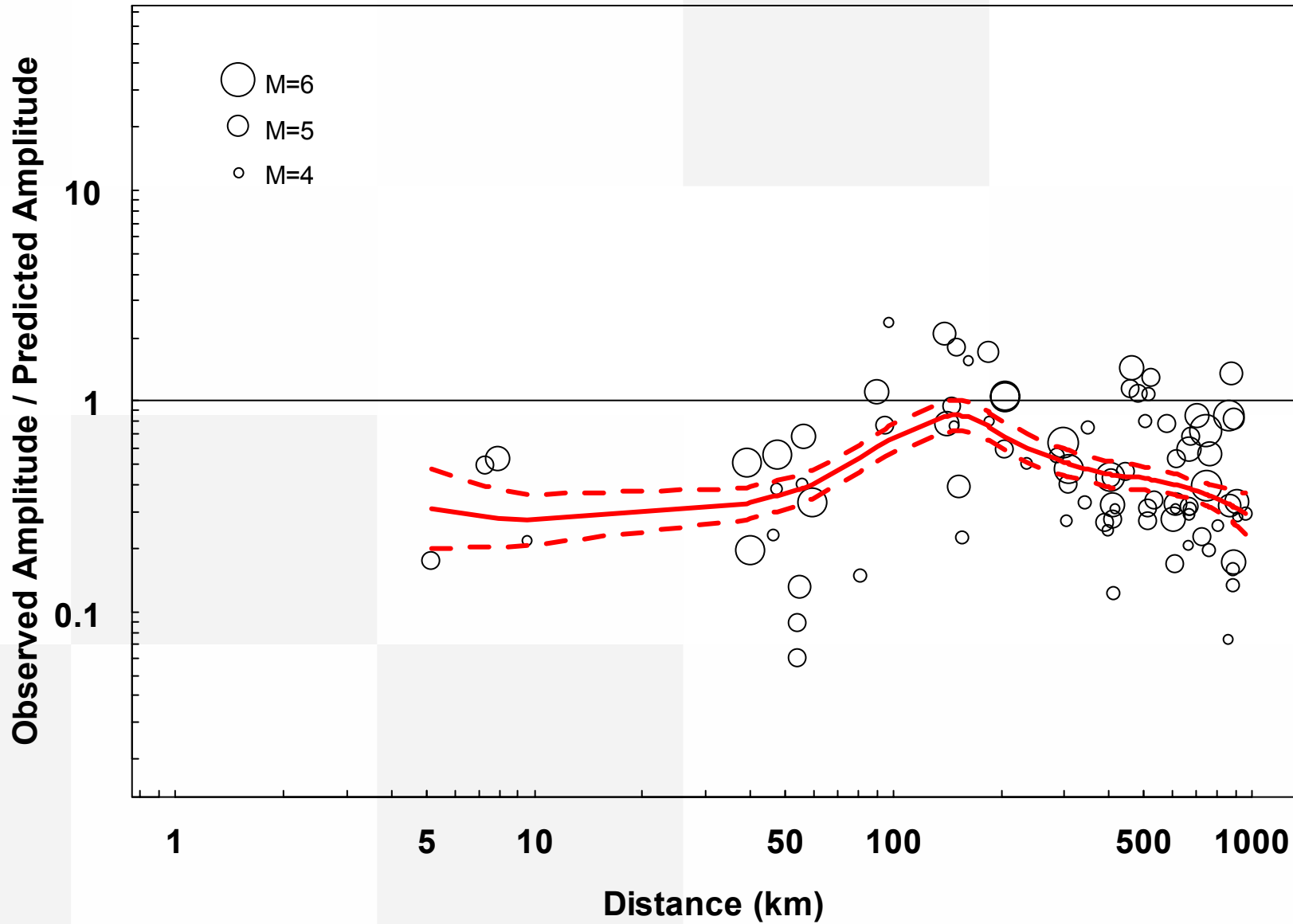
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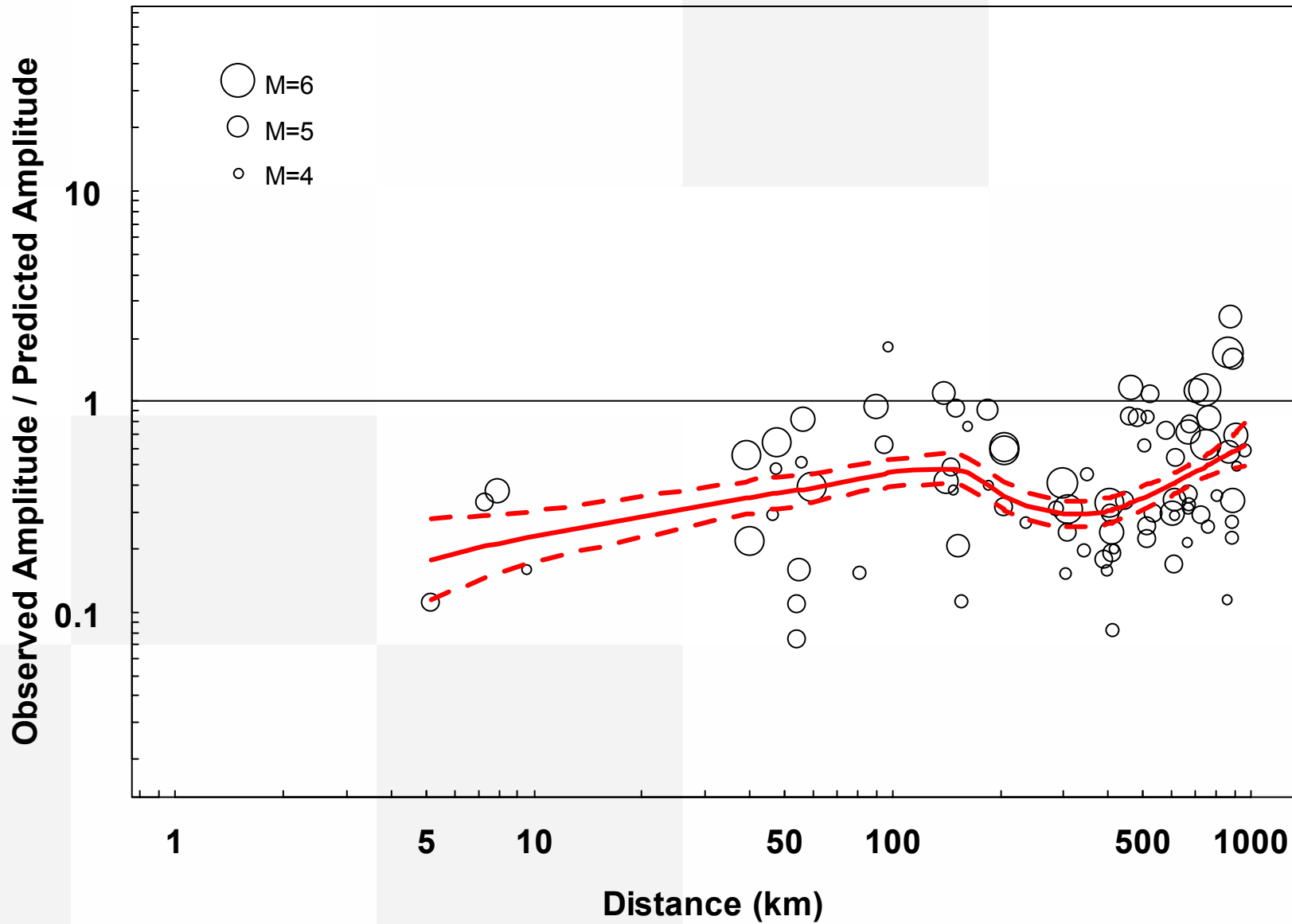
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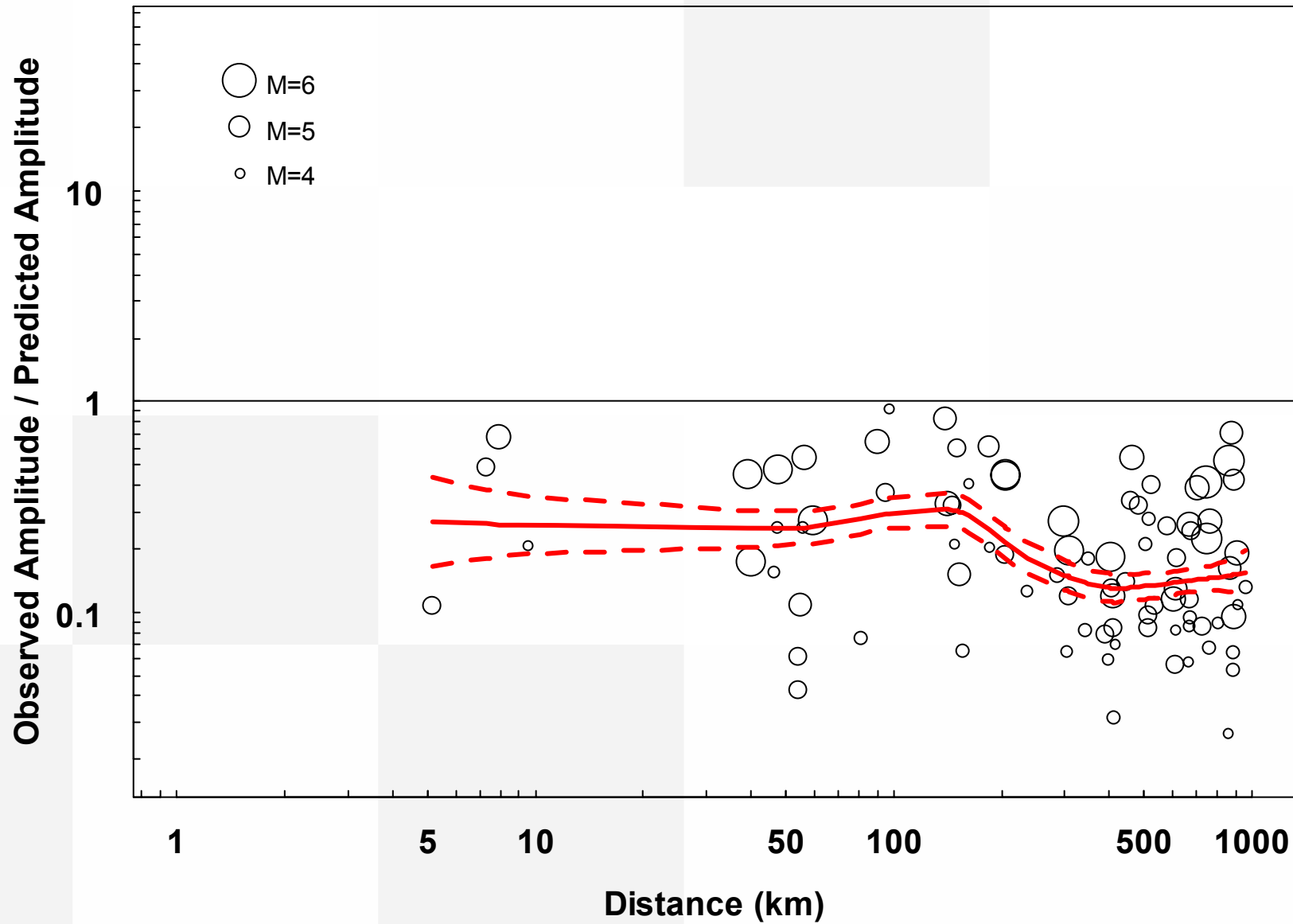
Corrected Residuals w.r.t. Cluster 1, 10 Hz



Corrected Residuals w.r.t. Cluster 2, 10 Hz



Corrected Residuals w.r.t. Cluster 3, 10 Hz



Summary:

Reasons for Updating EPRI 2004

- Proponents for 7 out of 13 GMPEs used in EPRI (2004) recommended that their GMPEs be replaced
- New GMPEs are available that are more consistent with current “data, models, and methods” and may be used for replacing the obsolete GMPEs
- Comparison of ground-motion data from NGA-East database (>> database available to EPRI, 2004) indicate significant discrepancies at magnitude-distance-frequency ranges important to NPP PSHA