Appendix A  Residual Figures

This appendix contains a larger set of residual figures. Between-event, between-site, and within-site residuals are shown for the following frequencies: 0.1, 0.15, 0.2, 0.3, 0.5, 0.8, 1, 1.5, 2, 3, 5, 8, 10, 15, 20, and 24 Hz.
A.1 BETWEEN-EVENT AND BETWEEN-SITE RESIDUALS

Figure A.1  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.1$ Hz.
Figure A.2  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.15$ Hz.
Figure A.3  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.2$ Hz.
Figure A.4  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.3$ Hz.
Figure A.5  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.5$ Hz.
Figure A.6  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 0.8$ Hz.
Figure A.7  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 1$ Hz.
Figure A.8 Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S 2S_s$) versus $V_{s30}$ for $f = 1.5$ Hz.
Figure A.9  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 2$ Hz.
Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S$) versus $V_{s30}$ for $f = 3$ Hz.

Figure A.10
Figure A.11 Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 5$ Hz.
Figure A.12  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$ for $f = 8$ Hz.
Figure A.13  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 10$ Hz.
Figure A.14  

Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 15$ Hz.
Figure A.15  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 20$ Hz.
Figure A.16  Between-event residuals ($\delta B_e$) versus $M$, $Z_{tor}$, and $F_{NM}$ and between-site residuals ($\delta S2S_s$) versus $V_{s30}$, for $f = 24$ Hz.
A.2 WITHIN-SITE RESIDUALS

Figure A.17  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.1$ Hz.
Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.15\ Hz$. 

Figure A.18
Figure A.19  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.2$ Hz.
Figure A.20 Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.3$ Hz.
Figure A.21  Within-site residuals ($\delta WS_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.5$ Hz.
Figure A.22  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 0.8$ Hz.
Figure A.23  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 1$ Hz.
Figure A.24  Within-site residuals ($\delta W_{e5}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 1.5$ Hz.
Figure A.25  Within-site residuals ($\delta W_{s_e}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 2$ Hz.
Figure A.26  Within-site residuals ($\delta WS_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 3$ Hz.
Figure A.27  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 5$ Hz.
Figure A.28  Within-site residuals ($\delta W_s$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 8$ Hz.
Figure A.29   Within-site residuals ($\delta WS_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 10$ Hz.
Figure A.30  Within-site residuals ($\delta WS_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 15$ Hz.
Figure A.31  Within-site residuals ($\delta W_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 20$ Hz.
Figure A.32  Within-site residuals ($\delta WS_{es}$) versus $M$, $R_{rup}$, $V_{s30}$, and $Z_1$ for $f = 24$ Hz.
A.3 WITHIN-SITE RESIDUALS BINNED BY M

Figure A.33 Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.1$ Hz.
Figure A.34  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.15$ Hz.
Figure A.35  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.2$ Hz.
Figure A.36  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.3$ Hz.
Figure A.37  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.5$ Hz.
Figure A.38  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 0.8$ Hz.
Figure A.39  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 1$ Hz.
Figure A.40  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 1.5$ Hz.
Figure A.41  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 2$ Hz.
Figure A.42  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 3$ Hz.
Figure A.43  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 5$ Hz.
Figure A.44  Within-site residuals ($\delta WS_{es}$) versus $R_{rup}$, binned by $M$, for $f = 8$ Hz.
Figure A.45  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 10$ Hz.
Figure A.46  Within-site residuals ($\delta W_{se}$) versus $R_{rup}$, binned by $M$, for $f = 15$ Hz.
Figure A.47  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 20$ Hz.
Figure A.48  Within-site residuals ($\delta W_{es}$) versus $R_{rup}$, binned by $M$, for $f = 24$ Hz.