Basin Reserve (BSRV)

Before utilizing the Vs profiles or the experimental dispersion data presented herein, it is strongly recommended that the user read and understand the document titled "Analysis Methodology", particularly the section titled "Limitation of Inversion Derived Vs Profiles", for a short discussion of the relevant limitations of the data presented.

Reference Location Basin Reserve (BSRV)

Figure 1: Site plan indicating locations of individual three-component, 20-s seismometers composing 2D arrays for Microtremor Array Measurements (MAM) and the linear array of 24, 4.5-Hz geophones used for Multichannel Analysis of Surface Waves (MASW) testing. MAM and MASW arrays are denoted in the legend by their largest extent/aperture.

Table 1: Latitude and longitude coordinates for MAM seismometer locations.

Station Identifier	Latitude (°)	Longitude (°)
BSVR_C50_11	-41.299737	174.780286
BSVR_C50_12	-41.299847	174.780068
BSVR_C50_14	-41.300176	174.780238
BSVR_C50_15	-41.300148	174.780497
BSVR_C50_16	-41.299988	174.780619
BSVR_C50_17	-41.299802	174.780523
BSVR_C50_18	-41.299962	174.780330
BSVR_C50_19	-41.300001	174.780281
BSVR_C50_20	-41.300069	174.780359
BSRV_C100_11	-41.299762	174.780355
BSRV_C100_12	-41.299906	174.779889
BSRV_C100_14	-41.300612	174.780098
BSRV_C100_15	-41.300593	174.780613
BSRV_C100_16	-41.300301	174.780930
BSRV_C100_17	-41.299923	174.780811
BSVR_C100_18	-41.300199	174.780344
BSRV_C100_19	-41.300941	174.779917
BSRV_C100_20	-41.300984	174.780536

Note: A .kmz with the location of each MAM seismometer is provided.

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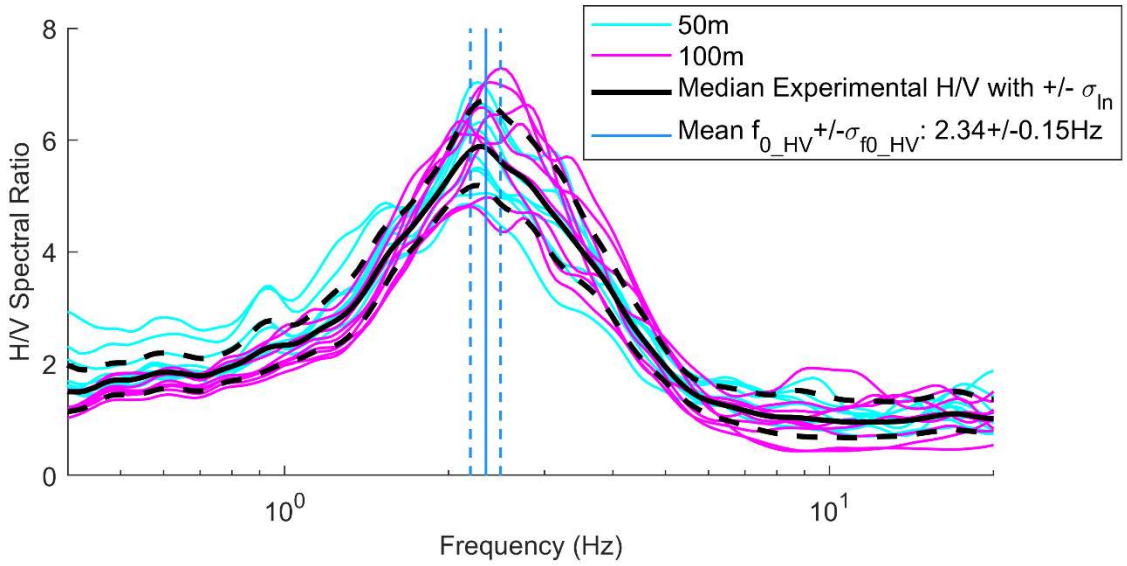

Figure 2: Horizontal-to-Vertical (H/V) Spectral Ratio curves derived from all single station seismometer recordings from the MAM arrays. The lognormal median experimental H/V curve with +/- one standard deviation curves determined from all single station measurements are shown. The fundamental frequency for the site is represented by the mean fundamental frequency peak ($f_{0\_H/V}$) calculated from all single station measurements and +/- one standard deviation ($\sigma_{f0\_H/V}$).

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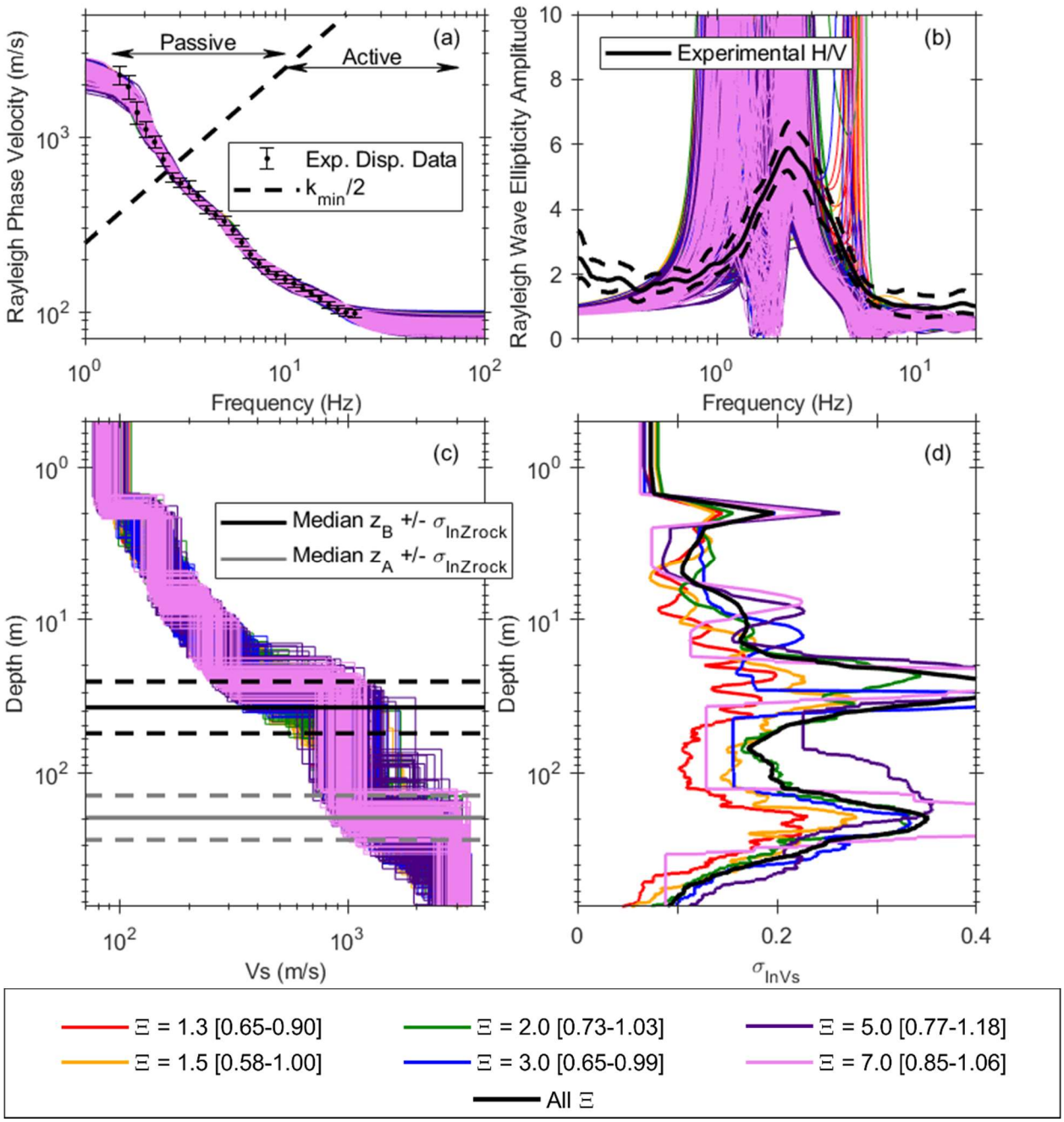

Figure 3: Inversion results. Shown for each layering ratio (Ξ) inversion parameterization are the 100 lowest misfit: (a) theoretical fundamental mode Rayleigh wave dispersion curves with the experimental dispersion data; (b) theoretical Rayleigh wave ellipticity with the lognormal median and +/- one standard deviation experimental H/V data; (c) shear wave velocity (Vs) profiles with the lognormal median depth to soft (Vs>760m/s) and hard (Vs>1500m/s) rock; and (d) standard deviation of the natural logarithm of Vs (σ_{lnVs}). The range of misfit values associated with the 100 lowest misfit velocity profiles for each Ξ inversion parameterization are shown in brackets in the figure's legend. Note the 1000 lowest misfit and statistical median Vs profiles for each Ξ inversion parameterization and reference location are provided in text format in the sub-directory Vs Profiles.

Table 2: Resolution depth (d_{res}) and maximum depth (d_{max}) for the Vs profiles as determined by the array geometry and experimental dispersion data. See document Analysis Methodology for details.

Resolution Depth (d_{res})	Maximum Depth (d_{max})
124m	750m

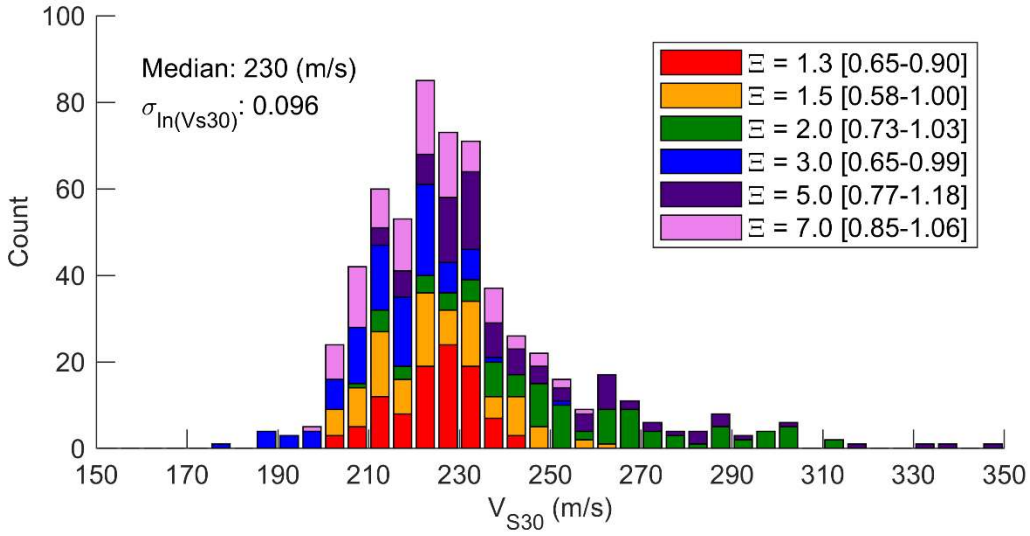

Figure 4: Distribution of the time averaged shear wave velocity in the upper thirty meters (Vs30) for the 100 lowest misfit velocity profiles from each layering ratio (Ξ) inversion parameterization. The lognormal median Vs30 value and corresponding standard deviation of the natural logarithm of Vs30 (σ_{lnVs30}) are provided in the figure.

Table 3: Experimental dispersion data in the form of the mean and standard deviation Rayleigh phase velocity discretized in terms of frequency. The approximate intersection of the theoretical array resolution limit ($k_{min}/2$) for the largest MAM array and the fundamental mode Rayleigh experimental dispersion data has been indicated with a dashed line. Dispersion data with frequencies below the dashed line are less certain and should be used with caution. See document Analysis Methodology for more information.

Frequency (Hz)	Rayleigh Phase Velocity (m/s)	Velocity Standard Deviation (m/s)
22	98	5
20	100	5
18	103	5
16	110	6
15	120	6
14	128	6
12	137	7
11	146	8

10	154	9
9.0	163	8
8.2	173	9
7.4	190	10
6.7	214	11
6.1	251	14
5.5	294	18
5.0	330	19
4.5	360	17
4.1	384	22
3.7	461	30
3.3	518	42
3.0	545	33
2.7	588	35
2.5	743	60
2.2	936	77
2.0	1103	116
1.8	1380	204
1.6	1933	294
1.5	2254	262

Table 4: Lognormal median depth to the National Earthquake Hazards Reduction Program (NEHRP) Site Class B ("soft rock" = 760 m/s) and Site Class A ("hard rock" = 1500 m/s) boundaries determined from surface wave inversion Vs profiles.

	Lognormal Median (m)	Lognormal Standard Deviation (#)
BC Boundary	38	0.39
AB Boundary	197	0.33