

Log Yard (LY)

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 Log Yard (LY)

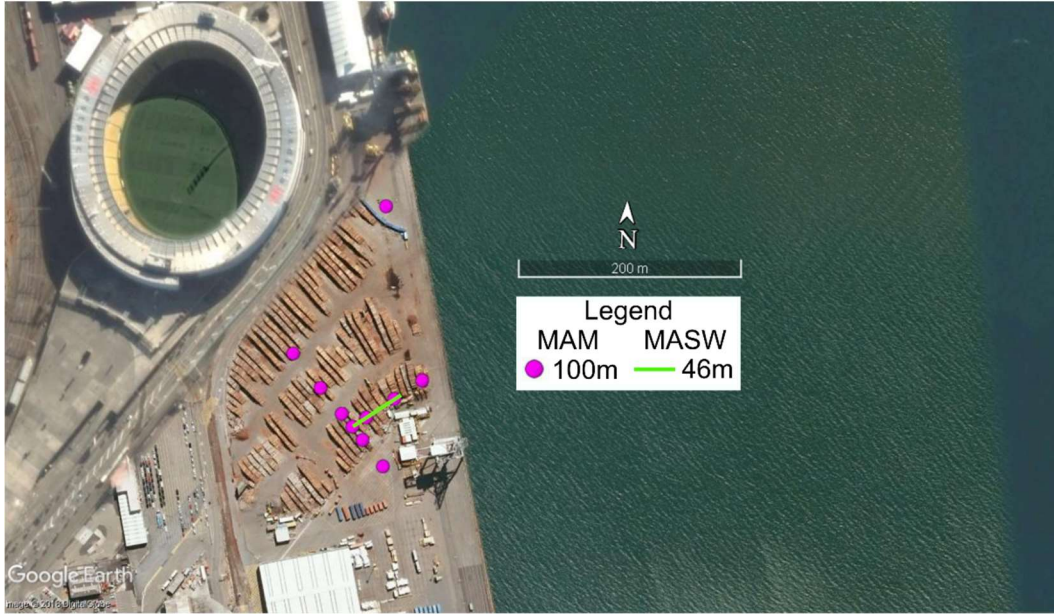


Figure 1: Site plan indicating locations of individual three-component, 20-s seismometers composing the 2D array for Microtremor Array Measurements (MAM) and the linear array of 24, 4.5-Hz geophones used for Multichannel Analysis of Surface Waves (MASW) testing. MAM and MASW arrays are denoted in the legend by their largest extent/aperture. Note station 20, located in the southwest corner of the port, is not shown in Figure 1.

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

Station Identifier	Latitude (°)	Longitude (°)
LY_T11	-41.274850	174.788404
LY_T12	-41.275005	174.788109
LY_T13	-41.275159	174.787815
LY_T14	-41.275236	174.787668
LY_T15	-41.273457	174.787971
LY_T16	-41.275341	174.787781
LY_T17	-41.275550	174.788006
LY_T18	-41.275135	174.787551
LY_T19	-41.274931	174.787317
LY_T20	-41.274659	174.787015

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

Reference Location Log Yard (LY)

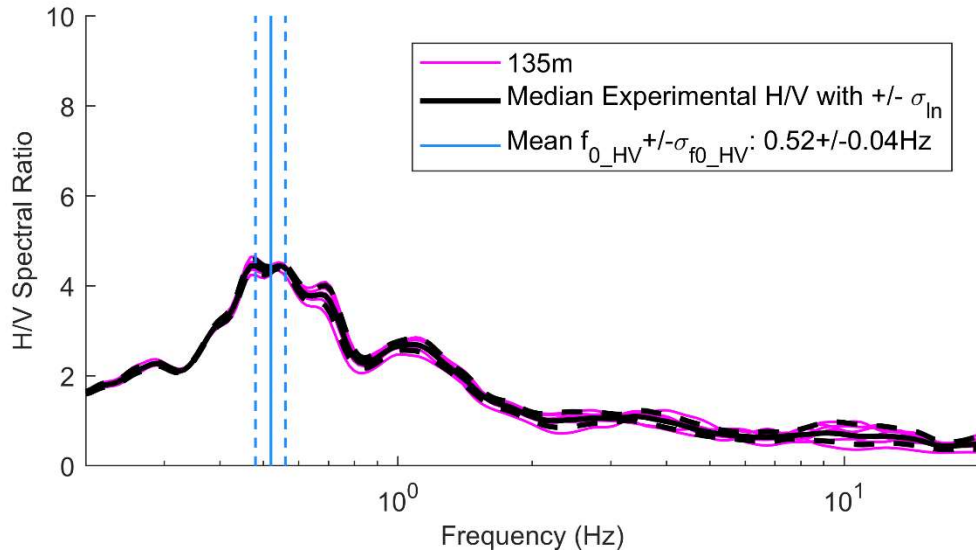


Figure 2: Horizontal-to-Vertical (H/V) Spectral Ratio curves derived from all single station seismometer recordings from the MAM array. The lognormal median experimental H/V curve with \pm one standard deviation curves determined from all single station measurements are shown. The fundamental frequency for the site is represented by the mean fundamental frequency peak ($f_{0_H/V}$) calculated from all single station measurements and \pm one standard deviation ($\sigma_{f0_H/V}$).

Reference Location Log Yard (LY)

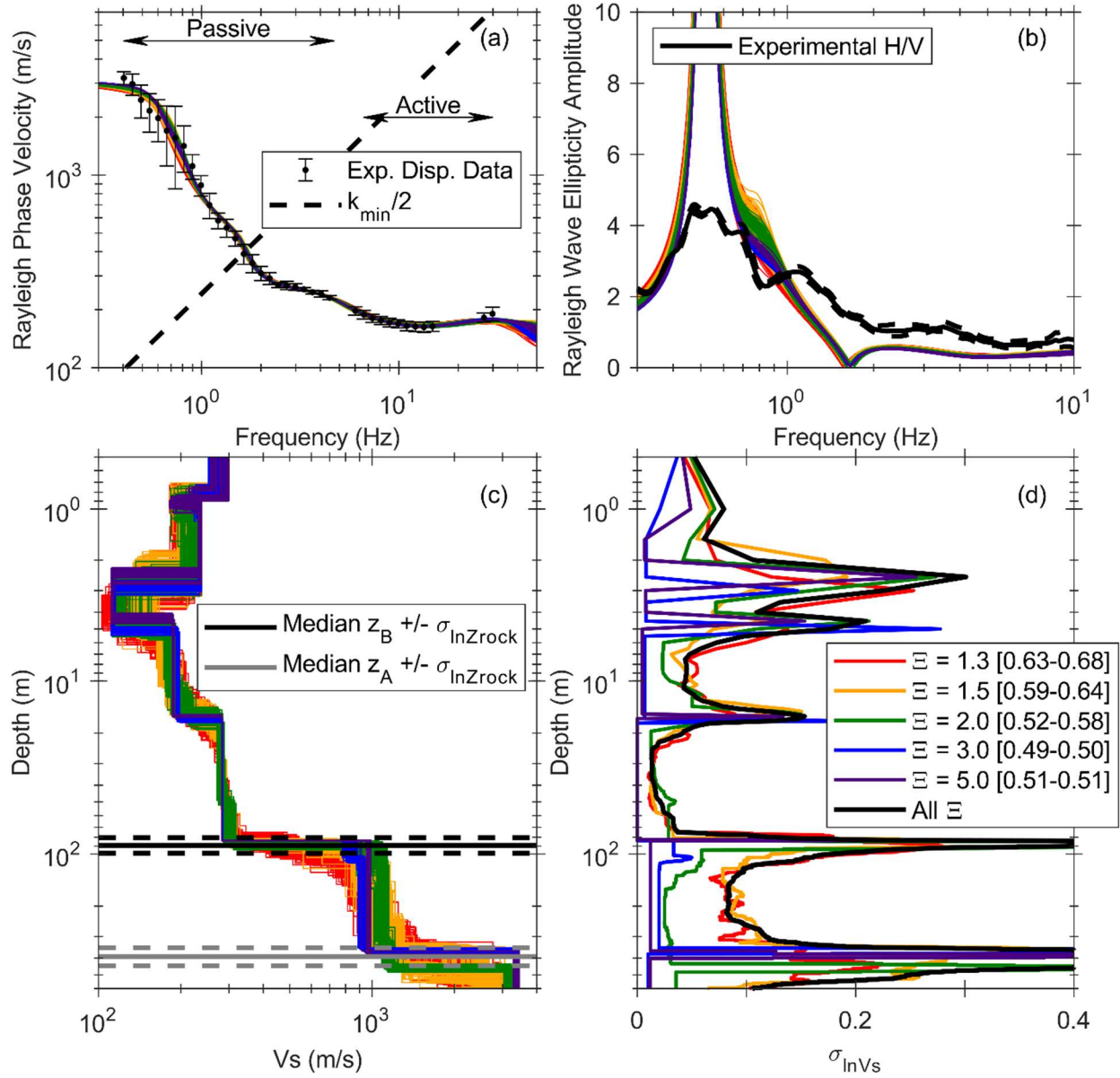


Figure 3: Inversion results. Shown for each layering ratio (Ξ) inversion parameterization are the 100 lowest misfit: (a) theoretical fundamental mode Rayleigh wave dispersion curves with the experimental dispersion data; (b) theoretical Rayleigh wave ellipticity with the lognormal median and \pm one standard deviation experimental H/V data; (c) shear wave velocity (V_s) profiles with the lognormal median depth to soft ($V_s > 760 \text{ m/s}$) and hard ($V_s > 1500 \text{ m/s}$) rock; and (d) standard deviation of the natural logarithm of V_s ($\sigma_{\ln V_s}$). 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 V_s profiles for each Ξ inversion parameterization and reference location are provided in text format in the sub-directory V_s Profiles.

Reference Location Log Yard (LY)

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. Even though the experimental dispersion data for this reference location was combined with data from the BIG array prior to inversion, d_{res} and d_{max} have been solely based on the reference location array and data extracted therefrom.

Resolution Depth (d_{res})	Maximum Depth (d_{max})
121m	600m

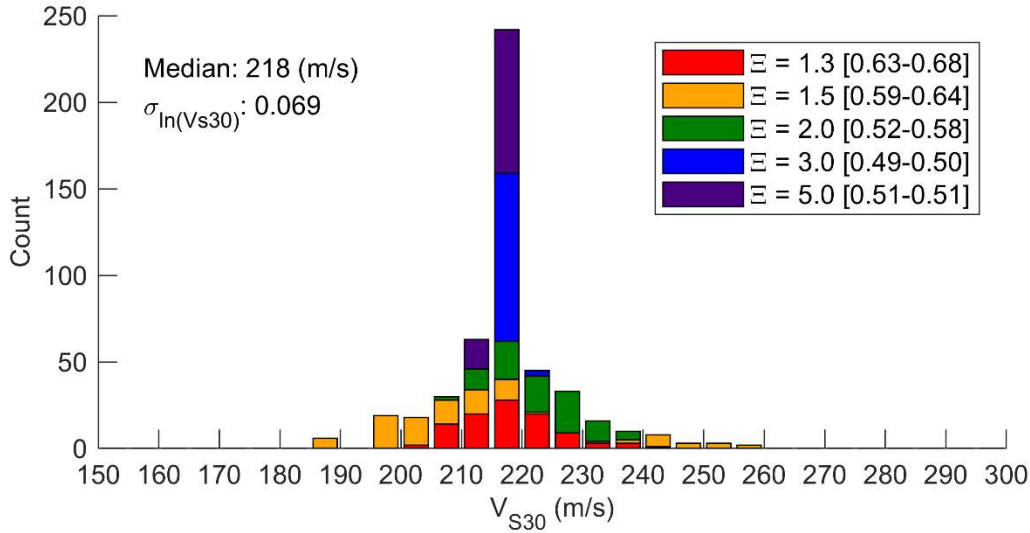


Figure 4: Distribution of the time averaged shear wave velocity in the upper thirty meters (V_{s30}) for the 100 lowest misfit velocity profiles from each layering ratio (Ξ) inversion parameterization. The lognormal median V_{s30} value and corresponding standard deviation of the natural logarithm of V_{s30} ($\sigma_{\ln V_{s30}}$) 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 ($k_{\text{min}}/2$) 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)
30	191	16
27	182	10
15	164	10
13	162	10
12	164	9
11	165	9

Reference Location Log Yard (LY)

9.9	169	9
9.0	172	9
8.1	176	9
7.3	181	9
6.6	189	9
6.0	197	10
4.5	231	6
4.0	242	9
3.6	247	5
3.3	255	6
3.0	262	11
2.7	268	13
2.4	268	7
2.2	291	21
2.0	309	26
1.8	349	38
1.6	390	46
1.5	468	42
1.3	532	56
1.2	580	54
1.1	698	105
0.99	884	107
0.90	1114	163
0.81	1417	386
0.73	1559	713
0.66	1699	585
0.60	1975	488
0.54	2156	489
0.49	2454	475
0.45	2971	379
0.40	3192	246

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	89	0.10
AB Boundary	392	0.12