

Supporting Material for:

Data for: Sparse Ambient Resonance Measurements Reveal Dynamic Properties of Freestanding Rock Arches

Geimer PR, Finnegan R, and Moore JR

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1. *Musselman Arch*

32 nodal geophones were deployed across Musselman Arch (38.4358°N, 109.7701°W), with the array consisting primarily of two lines (Lines A and B) deployed parallel to the orientation of the arch span (37° E of magnetic north), separated by 1 m, with an additional two stations in Line C positioned 2 m beyond Line B. A tape measure aligned with the arch allowed for relative locating of the stations in each line.

Stations were positioned at roughly 5-m intervals along each line, with station names, line names, and exact linear position given in Table 1.



Figure 1. Musselman Arch nodal array geometry. Station names are shown with lines indicated by color: red-A, orange-B, green-C. Blue polygon outlines the arch span.

Table 1. Musselman Arch array station names and positions.

<i>Line A</i>		<i>Line B</i>		<i>Line C</i>	
Name	Position	Name	Position	Name	Position
301	-10.05	-	-	-	-
101	-5.10	-	-	-	-
000	0.20	200	0.10	-	-
001	4.95	201	5.00	-	-
002	10.00	202	10.00	-	-
003	15.05	203	15.00	-	-
004	20.10	204	19.95	-	-
005	24.90	205	24.95	-	-
006	30.05	206	30.10	-	-
007	35.10	207	35.00	-	-
008	39.98	208	39.95	-	-
009	45.00	209	45.00	-	-
010	50.00	210	50.05	-	-
011	54.85	211	55.10	-	-
012	59.95	212	60.00	412	60.00
013	64.95	213	64.65	413	64.00

2. Measurement Metadata

Data included in Table 2 give site and measurement metadata for the seismic (MSEED + SAC) time-series recordings made at each study site, corresponding to the zipped folders included in the file repository. Several sites have truncated records or non-simultaneous recordings noted.

Table 2. Metadata for zipped repository seismic data.

Site	Station	Lat (°)	Lon (°)	Arch Orient (° from MN)	Date	Start (UTC)	End (UTC)	Sampling Rate (Hz)	Reference Station?	Air Temp (°C)	Rock Temp (°C)	Notes
Aqueduct Arch	AQUA	38.1372	-109.5165	65	2017-02-19	13:00	14:00	100	Y	3.1	5.0	
Arsenic Arch	ARS	38.1056	-110.5391	126	2019-01-19	22:00	23:00	200	Y	10.0	9.4	
Big Arrowhead Arch	BARH	37.7396	-110.2708	150	2018-07-09	19:40	20:40	200	Y	35.8	36.8	
Causeway Arch	CAUS	37.8319	-109.6248	70	2018-07-08	3:40	4:40	200	Y	18.6	22.7	
Corona Arch	COR	38.5799	-109.6200	158	2017-10-08	17:00	18:00	100	Y	24.1	27.9	
Ednah Natural Bridge	EDNA	38.9858	-110.4298	0	2018-03-17	22:00	22:30	200	Y	16.8	12.4	EDNA is 30 min. long; ref. is 60 min. and starts 90 min. prior
Landscape Arch	LAND	38.7907	-109.6072	135	2015-05-05	20:45	21:45	100	Y	17.1	20.9	
Little Bridge Arch	LTBR	38.5423	-109.6128	20	2017-12-15	17:25	17:55	250	Y	4.8	3.8	30 min data block
Longbow Arch	LNGB	38.4336	-109.6796	105	2016-06-12	13:00	14:00	100	Y	26.1	23.2	
Moonrise Arch	MRIS	40.5561	-109.5461	46	2018-07-18	7:00	7:30	200	Y	25.1	27.0	MRISA+B are 30 min long
Moonshine Arch	MOON	37.3730	-111.0473	130	2018-04-16	21:15	22:15	200	Y	19.7	23.4	
Musselman Arch	MUSS	38.4359	-109.7698	37	2017-12-14	20:10	22:15	250	-	9.2	10.0	
Owachomo Bridge	OWO	37.5823	-110.0141	69	2016-12-04	15:00	16:00	100	N	-2.4	-5.9	
Rainbow Arch	RAIN	37.0774	-110.9643	148	2016-11-05	20:20	21:20	250	Y	16.8	17.8	
Rainbow Bridge	RAB	38.6156	-109.6226	54	2015-03-24	2:00	3:00	100	Y	20.5	18.9	Same as RABC+D from Moore et al. (2016) paper
Squint Arch	SQNT	38.6465	-110.6739	130	2018-02-01	21:30	22:30	200	Y	11.6	11.3	
Sunset Arch	SSET	37.3759	-111.0484	6	2018-07-18	4:00	5:00	200	Y	27.7	29.2	
Two Bridges	TWBR	37.6212	-112.1639	57	2016-11-04	23:30	0:30	200	N	-	9.2	