

ANMO near-surface seismic survey 2023

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In August 2023 a transect of 11 nodal seismographs spanned about 300 meters centered atop the ANMO borehole seismometers of the Global Seismic Networked hosted at the USGS Albuquerque Seismic Lab (ASL). Sledge hammer sources were the primary focus for seismic data recording. The shot table included in the archive was derived by manual phase picking conducted by UNM graduate student Ian Podmore. The absolute times were picked using a nodal seismograph that was moved to each source location (that was not one of the 11 recording nodes). This 'timing node' was placed <0.5 meters from the hammer strike plate and then the onset of the strike was identified on the seismogram of the timing node by visual inspection. Hammer source and node locations were surveyed with differential GPS, with the instrument typically indicating accuracy of ~0.2 m. Hammer strikes generally produced clear arrivals across the node transect and on several permanent seismometers recording at ASL, including the two ANMO boreholes. The availability of borehole recording should enable constraints on seismic velocity extending to greater depth than is typically feasible with sledge hammer strikes.

Array_no	Shot_no	Lat	Lon	Elevation (m)	Shot Time
1	1	34.9456364	-106.4571536	1820.20	2023-08-28T16:24:29.756000
1	2	34.9456364	-106.4571536	1820.20	2023-08-28T16:24:41.192000
1	3	34.9456364	-106.4571536	1820.20	2023-08-28T16:24:49.628000
1	4	34.9456364	-106.4571536	1820.20	2023-08-28T16:24:58.356000
1	5	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:07.224000
1	6	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:15.796000
1	7	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:24.216000
1	8	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:33.592000
1	9	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:42.136000
1	10	34.9456364	-106.4571536	1820.20	2023-08-28T16:25:50.912000
1	11	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:11.800000
1	12	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:20.408000
1	13	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:28.720000
1	14	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:36.784000
1	15	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:44.796000
1	16	34.9456364	-106.4571536	1820.20	2023-08-28T16:26:52.796000
1	17	34.9456364	-106.4571536	1820.20	2023-08-28T16:27:00.776000
1	18	34.9456364	-106.4571536	1820.20	2023-08-28T16:27:08.784000
1	19	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:02.080000
1	20	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:10.120000
1	21	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:21.364000
1	22	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:28.992000
1	23	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:39.148000
1	24	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:46.844000
1	25	34.9457254	-106.4571665	1820.36	2023-08-28T16:31:54.300000
1	26	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:01.804000
1	27	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:09.060000
1	28	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:16.604000
1	29	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:24.920000
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1	31	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:39.968000
1	32	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:47.644000
1	33	34.9457254	-106.4571665	1820.36	2023-08-28T16:32:55.292000
1	34	34.9457254	-106.4571665	1820.36	2023-08-28T16:33:02.648000
1	35	34.9457254	-106.4571665	1820.36	2023-08-28T16:33:10.612000
1	36	34.9457254	-106.4571665	1820.36	2023-08-28T16:33:18.476000
1	37	34.9457254	-106.4571665	1820.36	2023-08-28T16:33:26.008000
1	38	34.9457254	-106.4571665	1820.36	2023-08-28T16:33:34.696000
1	39	34.9458143	-106.4571765	1820.61	2023-08-28T16:36:42.268000
1	40	34.9458143	-106.4571765	1820.61	2023-08-28T16:36:51.016000
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1	43	34.9458143	-106.4571765	1820.61	2023-08-28T16:37:15.808000
1	44	34.9458143	-106.4571765	1820.61	2023-08-28T16:37:24.400000
1	45	34.9458143	-106.4571765	1820.61	2023-08-28T16:37:32.520000
1	46	34.9458143	-106.4571765	1820.61	2023-08-28T16:37:41.072000
1	47	34.9458143	-106.4571765	1820.61	2023-08-28T16:37:49.784000
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1	49	34.9458143	-106.4571765	1820.61	2023-08-28T16:38:06.480000
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1	51	34.9458143	-106.4571765	1820.61	2023-08-28T16:38:24.276000
1	52	34.9458143	-106.4571765	1820.61	2023-08-28T16:38:33.676000
1	53	34.9458143	-106.4571765	1820.61	2023-08-28T16:38:42.412000
1	54	34.9458143	-106.4571765	1820.61	2023-08-28T16:38:51.140000
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1	56	34.9458143	-106.4571765	1820.61	2023-08-28T16:39:11.984000
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1	59	34.9459252	-106.4571904	1820.80	2023-08-28T16:41:46.968000
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1	64	34.9459252	-106.4571904	1820.80	2023-08-28T16:42:24.020000
1	65	34.9459252	-106.4571904	1820.80	2023-08-28T16:42:31.536000
1	66	34.9459252	-106.4571904	1820.80	2023-08-28T16:42:38.980000
1	67	34.9459252	-106.4571904	1820.80	2023-08-28T16:42:46.820000
1	68	34.9459252	-106.4571904	1820.80	2023-08-28T16:42:54.484000
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1	71	34.9459252	-106.4571904	1820.80	2023-08-28T16:43:18.592000
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1	73	34.9459252	-106.4571904	1820.80	2023-08-28T16:43:34.404000
1	74	34.9459252	-106.4571904	1820.80	2023-08-28T16:43:42.184000
1	75	34.9459252	-106.4571904	1820.80	2023-08-28T16:43:49.984000
1	76	34.9459252	-106.4571904	1820.80	2023-08-28T16:43:57.392000
1	77	34.9459252	-106.4571904	1820.80	2023-08-28T16:44:05.136000
1	78	34.9459252	-106.4571904	1820.80	2023-08-28T16:44:13.048000
1	79	34.9460018	-106.4571965	1820.77	2023-08-28T16:45:56.812000
1	80	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:05.808000
1	81	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:14.300000
1	82	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:22.392000
1	83	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:30.784000
1	84	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:39.052000
1	85	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:47.320000
1	86	34.9460018	-106.4571965	1820.77	2023-08-28T16:46:55.516000
1	87	34.9460018	-106.4571965	1820.77	2023-08-28T16:47:03.696000
1	88	34.9460018	-106.4571965	1820.77	2023-08-28T16:47:11.632000
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1	91	34.9460018	-106.4571965	1820.77	2023-08-28T16:47:36.364000
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1	93	34.9460018	-106.4571965	1820.77	2023-08-28T16:47:53.516000
1	94	34.9460018	-106.4571965	1820.77	2023-08-28T16:48:01.752000
1	95	34.9460018	-106.4571965	1820.77	2023-08-28T16:48:10.448000
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1	97	34.9460018	-106.4571965	1820.77	2023-08-28T16:48:27.048000
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1	104	34.9460883	-106.4572153	1820.54	2023-08-28T16:50:55.552000
1	105	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:03.768000
1	106	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:13.992000
1	107	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:22.564000
1	108	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:31.108000
1	109	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:40.388000
1	110	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:49.448000
1	111	34.9460883	-106.4572153	1820.54	2023-08-28T16:51:57.644000
1	112	34.9460883	-106.4572153	1820.54	2023-08-28T16:52:06.072000
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1	114	34.9460883	-106.4572153	1820.54	2023-08-28T16:52:22.996000
1	115	34.9460883	-106.4572153	1820.54	2023-08-28T16:52:31.540000
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1	119	34.9461771	-106.4572284	1820.62	2023-08-28T16:55:39.316000
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1	122	34.9461771	-106.4572284	1820.62	2023-08-28T16:56:01.812000
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1	126	34.9461771	-106.4572284	1820.62	2023-08-28T16:56:33.568000
1	127	34.9461771	-106.4572284	1820.62	2023-08-28T16:56:41.488000
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1	172	34.9463544	-106.4572580	1819.68	2023-08-28T17:06:09.116000
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1	174	34.9463544	-106.4572580	1819.68	2023-08-28T17:06:25.768000
1	175	34.9463544	-106.4572580	1819.68	2023-08-28T17:06:33.616000
1	176	34.9463544	-106.4572580	1819.68	2023-08-28T17:06:41.668000
1	177	34.9463544	-106.4572580	1819.68	2023-08-28T17:06:50.392000
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1	180	34.9464466	-106.4572715	1819.30	2023-08-28T17:09:02.876000
1	181	34.9464466	-106.4572715	1819.30	2023-08-28T17:09:11.456000
1	182	34.9464466	-106.4572715	1819.30	2023-08-28T17:09:20.072000
1	183	34.9464466	-106.4572715	1819.30	2023-08-28T17:09:28.900000
1	184	34.9464466	-106.4572715	1819.30	2023-08-28T17:09:37.384000
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1	189	34.9464466	-106.4572715	1819.30	2023-08-28T17:10:17.742000
1	190	34.9464466	-106.4572715	1819.30	2023-08-28T17:10:25.692000
1	191	34.9464466	-106.4572715	1819.30	2023-08-28T17:10:34.796000
1	192	34.9464466	-106.4572715	1819.30	2023-08-28T17:10:43.120000
1	193	34.9464466	-106.4572715	1819.30	2023-08-28T17:10:51.752000
1	194	34.9464466	-106.4572715	1819.30	2023-08-28T17:11:00.296000
1	195	34.9464466	-106.4572715	1819.30	2023-08-28T17:11:08.712000
1	196	34.9464466	-106.4572715	1819.30	2023-08-28T17:11:17.244000
1	197	34.9464466	-106.4572715	1819.30	2023-08-28T17:11:25.588000
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1	404	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:01.380000
1	405	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:10.152000
1	406	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:25.252000
1	407	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:35.544000
1	408	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:45.492000
1	409	34.9445069	-106.4569910	1816.75	2023-08-28T19:19:54.440000
1	410	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:04.668000
1	411	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:13.312000
1	412	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:22.352000
1	413	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:32.456000
1	414	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:41.880000
1	415	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:50.552000
1	416	34.9445069	-106.4569910	1816.75	2023-08-28T19:20:59.188000
1	417	34.9445069	-106.4569910	1816.75	2023-08-28T19:21:08.748000
1	418	34.9445069	-106.4569910	1816.75	2023-08-28T19:21:18.444000
1	419	34.9445069	-106.4569910	1816.75	2023-08-28T19:21:34.592000
1	420	34.9445069	-106.4569910	1816.75	2023-08-28T19:21:44.212000
1	421	34.9445069	-106.4569910	1816.75	2023-08-28T19:21:52.980000
1	422	34.9442370	-106.4569558	1818.48	2023-08-28T19:25:57.844000
1	423	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:06.776000
1	424	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:15.300000
1	425	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:23.760000
1	426	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:32.520000
1	427	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:41.464000
1	428	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:49.644000
1	429	34.9442370	-106.4569558	1818.48	2023-08-28T19:26:58.116000
1	430	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:06.804000
1	431	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:15.736000
1	432	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:24.872000
1	433	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:33.208000

1	434	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:41.348000
1	435	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:49.904000
1	436	34.9442370	-106.4569558	1818.48	2023-08-28T19:27:58.244000
1	437	34.9442370	-106.4569558	1818.48	2023-08-28T19:28:06.688000
1	438	34.9442370	-106.4569558	1818.48	2023-08-28T19:28:15.284000
1	439	34.9442370	-106.4569558	1818.48	2023-08-28T19:28:23.588000
1	440	34.9442370	-106.4569558	1818.48	2023-08-28T19:28:32.844000
1	441	34.9442370	-106.4569558	1818.48	2023-08-28T19:28:41.728000
1	442	34.9442370	-106.4569558	1818.48	2023-08-28T19:29:36.544000
1	443	34.9442370	-106.4569558	1818.48	2023-08-28T19:30:50.956000
1	444	34.9442370	-106.4569558	1818.48	2023-08-28T19:30:59.996000
1	445	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:08.624000
1	446	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:18.804000
1	447	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:27.340000
1	448	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:35.504000
1	449	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:44.068000
1	450	34.9442370	-106.4569558	1818.48	2023-08-28T19:31:52.368000
1	451	34.9442370	-106.4569558	1818.48	2023-08-28T19:32:01.184000
1	452	34.9439895	-106.4569174	1820.20	2023-08-28T19:35:20.068000
1	453	34.9439895	-106.4569174	1820.20	2023-08-28T19:35:38.416000
1	454	34.9439895	-106.4569174	1820.20	2023-08-28T19:35:52.420000
1	455	34.9439895	-106.4569174	1820.20	2023-08-28T19:36:36.352000
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1	457	34.9439895	-106.4569174	1820.20	2023-08-28T19:37:58.422000
1	458	34.9439895	-106.4569174	1820.20	2023-08-28T19:38:07.244000
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1	460	34.9439895	-106.4569174	1820.20	2023-08-28T19:38:25.672000
1	461	34.9439895	-106.4569174	1820.20	2023-08-28T19:38:35.256000
1	462	34.9439895	-106.4569174	1820.20	2023-08-28T19:38:53.528000
1	463	34.9439895	-106.4569174	1820.20	2023-08-28T19:39:02.292000
1	464	34.9439895	-106.4569174	1820.20	2023-08-28T19:39:02.292000

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1	466	34.9439895	-106.4569174	1820.20	2023-08-28T19:39:40.164000
1	467	34.9439895	-106.4569174	1820.20	2023-08-28T19:39:50.268000
1	468	34.9439895	-106.4569174	1820.20	2023-08-28T19:40:09.556000
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1	472	34.9439895	-106.4569174	1820.20	2023-08-28T19:40:47.336000
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1	476	34.9439895	-106.4569174	1820.20	2023-08-28T19:41:56.236000
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1	478	34.9439895	-106.4569174	1820.20	2023-08-28T19:42:13.816000
1	479	34.9439895	-106.4569174	1820.20	2023-08-28T19:42:22.804000
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