

13-012 - HRIII Project Report

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Objective

The objective of the experiment was to acquire a new and unique dataset of seismic measurements from explosions in different lithology and emplacement conditions. The explosions were conducted at Kirtland Air Force Base (KAFB) and White Sands Missile Range (WSMR), NM.

Seismic Stations

Figures 1 and 2 show the locations of the seismic stations relative to the test sites. Array 1 recorded shots on KAFB, while Arrays 2-4 were installed to record 2 shots each at the 3 WSMR test sites. The 2 Hz L-22 seismometers were oriented to true north, leveled, and covered with dirt. Data for all stations were recorded at 1000 sps on a Reftek RT130 DAS, supplied by PASSCAL. An external GPS clock acquired UTC time. Table 1 lists the station locations. Table 2 provides nominal L-22 sensitivities. RT130 bit weights are included for each recorder with the submitted data.



Figure 1. Map of Array 1 seismic stations (triangles) and shot locations (orange flames) on KAFB. (Google Earth Background).

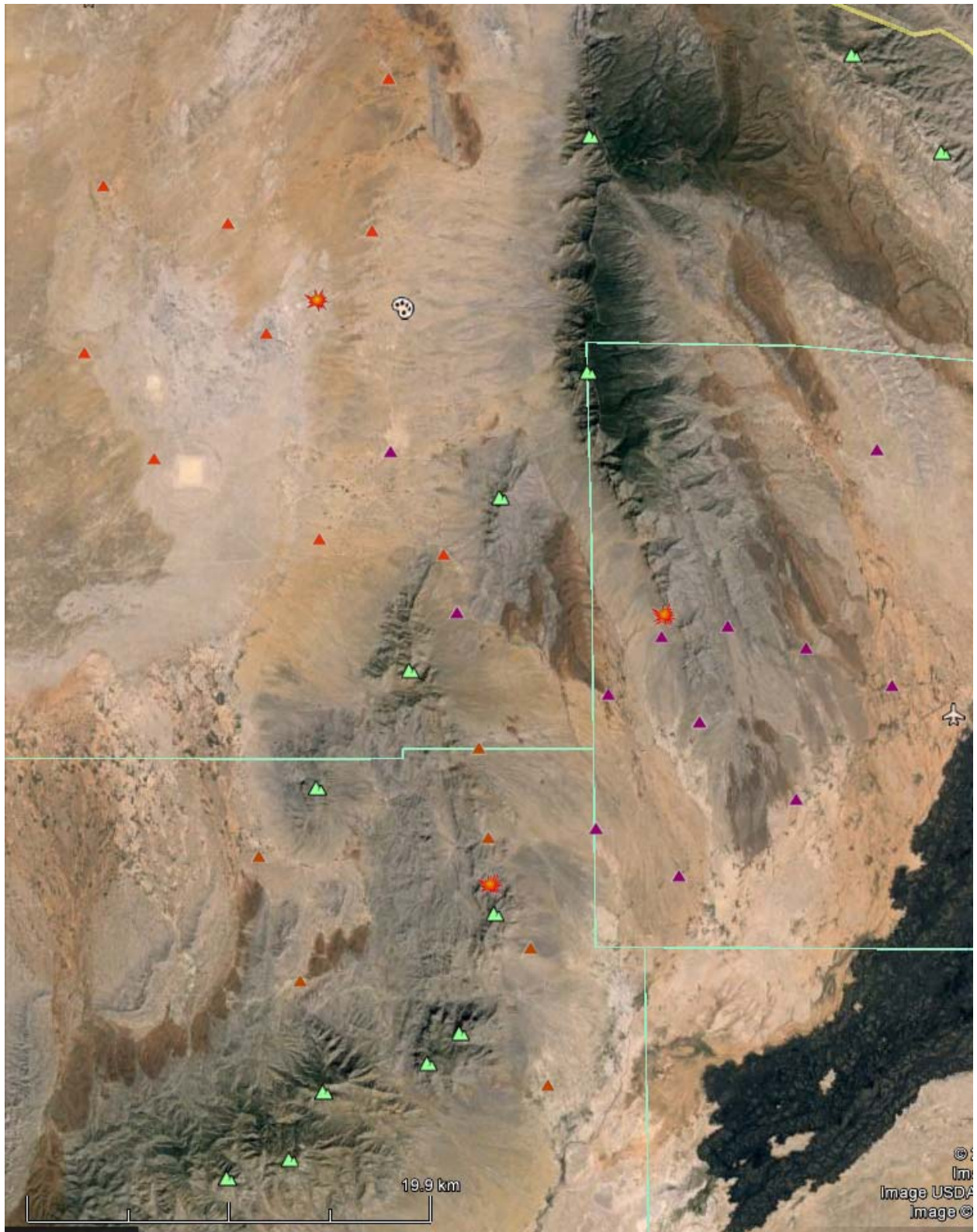


Figure 2. Map of Arrays 2-4 seismic stations (triangles) and shot locations (orange flames) on WSMR. (Google Earth Background).

Table 1. Array 1-4 Seismic Sensors.

Station	Lat	Lon	Elev (m)	DAS	Array	Station	Lat	Lon	Elev (m)	DAS	Array
WC01	34.94849	-106.54578	1643	986B	1	CP01	33.53970	-106.44544	1622	B35F	2
WC02	34.94862	-106.54737	1604	A920	1	CP02	33.49076	-106.31599	1409	9364	2
WC03	34.94893	-106.54905	1601	988E	1	CP03	33.42172	-106.32742	1318	91F0	2
WC04	34.94950	-106.55064	1599	9343	1	CP04	33.32769	-106.39816	1274	91F1	2
WC05	34.95024	-106.55214	1597	9489	1	CP05	33.37497	-106.52981	1588	B3C1	2
WC06	34.95116	-106.55345	1594	92E5	1	CP06	33.43052	-106.55242	1533	B3D3	2
WC07	34.95214	-106.55454	1591	92DF	1	CP07	33.47917	-106.43401	1597	935F	2
WC08	34.95344	-106.55544	1590	948D	1	CP08	33.44302	-106.37186	1365	91F2	2
WC09	34.95472	-106.55606	1591	924B	1	CP09	33.38959	-106.40680	1411	B3B8	2
WC10	34.95611	-106.55614	1591	9900	1	CP10	33.43909	-106.42922	1459	B32D	2
WC11	34.95753	-106.55659	1590	9288	1	CTS01	33.77871	-106.48312	1541	91F1	3
WC12	34.95892	-106.55649	1591	92E7	1	CTS02	33.56566	-106.45299	1562	935F	3
WC13	34.96031	-106.55609	1592	9442	1	CTS03	33.57257	-106.52037	1450	B3C1	3
WC14	34.96156	-106.55547	1593	9254	1	CTS04	33.60864	-106.60969	1426	AB01	3
WC15	34.96278	-106.55457	1594	983E	1	CTS05	33.65600	-106.64747	1436	B36B	3
WC16	34.96387	-106.55343	1597	955A	1	CTS06	33.73087	-106.63749	1448	AAF2	3
WC17	34.96477	-106.55212	1599	9819	1	CTS07	33.66473	-106.54929	1425	B3D3	3
WC18	34.96552	-106.55066	1601	9541	1	CTS08	33.71056	-106.49203	1493	B3B8	3
WC19	34.96605	-106.54907	1604	9549	1	CTS09	33.61172	-106.48190	1496	B3E2	3
WC20	34.96639	-106.54741	1606	92C8	1	CTS10	33.71406	-106.57011	1448	B32D	3
WC21	34.96650	-106.54570	1609	92D0	1	S01	33.61229	-106.22042	1570	91F1	4
WG01	34.94798	-106.47423	1758	9455	1	S02	33.50681	-106.21281	1407	935F	4
WG02	34.94811	-106.47592	1752	9140	1	S03	33.45596	-106.26434	1359	B3C1	4
WG03	34.94844	-106.47760	1749	933A	1	S04	33.42172	-106.32742	1318	91F0	4
WG04	34.94898	-106.47919	1743	9470/947D	1	S05	33.44302	-106.37186	1365	91F2	4
WG05	34.94969	-106.48070	1740	9859	1	S06	33.53970	-106.44544	1622	B35F	4
WG06	34.95058	-106.48193	1739	995C	1	S07	33.61172	-106.48190	1496	B3E2	4
WG07	34.95171	-106.48309	1741	9C32	1	S08	33.52368	-106.25881	1459	B3B8	4
WG08	34.95291	-106.48398	1738	92AD	1	S09	33.49076	-106.31599	1409	9364	4
WG09	34.95423	-106.48463	1738	9849	1	S10	33.52890	-106.33612	1517	B32D	4
WG10	34.95561	-106.48506	1739	930D	1	S12	33.53350	-106.30066	1546	B3D3	4
WG11	34.95703	-106.48519	1735	9292	1	S14	33.50311	-106.36501	1441	9297	4
WG12	34.95839	-106.48507	1738	92A1	1						
WG13	34.95979	-106.48467	1738	92E4	1						
WG14	34.96109	-106.48397	1740	9517	1						
WG15	34.96232	-106.48307	1741	9333	1						
WG16	34.96362	-106.48219	1740	988A	1						

Station	Lat	Lon	Elev (m)	DAS	Array	Station	Lat	Lon	Elev (m)	DAS	Array
WG17	34.96427	-106.48067	1772	9236	1						
WG18	34.96502	-106.47919	1744	9289	1						
WG19	34.96556	-106.47760	1746	9865	1						
WG20	34.96589	-106.47595	1750	9334	1						
WG21	34.96602	-106.47429	1782	92BD	1						

Table 2. L-22 Sensitivity.

Channel	Sensitivity (V/m/s)
1	-88
2	88
3	88

Explosions

A series of explosions were conducted at KAFB and WSMR in variable source material (alluvium, limestone, granite) and source depth (over-buried to height-of-burst). Table 3 provides pertinent shot information.

Table 3. Blast size and origin information

Event	Date	DOY	Time	Lat	Lon	Elev (m)	Depth (m)	Size (kg)
1	5/8/2012	129	17:29:00.004	34.95710	-106.47489	1762	7.0	90
2	5/9/2012	130	17:15:00.004	34.95658	-106.47815	1748	3.9	408
3	5/10/2012	131	16:50:00.004	34.95710	-106.47489	1762	-2.0	90
4	5/10/2012	131	21:15:00.004	34.95720	-106.47461	1759	7.5	227
5	5/11/2012	132	17:40:00.008	34.95754	-106.54525	1606	7.0	90
6	5/11/2012	132	20:45:00.008	34.95760	-106.54525	1606	-2.0	90
7	5/14/2012	135	17:00:00.008	34.95870	-106.54310	1610	3.1	317
8	5/14/2012	135	21:30:00.008	34.95847	-106.54321	1610	3.0	316
9	5/15/2012	136	16:35:00.008	34.95847	-106.54284	1610	-0.2	45
10	5/15/2012	136	22:30:00.008	34.95923	-106.54516	1605	-1.3	907
11	5/16/2012	137	20:27:00.008	34.95867	-106.54278	1610	-1.1	136
12	5/17/2012	138	21:38:00.008	34.95856	-106.54592	1606	-0.7	136
13	5/18/2012	139	16:30:00.004	34.95710	-106.47489	1762	6.9	90
14	8/14/2012	227	23:14:00.000	33.4190	-106.4276	1589	0.0	18144
15	8/16/2012	229	18:10:00.000	33.4190	-106.4288		0.0	18144
16	8/19/2012	232	23:26:00.000	33.6804	-106.5228		0.0	9072
17	8/24/2012	237	17:50:00.000	33.6801	-106.5224		0.0	9072
18	8/27/2012	240	23:02:00.000	33.5397	-106.3356		0.0	45359
19	8/31/2012	244	17:53:00.000	33.5382	-106.3354		0.0	45359

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