Geologic and Geophysical Analysis of the Desert Peak-Brady Geothermal Fields: Structural Controls on Geothermal Reservoirs in the Humboldt Structural Zone

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A micro-earthquake (MEQ) survey was conducted at the Brady-Desert Peak geothermal area in 2004 as part of an integrated geological and geophysical study of the geothermal field. Nine high gain portable digital recorders were deployed at the locations shown in Figure 1 and Table 1. The instruments were configured with L-22 three-component seismometers and programmed to record in an event-trigger mode. Data was collected at the sites on local SCSI disk drives and downloaded periodically over the deployment period. During the last 2 months of the deployment the L22's were replaced by L-10's and L-4's due to the non-availability of the L-22's.
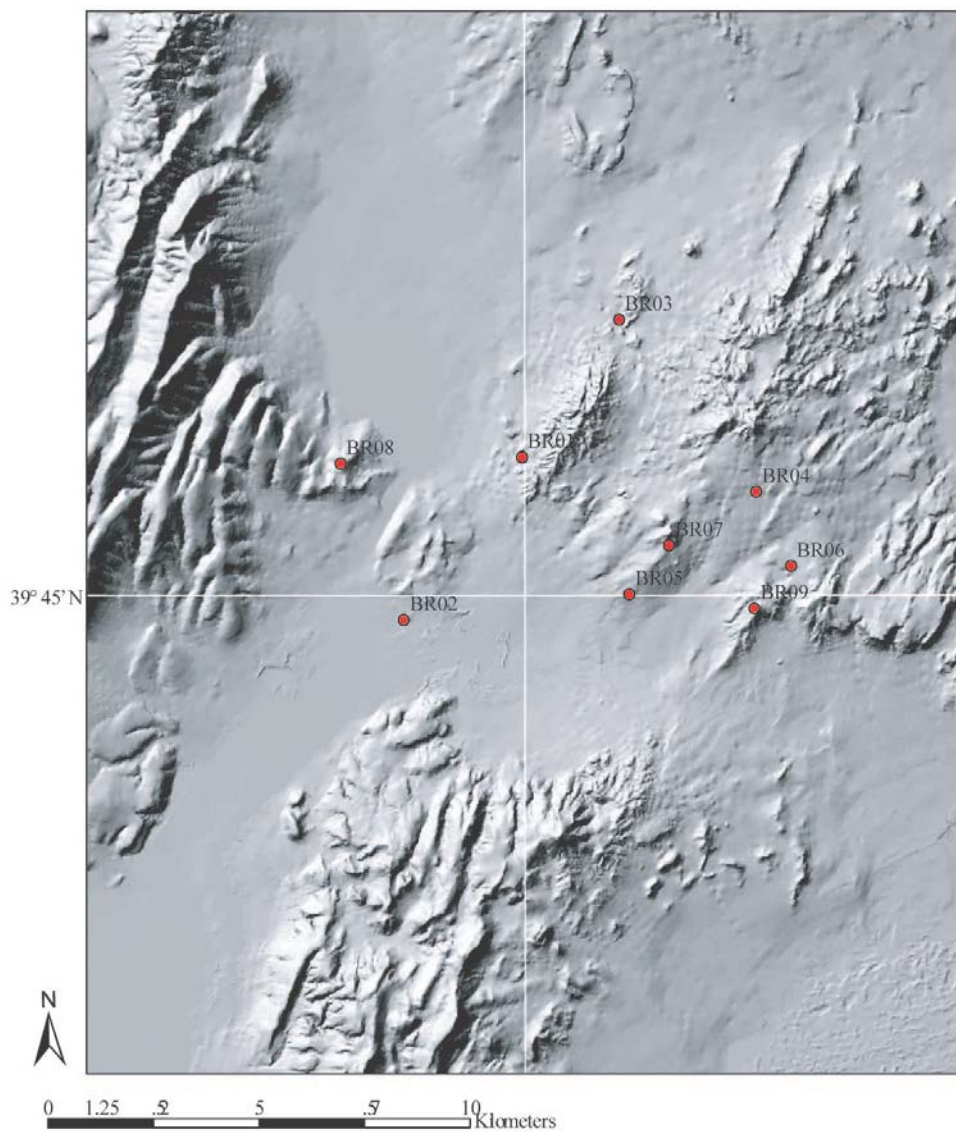

Figure 1: Maps showing locations of MEQ stations deployed during the Brady-Desert peak micro-earthquake study.

Table 1: Locations of stations deployed during the MEQ study at Desert Peak- Brady area. The type of sensors and the serial numbers of the RefTek 72a-07 dataloggers used during the study are also shown.

Station Name	Station Location		Sensor		DAS 72a-07 S/N Deployed at Station		
	Latitude	Longitude	2004:126-279	2004:279-344			
BR01	39.77963	-119.00077	L22	L10	7597	7443	7622
BR02	39.74488	-119.03342	L22	L10	7345	-	-
BR03	38.80890	-118.97377	L22	L10	7458	7608	-
BR04	39.77217	-118.93588	L22	L10	7439	-	-
BR05	39.75037	-118.97103	L22	-	7621	-	-
BR06	39.75633	-118.92633	L22	L4	7455	7626	-
BR07	39.76080	-118.95998	L22	L4	7281	-	-
BR08	39.77827	-119.05097	L22	L4	7282	-	-
BR09	39.74730	-118.93640	L22	L4	7445	-	-

Waveform data was collected in standard PASSCAL Reftek format and converted to SEGY format files on SUN UNIX computer systems. Phase arrival picking was done using the PSQL software provided by PASSCAL. Earthquake records were easily recognized from noise triggers. All earthquake records were sub-set from the complete dataset and the noise triggers were set aside. The total number of triggers examined is shown in Table 2.

Table 2: Total number of triggers examined during the 6-month MEQ deployment. Out of these 16 were identified as MEQ events.

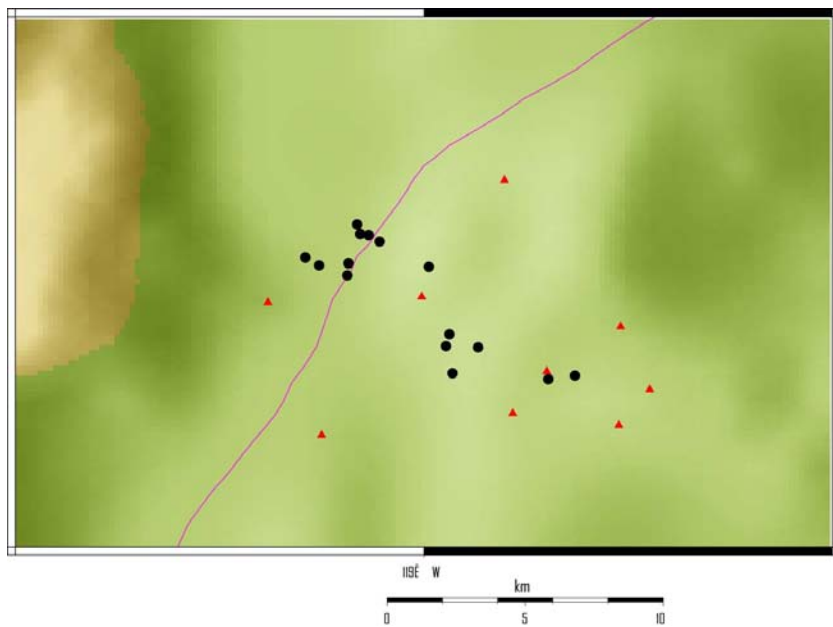| Day	Total Number of Triggers
165	6,463
191	12,511
216	19,850
279	71,840
344	53,418

Figure 2: Maps showing MEQ epicenters (black circles) and the recording stations (red triangles).