

QUARTERLY TECHNICAL REPORT 78 - C

for

HANFORD SEISMIC NETWORK

July 1 through September 31 1978

Geophysics Program

University of Washington

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TASK AGREEMENT NO. 39

and

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
CONTRACT NO. C-10976

Operations.

The eastern Washington seismic array has continued in operation in virtually was performed and several stations had their power supplies converted to 5 volt units from  $\pm 12$  volt ones. We have had more than the usual problems with the phone lines during this period. There has been a consistent problem with the phone lines in the immediate Hanford area due to changes in carrier systems out of the Midway substation. We also continue to experience periodic noise interference on our Gable Mountain radio receiver. Because of these problems our stations MID, GBL, and WA2 were down more than usual. When all three were down at the same time (about 20% of the time) our detection and location ability in the Saddle Mountains area decreased. We estimate the location threshold in this area was about magnitude 1.5 at worst case, rather than about magnitude 0.5 when all stations are up.

We have received word from the U.S. Geological Survey that a new computer Washington networks. The system consists of two Digital Equipment Corp. PDP-11 computers. A PDP-11/35 will constantly monitor all incoming seismic signals and detect and record in digital format all suspected earthquakes and blasts. A PDP-11/70 will be used off-line to process the data from the on-line system and for general use by the Geophysics Program. These systems will significantly improve the quality of our data. We anticipate the ability to use the present eastern Washington

seismic array for more sophisticated studies of the earthquake hazards in the area. We expect it to take from 2 to 4 months to get the computers installed and operating in a steady-state mode.

#### Data.

The earthquake activity in eastern Washington has returned to the more normal level of around 50 events per quarter from the high of almost 100 events last quarter. Most of the activity is again concentrated in the Lake Chelan - Entiat area and the Saddle Mountains. Because of station problems in the northern Hanford area many events in the Saddle Mountains could not be well-located. We locate and report here in table 2 all earthquakes in this area larger than magnitude 1.5 but there are at least two dozen additional smaller events in this area that were detected but only recorded on three stations.

Included in figure 1 are several events from last quarter which were not reported in the last report because all the data were not available at its preparation time. These events are in the Cle Elum Naches area where there was a felt event on June 26. There was only one event in this area during this quarter. Table 2 lists all the events located for this quarter.

#### Other Studies.

During this quarter we have begun the testing and deployment of broadband digital systems to be used for regional structural and attenuation studies. There will be three of these instruments deployed across the state at about 200km intervals for the purpose of recording surface waves from medium sized to large earthquakes at distances from several hundred to several thousand kilometers. These data will help with the velocity structure studies for the entire state but in particular for the transition between the Columbia basin and the Cascade range. These data will also be used for studying the attenuation of seismic waves as they cross the basin. Inversion for both velocity and attenuation is a technique which is only recently possible because of the quality of digital data.

In anticipation of expanding our array to cover the eastern part of the state we have ordered the necessary electronics and seismometers. Some of this equipment has arrived and is currently being tested. We anticipate beginning the installation of several stations within the next month or so.

TABLE 2. July 1 - Sept. 30, 1978

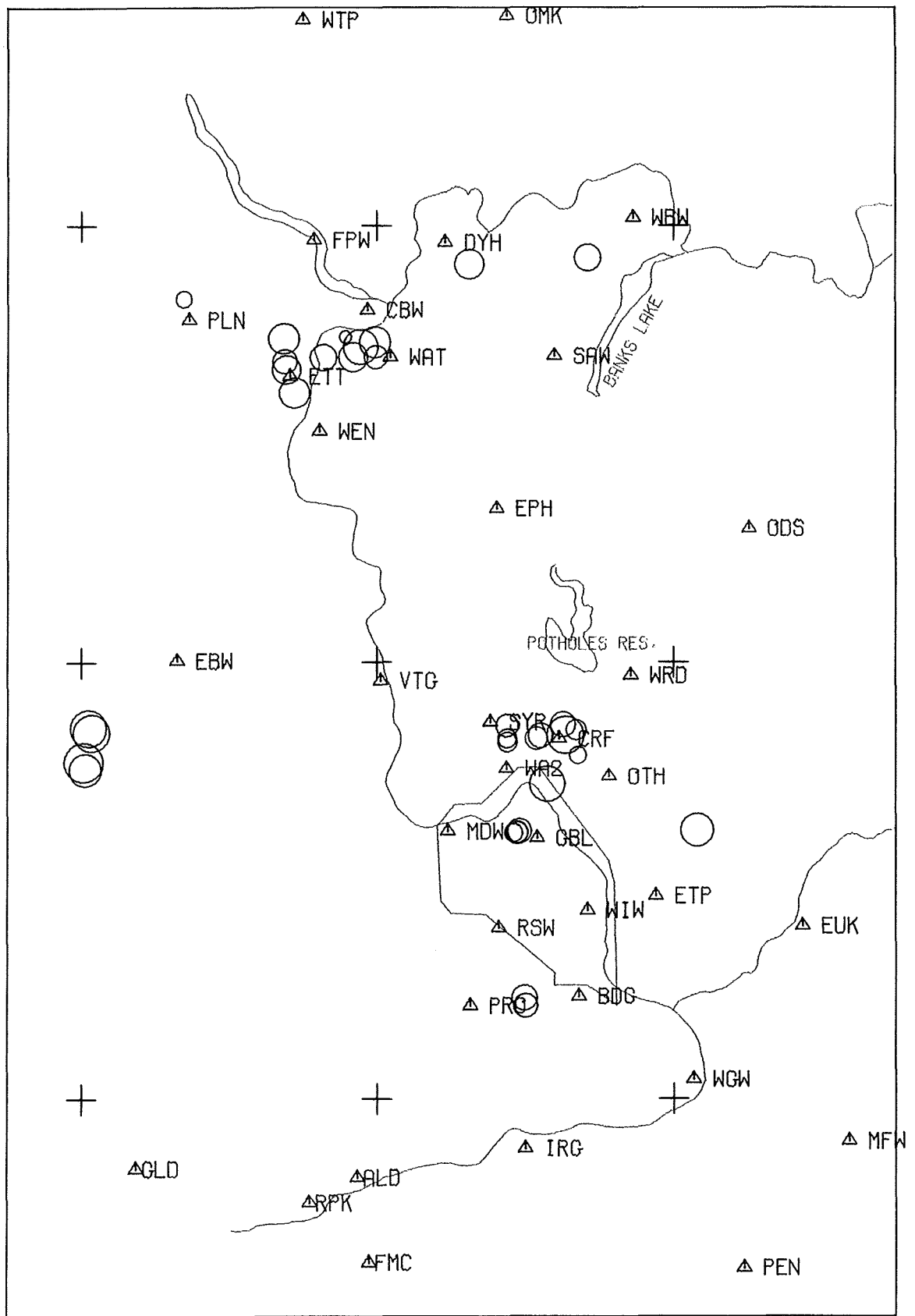
## EASTERN WASHINGTON EARTHQUAKES

(10, 78)

DATE	DAY	TIME	LAT	LONG	DEPTH	MAG	#	Q	TYPE
7/ 3/78	184	1935:26.6	47-44.00	120- 0.42	8.0	1.7	9	B	
7/ 5/78	186	1459:31.7	47-41.96	120- 0.21	9.7	1.1	7	C	
7/ 7/78	188	5 3:25.0	47-40.19	120-18.28	3 0	1.5	7	C	
7/ 9/78	190	16 1: 6.5	46-49.93	119-26.91	4.2	1.2	6	B	
7/10/78	191	319:49.5	47-37.01	120-16.66	2 0	1.7	9	C	
7/12/78	193	10 5:49.4	47-44.47	120-18.82	7 7	1.7	11	B	
7/12/78	193	1714:50.6	47-41.95	120- 4.88	8.5	1.6	13	B	
7/12/78	193	1946:52.9	47-44.75	120- 6.46	1.5	.3	6	D	
7/13/78	194	725:31.3	46-49.67	119-32.78	6 4	1.0	6	D	
7/13/78	194	1151:29.5	46-36.95	118-55.29	5.9	1.9	8	C	
7/13/78	194	21 5:33.5	47-44.50	120-32.97	5.4	.3	5	C	P
7/13/78	194	2123:53.1	47-49.97	120-38.97	5.0	.6	7	C	
7/14/78	195	313: 5.2	46-13.87	119-30.13	1.3	1.3	8	C	
7/16/78	197	1713:45.9	46-50.00	119-21.83	0.7	2.2	7	C	
7/18/78	199	8 6:19.5	46-12.79	119-29.90	4 6	1.2	7	D	
7/26/78	207	038:55.7	46-51.30	119-33.70	7.3	1.0	7	D	
7/26/78	207	2014:34.6	46-49.55	119-33.67	6.1	.8	6	B	
7/26/78	207	2243: 7.8	47- 9.15	118-18.10	0.8	2.0	9	C	P
8/ 6/78	218	1858:30.5	46-51.46	119-22.36	0 5	1.3	6	C	
8/11/78	223	218:34.7	46-50.71	119-19.68	1 5	.9	5	D	
8/13/78	225	14 8: 5.4	47-41.87	120-10.93	9.8	1.4	7	D	
8/15/78	227	2030:31.4	46-43.29	119-25.49	14.9	2.1	11	A	
8/16/78	228	2138: 6.7	46-58.80	119-37.75	1 9	.8	6	D	
8/17/78	229	243:56.8	46-36.55	119-31.67	4 4	1.0	7	B	
8/17/78	229	2249:26.3	47-43.45	118-26.61	3 0	1.1	7	C	P

TABLE 2

DATE	DAY	TIME	LAT	LONG	DEPTH	MAG	#	Q	TYPE
8/18/78	230	2240:14.4	47-53.45	118- 5.67	0.2	1.6	6	C	X
8/19/78	231	250:36.1	46-36.82	119-31.20	6.3	1.2	6	B	
8/19/78	231	1127:54.4	46-49.04	119-33.63	1.4	.8	5	D	
8/22/78	234	1820:29.0	46-36.55	119-32.39	1.4	.7	6	C	
8/23/78	235	538:22.3	46-23.36	119-24.44	1.2	1.1	7	C	
8/23/78	235	829:17.1	47-43.37	120- 3.35	5.8	2.0	13	B	
8/24/78	236	2113:37.1	46-36.67	119-31.70	4.9	1.0	5	C	
9/ 5/78	248	1253:15.6	46-49.55	119-27.74	0.8	1.0	6	C	
9/11/78	254	1149:39.6	47-41.32	120-18.60	9.7	1.2	8	B	
9/15/78	258	18 9:31.5	46-20.14	120-47.38	0.2	2.2	14	D	
9/16/78	259	2155:28.7	47-55.60	119-17.29	8.5	1.4	9	B	
9/18/78	261	158:25.8	46-47.23	119-19.30	5.3	.6	6	D	
9/24/78	267	14 2:17.3	47-54.68	119-41.26	8.5	1.6	9	A	



EASTERN WASHINGTON EARTHQUAKES JULY - SEPT. 1978  
 CENTER OF MAP IS 47.00 N 119.75 W  
 MAGNITUDE KEY ○ 0.0 ○ 1.3 ○ 2.7 ○ 4.0

Figure 1.