

QUARTERLY NETWORK REPORT 85-D
on
Seismicity of Washington and Northern Oregon

October 1 through December 31, 1985

Geophysics Program
University of Washington
Seattle, Washington

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INTRODUCTION

This is the fourth quarterly report of 1985 from the University of Washington Geophysics Program covering seismicity of all of Washington and northern Oregon. These comprehensive quarterlies have been produced since the beginning of 1984. Prior to that we published quarterlies for western Washington in 1983 and for eastern Washington from 1975 to 1983. Annual reports covering seismicity in Washington since 1969 are available from the U. W. Geophysics Program. In collaboration with the University of Washington the State Department of Natural Resources has published catalogs of earthquake activity in western Washington for the period 1970-1979. Annual earthquake catalogs for the whole state are in preparation, beginning with 1980.

This quarterly report discusses network operations, seismicity of the region, and unusual events or findings. This report is preliminary, and not a substitute for detailed technical reports, an annual catalog, or technical papers. In particular, event magnitudes are preliminary, and subject to revision. Some earthquake locations may be revised if new data become available, such as P and S readings from Canadian seismic stations. Findings mentioned in these quarterly reports should not be cited for publication. Fig. 1 shows the major geographical features in the state of Washington and northern Oregon and the seismograph stations currently in operation.

NETWORK OPERATIONS

Table 1 gives approximate periods of time when stations were inoperable. Data for Table 1 are compiled from weekly plots of network-wide teleseismic arrivals, plus records of maintenance and repair visits.

Station DIG, in the crater of Mt. St. Helens, was removed on October 29. This three-component low-gain calibrated station had been installed during the eruption of May, 1985. Since the station site was potentially in the path of mudflows, we decided to remove the equipment before snowfall made the site inaccessible. The USGS station SUG, on the flank of Mt. St. Helens, was replaced by station NSP, located on the dome, on October 1. HSR, installed on the south side of Mt. St. Helens in the third quarter has not yet provided data. Station SHW, also at St.

TABLE 1
Station Outages

Station	Outage Dates	Comments
ASR	Oct. 24 - Nov. 1	Sporadic
	Nov. 15 - Dec. 10	Sporadic
AUG	Oct. 1 - Oct. 22	
BRV	Dec. 19 - Dec. 31	
CPW	Dec. 18 - Dec. 31	
DIG		Station removed Oct. 29
EDM	Oct. 15 - Oct.30	
GLK	Nov. 15 - Dec. 31	Sporadic
GL2	Nov. 25 - Dec. 31	
HSR	Oct. 1 - Dec. 31	
JUN	Oct.1 -Oct. 3	
LVP	Oct. 1 - Oct. 2	
NEL	Oct. 1 - Oct. 18	
NSP		New Station Oct. 1
OBC	Oct. 1 - Nov. 6	Sporadic
	Nov. 17-Dec.10	Sporadic
OBH	Nov. 5 - Dec. 31	Sporadic
OHW	Oct. 26-Nov.15	
ONR	Oct. 4 - Oct. 17	
OOW	Nov. 20- Dec. 10	
OSD	Nov. 19 - Dec. 12	
OSP	Nov. 25 - Dec. 11	
OTR	Oct 25-Nov. 4	
	Nov. 22-Dec. 11	
RSW	Nov. 28 - Dec. 11	
SUG		Moved to NSP Oct. 1
VHO	Oct. 1 - Dec. 31	
WBW	Nov. 12 - Dec. 31	Sporadic

Helens, continues to record intermittent radio interference. The same carrier frequency is used by several stations around the state, in each case for a single short telemetry leg. One such station, NEL, shows the same interference. NEL and SHW are about 300 km apart. We have not been able to trace the source of the interference. Because SHW is the station used for event counts during eruptions, continuous operation is essential to maintain consistency of event counts. We will consider changing the frequency of this station if the interference problem cannot be solved.

Several stations on the Olympic Peninsula lost function for most of the quarter. Telemetry path problems, low batteries, snow, and problems with phone lines all contributed. Station MEW on McNeil Island in south Puget Sound is very low-gain, and also needs a new transmitter.

EARTHQUAKE DATA

There were 434 events processed by the University of Washington digitally recording seismic network between October 1 and December 31, 1985. We determined locations for 274 of these in Washington and Northern Oregon; 227 were classified as earthquakes and 47 as known or suspected blasts. The remaining unlocatable events were regional events outside the U. W. network, or teleseisms. Helicorder records are scanned daily to ensure that significant events are not missed by the on-line digital system. Table 2 is the event catalog for this quarter. Although seven events of M_C 3.0 or larger were located, only one quake (M_C 2.6) was reported felt. We believe that some of the other events may have been felt, but were not reported. In the Mt. St. Helens area, only 19 events were located during the quarter. Fig. 2 shows all earthquakes greater than magnitude 1.0. Fig. 3 shows blasts and probable blasts. Fig. 4 shows all earthquakes located in western Washington. Fig. 5 shows all earthquakes located in eastern Washington. Fig. 6 shows earthquakes located at Mount St. Helens.

Western Washington and Oregon

During the fourth quarter of 1985 161 earthquakes were located between 44.5° and 49.5° latitude and between 121° and 125° longitude. Excluding Mt. St. Helens, 142 earthquakes occurred in western Washington. One felt event of M_C 2.6 on November 1 was located in northern Washington about 20 km east of Bellingham, near where swarm activity occurred during the second quarter. Two other western Washington earthquakes had magnitudes larger than 3.0 but were not reported felt, These included an event near the Elk Lake area on Dec. 26, and one near Mt. Rainier on Dec. 27. In Oregon, a M_C 3.0 event on Nov. 22 was located about 60 km south of Portland. Seismicity in the Puget Lowland was diffuse, and very light. Several shocks were recorded near Darrington, close to the site of a felt event in July, 1985.

Eastern Washington and Oregon

During the fourth quarter of 1985 161 earthquakes were located between 44.5° and 49.5° latitude and between 117° and 121° longitude. Four events above M_C 3.0 were located, 2 were close

together about 40 km NE. of Yakima on Oct. 1, one was near Wenatchee on Oct. 10, and one was about 20 km north of Potholes Reservoir on Nov. 22.

Mount St. Helens Area

Only 19 events were located at Mt. St. Helens during the quarter. An interesting sequence took place on Dec. 31, when a high-frequency event of M_C 1.5 occurred in the midst of a swarm of several dozen events too small to locate. Another high-frequency M_C 2.2 quake was recorded on Dec. 22. These high-frequency quakes are larger than usual for a non-eruptive period.

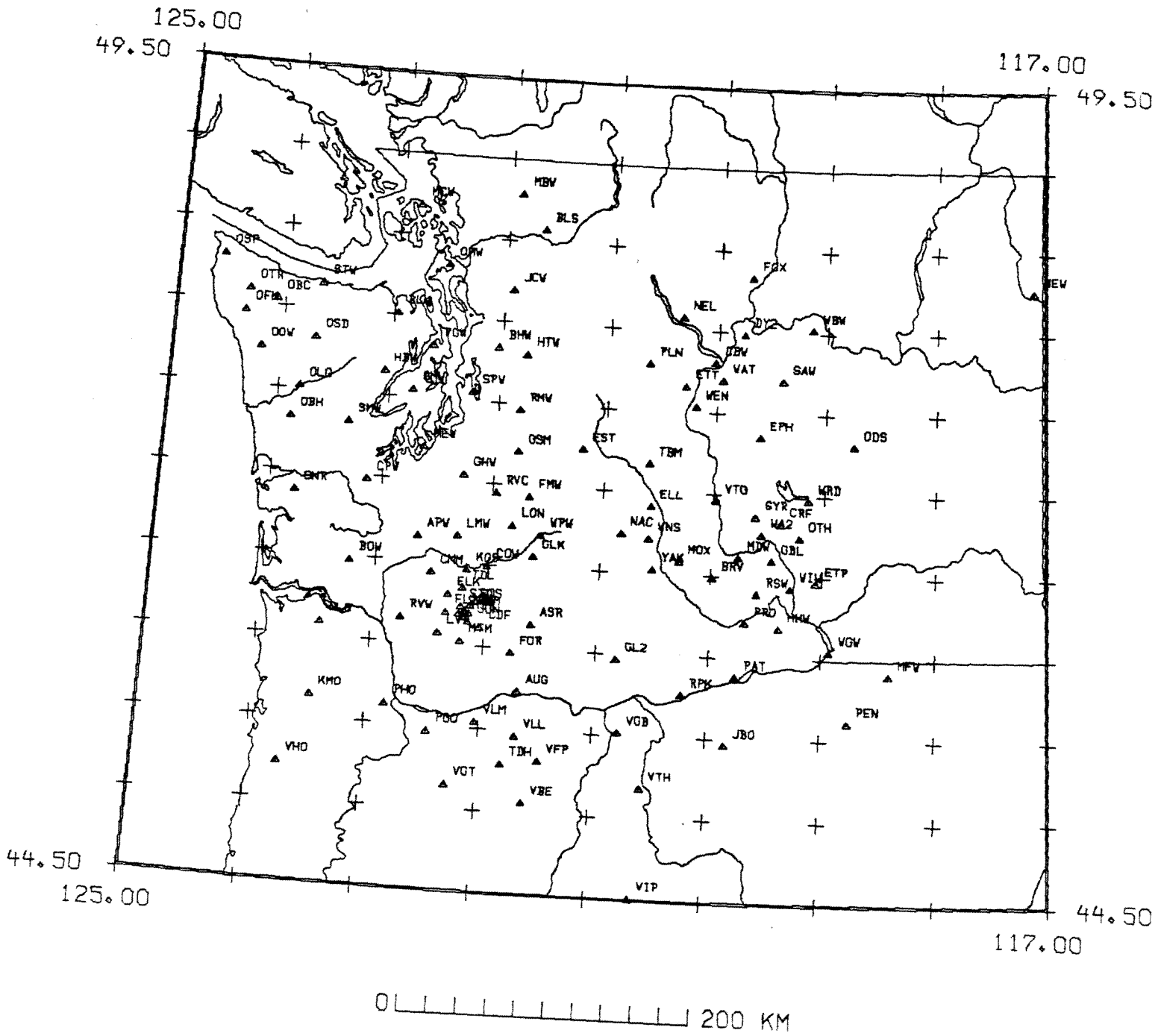


Figure 1. Seismograph stations operating during the fourth quarter 1985.

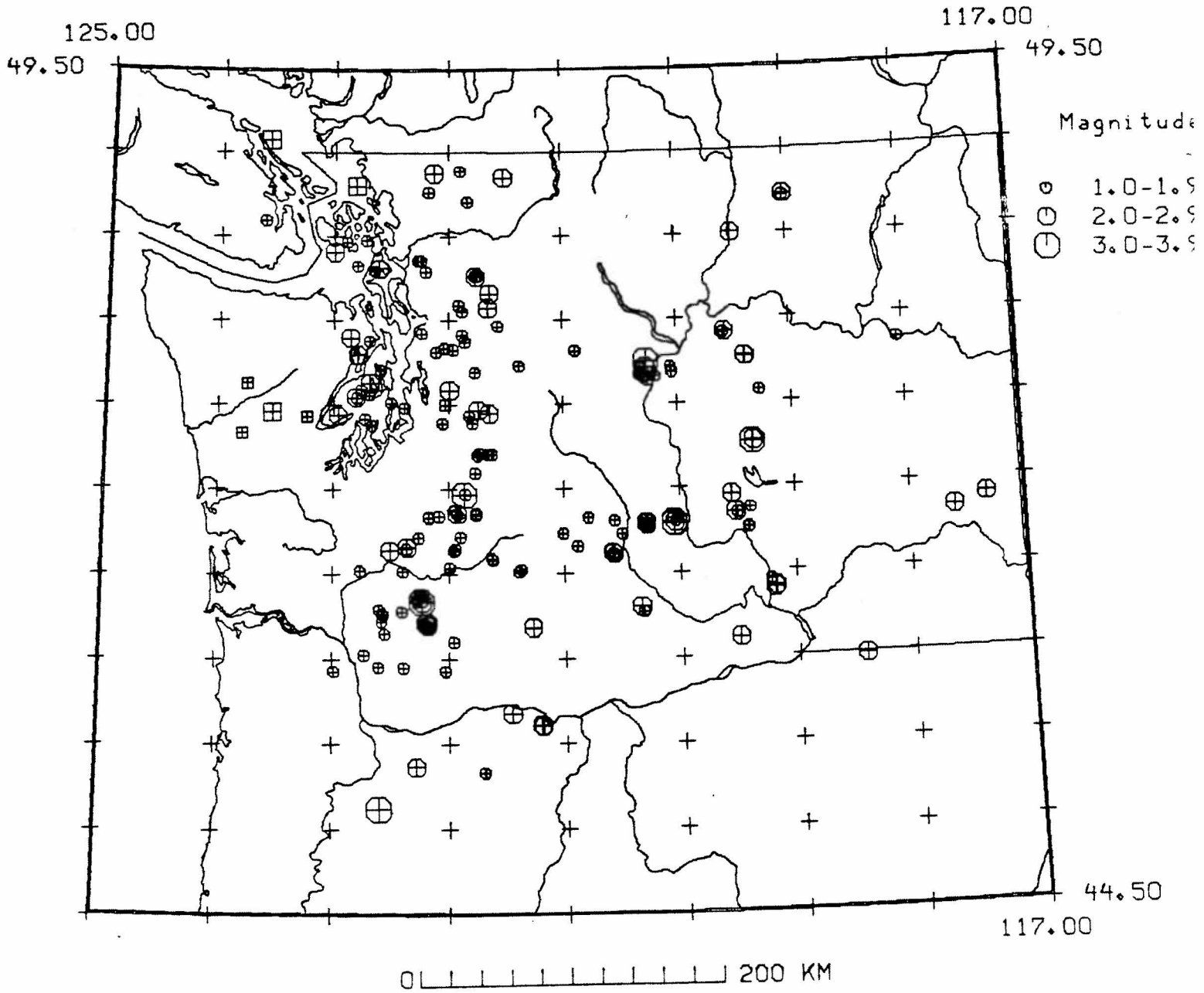


Figure 2. Earthquakes located in the state of Washington and northern Oregon with magnitudes greater than 1.0 from October 1 through December 31 , 1985. Square symbol indicates that event was located with a depth greater than or equal to 30 km. Round symbols are used for events shallower than 30 km.