NORSAR

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

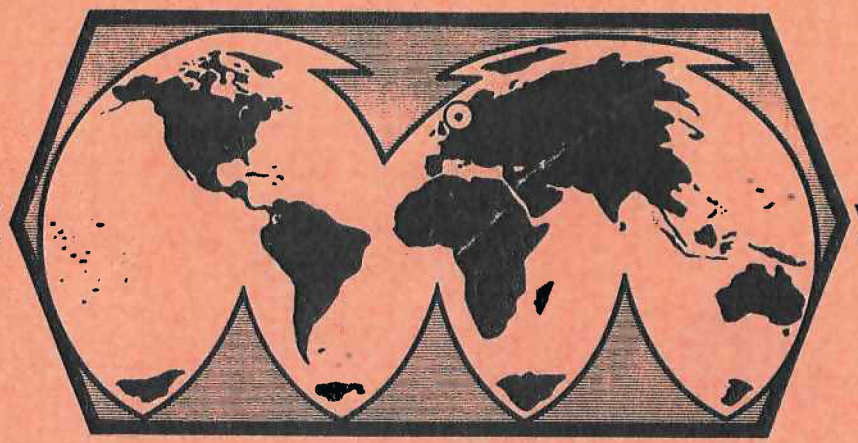
Scientific Report 1-78/79

FINAL TECHNICAL SUMMARY

1 April - 30 September 1978

D. Rieber-Mohn (ed.)

Kjeller, October 1978



VI.2. Evaluation of the Current NORSAR Location Capabilities

The effect of the reduction in the array size has been investigated by comparing the NORSAR locations with the PDE (Preliminary Determination of Epicenters) from the USGS (United States Geological Survey). Because of the delay in the PDE bulletin, only three months of data have been available for comparison from October 1977 to December 1977.

Fig. VI.2.1 shows the NORSAR/USGS location difference for 286 events commonly reported within teleseismic distance from NORSAR (30^{o}-90^{o}). The median location difference is 230 km, which should be compared to the 130 km reported for the same region using the old and larger array (Berteussen et al, 1976). Results on a regionalized basis are shown in Table VI.2.1, where we can see that the increase in the median location difference ranges between 20% and 100% for the different regions. Estimates were not obtained for 6 of the regions because of the limited amounts of data available. We see from the table that while Japan-Kamchatka previously was the best region, it is now Central Asia, with a medium location difference of 170 km.

In considering these results it is important to notice that at the same time as the array was reduced in size (about 50% in diameter), the amount of processing for each event was also reduced, essentially by removing the previous epicentral refinement procedure and using only the beam location from the on-line detection. The effect of the array size reduction itself is therefore smaller than what is reflected in the numbers given in Table VI.2.1.

H. Bungum

Reference

Berteussen, K.-A., H. Bungum and F. Ringdal (1976): Re-evaluation of NORSAR detection and location capabilities, NORSAR Scientified Report 3-75/76.

Regions	Area of Coverage	Jan 73 - Mar 75		Oct 77 - Dec 77		Increase (%)
		Events	Median	Events	Median	
1	Aleutians-Alaska	461	110	38	180	64
2	Western North America	129	130	6	-	-
3	Central America	146	200	6	-	-
4	Mid-Atlantic Ridge	143	150	1	-	-
5	Mediterranean-Middle East	389	300	29	520	73
6	Iran-Western Russia	182	170	11	-	-
7	Central Asia	349	120	32	170	42
8	Southern-Eastern Asia	205	150	21	180	20
9	Ryukuo-Philippines	424	200	39	250	25
10	Japan-Kamchatka	1062	100	82	200	100
11	New Guinea-Hebrides	263	210	10	-	-
12	Fiji-Kermadec	508	230	74	400	74
13	South America	112	210	9	-	-
14	Distance Range 30^{o}-90^{o}	3775	130	286	230	77
15	Distance Range 110^{o}-180^{o}	1195	220	100	380	73

TABLE VI.2.1

Median location difference in km between USGS and NORSAR for the time period Jan 73-Mar 75 (Berteussen et al, 1976) and for Oct 77-Dec 77 (present study), and the increase in percentage.

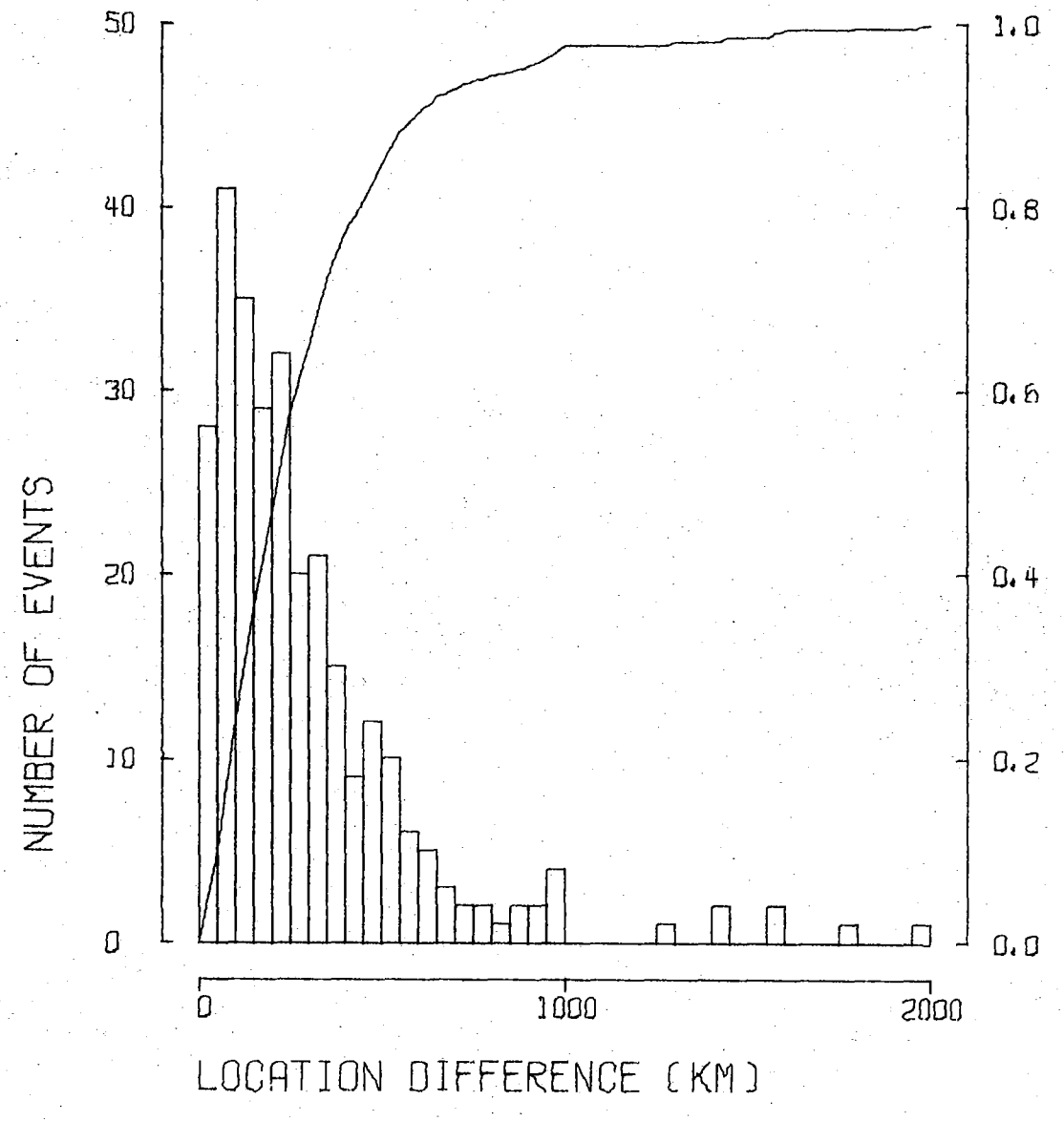


Fig. VI.2.1 Cumulative and incremental distribution of epicenter location differences between USGS and NORSAR for Region 14 (see Table VI.2.1) for the time period Oct 77 - Dec 77.