

MEMORANDUM FOR: Leon L. Beratan, Chief  
Earth Sciences Branch  
Division of Radiation Programs &  
Earth Sciences, RES

Andrew J. Murphy, Section Leader  
Seismology Section  
Earth Sciences Branch  
Division of Radiation Programs &  
Earth Sciences, RES

FROM: Ernst G. Zurflueh, Geophysicist  
Seismology Section  
Earth Sciences Branch  
Division of Radiation Programs &  
Earth Sciences, RES

SUBJECT: SEISMIC NETWORK OPERATIONS AT THE UNIVERSITY OF MICHIGAN

On October 2, 1985, I visited with Dr. Henry Pollack and Mr. Douglas Christensen of the Geophysics Department of the University of Michigan in Ann Arbor to review network operations and related research. The university is operating a seismographic network of 13 stations in western Ohio and Indiana and one station in Michigan under contract to the NRC. The purpose of the network is to monitor seismic activity in the Ohio/Indiana region with particular attention to seismicity in the Anna, Ohio, area and its possible relationship with the New Madrid rift or other structural features.

Correlations with gravity and magnetic maps and other data have shown no compelling reason for postulating a connection between the seismicity of Anna, Ohio, and that of New Madrid, Missouri. On the other hand, it appears that an extension of the Grenville front continues under the mid-continent sediments in a N-S direction through the Anna area.

The university has collected a large amount of data on teleseismic travel time residuals for this array. By taking differences in residuals between one station and the others, it is possible to eliminate variations resulting from earthquake sources, the differences depending only on local crustal conditions. These residual differences show a pattern of high delay times along the western edge of the Anna, Ohio, area which corresponds to the magnetic anomaly pattern and the possible location of the buried Grenville front. There is, however, no direct correlation between the postulated Grenville front and the distribution of seismicity in the area.

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The analysis of travel time residuals is reaching a stage of diminishing returns. Therefore, if any future research is desired above the monitoring functions of the network, an improvement in instrumentation will be needed. This may include upgrading the network with digital recording, 3-component stations and broadband recording. With these options the deeper structure of the lithosphere could be investigated among other things. Dr. Pollack mentioned that it would be advantageous for the department to obtain a new computer because present expenses for computer operations, including maintenance and overhead, are costing about as much as a new computer would.

During the day I also met Drs. Rob Van der Voo, the department Chairman, Thorne Lay and Larry Ruff, members of the seismology staff. Both of these members are interested in investigating the lithosphere by means of seismicity. They are involved in plans for a new global seismic network under IRIS and are envisioning work in imaging lithospheric regions.

*E. Zurflueh*

Ernst G. Zurflueh, Geophysicist  
Seismology Section  
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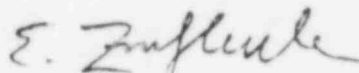
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Leon L. Beratan

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