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UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

CORRELATION OF EPICENTERS WITH MAPPED FAULTS,  
EAST-CENTRAL ALASKA, 1968-1971

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Open-file report

1972

This report is preliminary  
and has not been edited or  
reviewed for conformity with  
Geological Survey standards

OIR 72-12P

## INTRODUCTION

This report presents a mapped compilation of over 1500 earthquakes in east-central Alaska located by the seismograph network of the Geophysical Institute, University of Alaska during the period 1968-1971. It was prepared for the purpose of displaying the spatial distribution of epicenters within east-central Alaska, and indicating the relationship of the resulting pattern with known and inferred faults.

Previously published work regarding the seismicity of this region (Gutenberg and Richter, 1954; Tobin and Sykes, 1966) reflects the fact that prior to 1964, the only seismograph station operating in interior Alaska was the Worldwide Standard Station operated by the U. S. Coast and Geodetic Survey at College, Alaska (COL). Thus only large earthquakes recorded outside the State could be located, and few data were available for the interior. However, by early 1967, Dr. Eduard Berg of the Geophysical Institute, with support from the Air Force Office of Scientific Research and the National Science Foundation, had established a telemetered net of high-gain stations (operating gains were typically on the order of  $1-2 \times 10^6$  at 5 Hz) in central and southern Alaska (Berg et al., 1967) and accurate epicentral locations of small events in Alaska were possible for the first time. Changes have been made in the net since then, but its configuration was essentially as shown in the index map during the time period covered by this report. Additional readings were available routinely from the Palmer tsunami warning network operated by NOAA and, at various times, from temporary recording sites installed by the Geophysical Institute.

indicating that errors in the original epicentral locations were minor.

Because the epicenters obtained for the interior by NOAA/ERL are largely dependent on readings from the present Geophysical Institute net, and are thus subject to the same sort of bias that regional structure anomalies may introduce, the absolute errors in location are probably of the same order of magnitude for both agencies. Thus, when an epicenter is established by NOAA/ERL largely on the basis of readings from the Geophysical Institute net, or when the epicenter lies within the boundaries of that net, the difference between the hypocentral coordinates given by NOAA/ERL and those established by the Geophysical Institute is usually insignificant. However, in the case of an event occurring outside the boundaries of the Geophysical Institute net for which readings at distant stations are available to NOAA/ERL, the divergence between the two computed epicenters can become large (as much as 70 km in the Gulf of Alaska, for instance), and the University of Alaska parameters must be regarded as unreliable.

Some of the events shown on the accompanying map are undoubtedly poorly located small events, recorded by perhaps as few as three stations. However, most of the epicenters shown inside the network (where this is taken to mean that portion of the map between  $144^{\circ}$  and  $152^{\circ}$ , and south of  $66^{\circ}$ ) are probably accurate to within ten kilometers. Significant error can be expected outside these boundaries.

#### MAP COMPILATION

Data concerning the faults shown on the map were compiled and interpreted by one of the authors (F.W.) from published (see Appendix for reference list) and unpublished U. S. Geological Survey maps and reports.

The compilation was prepared on a scale of 1:250,000 so that some loss of detail is to be expected in the transition to the scale of 1:1,000,000 used in this report. Therefore, some of the fault zones are shown only schematically, as for example, the thrust zone north and northwest of Fairbanks. Many faults which have been interpreted as probably older than Cenozoic, and which show no apparent relationship to present seismicity, have also been omitted. In addition, small faults outside the boundaries of the seismograph network, where seismic data is minimal and of poor quality, are not shown.

Epicenters shown on the map were not plotted by computer, so that some inaccuracy is to be expected in individual locations. However, it is unlikely that this could effect the general pattern of seismicity which the map presents.

#### Acknowledgments

Seismic data was acquired under support by the Air Force Office of Scientific Research grants 701-66 and contracts F44620-68-C-0066 and F44620-71-C-0015, by National Science Foundation grants GA-1566, GA-12229, GA-28404 and GJ-3856, and by the State of Alaska.

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Appendix - References to Fault Compilation

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