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TITLE: Seismotectonics and Earthquake Hazard in Interior and Western Alaska

ABSTRACT

The seismicity of Alaska north of 62°N originates, as a result of plate convergence, from the collision of two broad tectonic entities: the subducting Pacific plate and the overriding North American plate. Seismicity in the former defines a continuous NW dipping Benioff zone with the north-eastern most edge just north of 64°N at 140 km depth. The shallow (0 - 30 km) seismicity in the overriding plate is observed over a wide area at distances of several 100 kms from the plate boundaries. Seismic potential in this region is highest in the overriding plate, the historic record since 1904 indicats five events of $Ms \geq 7.0$, the largest ones having magnitude $Ms = 7.3$. The larger historic events ($Ms \geq 6.0$) occur on a west-northwest trend from the Fairbanks area towards the Seward Peninsula. Several clusters and lineaments of seismic activity are observed, especially in areas of good regional seismic network coverage. We have identified a particularily sharp seismic lineament to the southeast of Fairbanks, near Salcha. The relocated epicenter of the 1937, $Ms = 7.3$, earthquake falls onto that lineament. The northeasterly trend of the lineament coincides with the strike of one of the nodal planes of the first motion focal mechanism solution for this event. Several large scale faults such as the Tintina and central Kaltag faults are shown to be seismically active. Most of the seismicity patterns and the focal mechanisms observed throughout the central Alaska region are consistent with a regional NNW compressive stress field. Such a stress field is expected from the direction of plate convergence in southern Alaska.