

Accretionary tectonics, economic resources, intraplate seismicity and reactivation tectonics: The case for deep seismic reflection profiling across Mongolia

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The landlocked country of Mongolia exhibits a unique combination of geological interconnections. Having experienced four M 8.0 or greater earthquakes since 1905, Mongolia represents an outstanding example of the dilemma of modern intraplate tectonics. This seismicity is almost certainly influenced by pre-existing structures, but the relationship between the strike slip tectonics- presumably linked to Indo-Asian convergence -and the earlier accretionary structures which amalgamated the Central Asian Orogenic Belt remain obscure. What controls the lateral and depth extent of rupture, which ultimately limits the magnitude of such earthquakes in the intraplate setting? The geometry of Paleozoic amalgamation at depth remains itself unknown: do compressional structures recognized at the surface extend monotonically into the lower crust/upper mantle, or do they sole listrically into more mobile rheology? What is the relationship, if any, between these structures and the Oyu Tolgoi mineral district? Can the source of heat implied by that mineralization be identified at depth? Considerable insight has already been provided by the SINOPROBE deep reflection profiles that cross the similar tectonic units in China. However, do those correlative structures extend into Mongolia? A systematic series of deep reflection profiles extending from China across Mongolia would directly address these issues of continental evolution, issues which have very direct societal relevance in terms of both strategic resources and seismic hazards.