Updated: 22 June 2004

Lake Edgar Earthquake

Date: <20,000 yr BP
Time (local): -
Time (UTC): -
Latitude: 43.0
Longitude: 146.4

Magnitude: 6.5 - 7.0 (inferred)

Several Quaternary fault scarps have been mapped in Australia during routine geological mapping. One of the most prominent scarps relates to the Lake Edgar Fault in southwest Tasmania. The 30 km long north-south trending scarp occurs within the boundary of the Southwest National Park. The scarp traverses the button grass of the Huon Plains and is notable because faulting resulted in the defeat of westerly flowing drainage and the consequent formation of the fault-bound sag pond of Lake Edgar.

The scarp cuts an alluvial fan of late last glacial age which descends from the mountains to the east. A trench dug at right angles to the scarp revealed a spongy fibrous peat overlying a uniformly thick sandy gravel layer, and exposing the underlying silty fine sand. Classic faulting features include vertical gravel-filled tension cracks in the upthrown block, lenses of sand presumed to be caused by liquefaction, and the fan gravels of the upthrown block transported to the east over the former ground surface along a low angle reverse fault. Like other Quaternary faults in Australia this is clearly a reverse fault. However, the trace appears to steepen with depth to a dip of about 60 degrees - 70 degrees to the west.

The trench exposure demonstrates that the fault offsets the late glacial fluvial fan which suggests that the most recent faulting event occurred less than about 20 000 years ago. However the very youthful morphology of the scarp indicates an even more recent age.

The existence of steeply-dipping fine sandy laminae in the trench near the scarp face and near horizontal laminae away from the scarp face are indicative of an earlier faulting event. An earlier event is also indicated by the amount and variability of the uplift along the fault. Three surveyed cross sections; near the trench, 70 m north of the trench and 500 m south of the trench obtain vertical throws of 2.5m, 4.5 m, and 6.5 m respectively.

Unfortunately C14 dating was inconclusive, the peat is too young for dating and the underlying sand is more than 39 600 years - too old for C14 dating. Further work needs to be done on the Lake Edgar scarp. Other dating techniques such as pollen analysis and Optically Stimulated Luminescence (OSL) dating might be more successful in constraining the age of faulting.

References:

McCue, K., 1990 - Australia's large earthquakes and Recent fault scarps. Journal of Structural Geology, 12, 761-766.
McCue K., Van Dissen R., Gibson G., Jensen V. & Boreham B., 2003. The Lake Edgar Fault: an active fault in Southwestern Tasmania, Australia, with repeated displacement in the Quaternary. Annals of Geophysics, 46(5), 1107-1117.