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Scientific basis for definition of a fault rupture hazard in Franz Josef Glacier, West Coast, New Zealand, and the fight to see use made of this information.

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There is currently around a 30% probability New Zealand's Alpine Fault will accommodate another M~8 earthquake in the next 50 years. The fault passes through Franz Josef Glacier town, a popular tourist destination attracting up to 6,000 visitors per day during peak season. The township straddles the fault, with building stock and infrastructure likely to be affected by at least 8m horizontal and 1.5m vertical ground displacements in this coming event. New Alpine Fault science is presented here that adds to the strong evidence in support of moving the township northward and out of a 200m zone of deformation across the fault zone to mitigate future losses.

In 2011 two shallow boreholes were drilled at Gaunt Creek, as part of the Alpine Fault Drilling Project, DFDP. In cores collected from the deeper of these boreholes (DFDP-1B), two 'principal slip zones (PSZ)' were sampled, indicating the fault is not a simple geometrical structure. Subsequent studies of the recovered cores have demonstrated:

These studies, combined with other recent outcrop studies nearby, highlight that the central Alpine Fault zone is a complex structure comprising multiple PSZ in the near surface, some of which may have been simultaneously active in past earthquakes. The results support previous studies (e.g. lidar mapping of offset Quaternary features) that underpinned definition of an 'avoidance zone' around the fault trace in the town. Sadly, local government has failed to acknowledge this risk in public legislature in a way that adequately protects tourism and community infrastructure, and the >1.3 million visitors passing through the region each year. We will explain other actions consequently taken to build awareness and resilience to this hazard.