APPENDIX 5: TENTATIVELY IDENTIFIED LOCAL FAULTS

A5.1 OUTER RISE FAULTS

Earthquakes on Outer Rise faults were proposed as tsunami sources affecting the Raukumara Peninsula in an EQC report by Power et al. (2008) and commercial studies for Gisborne District Council. These posited a fault capable of earthquakes of M_W ~8.0, sited close to the trench, with an estimated recurrence interval of ~1300 years. Subsequently it has been argued that for such a large slip rate, there should be faults evident in the bathymetry; for this reason the estimated characteristic magnitude was reduced here to M_W 7.8, halving the slip rate. It is suggested here that similar sources may exist along the length of the Hikurangi Trench, but with recurrence intervals that lengthen to the south. These important tsunami sources warrant further study.

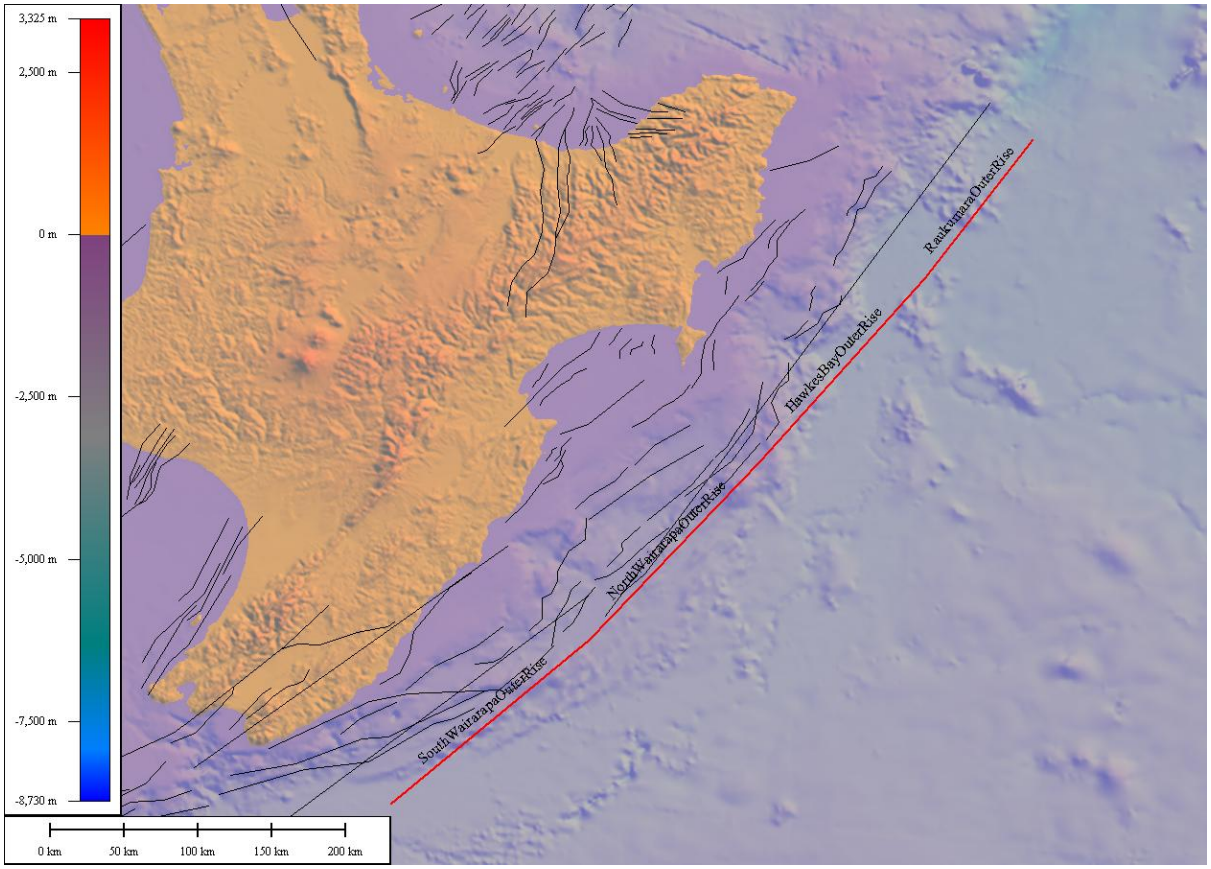

Figure A 5.1 Assumed location of Hikurangi Outer Rise faults as used for this study.

Table A 5.1 Assumed Hikurangi Outer Rise fault properties. Type 'Nn' implies a normal fault mechanism, SR is short for Slip Rate.

Name	Type	Length (km)	Dip	Dip direction	Depth	M_W	Recurrence Interval (years)	SR (mm/yr)
Raukumara Outer Rise	Nn	150	58°	301°	25	7.8	1300	3.5
HawkesBay Outer Rise	Nn	150	58°	305°	25	7.8	1460	3.15
North Wairarapa Outer Rise	Nn	150	58°	305°	25	7.8	1640	2.85
South Wairarapa Outer Rise	Nn	150	58°	311°	25	7.8	1900	2.5

A5.2 TARANAKI BASIN FAULTS

The following faults in the Taranaki Basin are believed to exist and are probably active, but with long recurrence intervals. Parameters are highly uncertain, and most are estimated by extrapolation from properties of onshore faults. The Cape Egmont Fault is already present in the National Seismic Hazard Model, but a non-segmented model was added to indicate the possibility of a larger rupture.

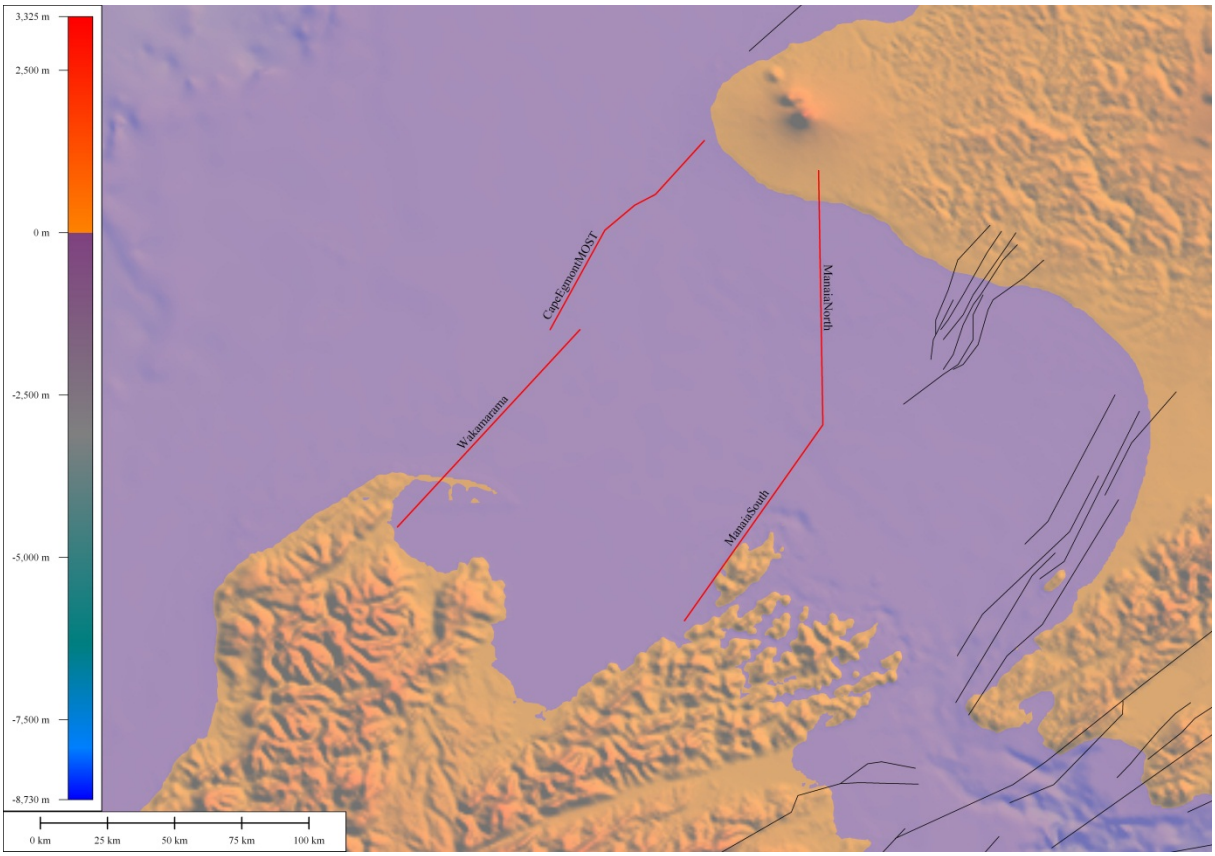

Figure A 5.2 Assumed locations of tentatively identified Taranaki Basin faults.

Table A 5.2 Assumed Taranaki Basin fault properties. Type 'nn' implies a normal fault mechanism, 'rv' a reverse mechanism, 'rs' is combined reverse and strike-slip. SR is short for Slip Rate.

Name	Type	Length (km)	Dip	Dip direction	Depth	M_W	Recurrence Interval (years)	SR (mm/yr)
ManaiaSouth	Rs	83	90°	120°	12	7.2	12000	0.2
ManaiaNorth	Rs	95	90°	90°	12	-	Inactive	Inactive
Wakamarama	Rv	90	45°	305°	12	7.6	30000	0.2
CapeEgmont MOST	Nn	85	60°	295°	12	7.6	20000 (3000)	0.4 (1)

(Numbers in brackets are recurrence interval and slip rate for all ruptures on Cape Egmont Fault. The tsunami hazard model uses only the unbracketed numbers for multi-segment ruptures)

A5.3 OFFSHORE WEST COAST FAULTS

The following faults were tentatively added; they are assumed to accommodate a portion of the dip-slip component of movement along the plate boundary convergence. The Alpine Fault accommodates the strike-slip movement and some portion of the dip slip. Indirect evidence for these faults comes from marine terraces along the West Coast.

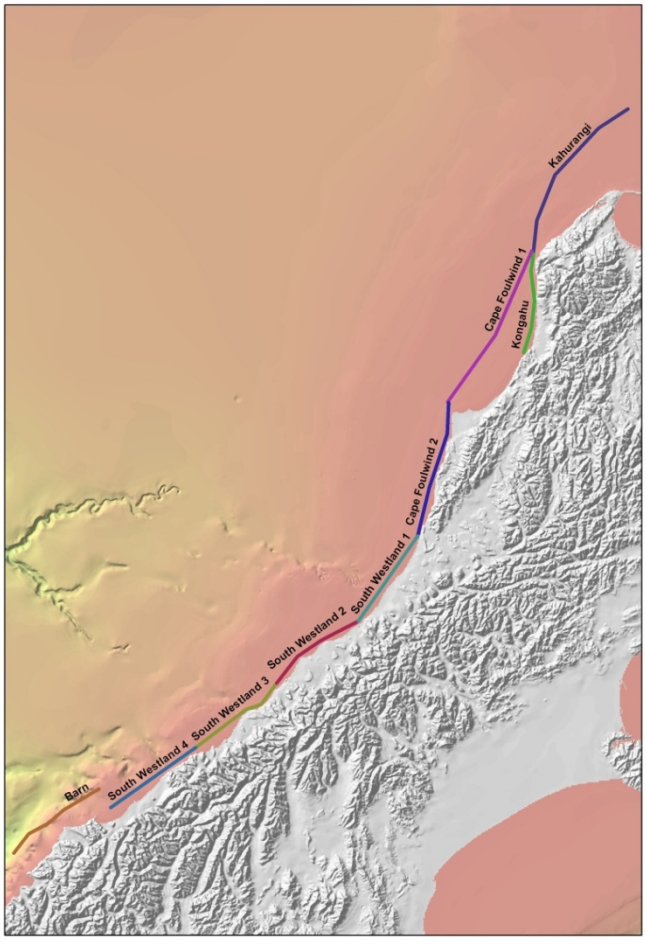

Figure A 5.3 Assumed locations of west coast South Island faults.

Table A 5.3 Assumed west coast South Island fault properties. Type 'rv' implies a reverse fault mechanism, SR is short for Slip Rate

Name	Type	Length (km)	Dip	Dip direction	Depth	M_w	Recurrence Interval (years)	SR (mm/yr)
Barn	Rv	68	25°	143°	15	7.6	2400	2
SouthWestland1	Rv	65	25°	150°	15	7.6	4900	1
SouthWestland2	Rv	65	25°	140°	15	7.6	4900	1
SouthWestland3	Rv	67	25°	143°	15	7.6	4900	1
SouthWestland4	Rv	65	25°	126°	15	7.6	9700	0.5
CapeFoulwind1	Rv	109	25°	105°	15	7.6	9700	0.5
CapeFoulwind2	Rv	86	25°	139°	15	7.6	9700	0.5
Kongahu	Rv	63	25°	93°	15	7.6	15000	0.3
Kahurangi	Rv	112	25°	138°	15	7.6	15000	0.3