

30 Kauri Point

30.1 Site description

Kauri Point is located at the northern end of Tauranga Harbour, approximately 4 km south of the harbour entrance. The site consists of approximately 1.6 km of consolidated cliff. The site is split into 3 cells based on differences in exposure and shoreline elevation (Figure 30-1).



Figure 30-1 Location and cell extent around Kauri Point within Tauranga Harbour.

The cliffs at the southern end of Kauri Point range in elevation from RL 25 to 33 m (Cell 30A). The cliffs face south and are exposed to a maximum fetch of 14 km from southeast. Large pohutukawa trees overhang most of the cliffs and there is evidence of large slips.

Further north the cliffs wrap around to an east-facing orientation (Cell 30B). The cliffs are also densely vegetated with large overhanging pohutukawa trees and there is evidence of some slips occurring.

At the northern end of the shoreline the cliffs face northeast and are slightly reduced in elevation, ranging from RL 7 to 24 m (Cell 30C).

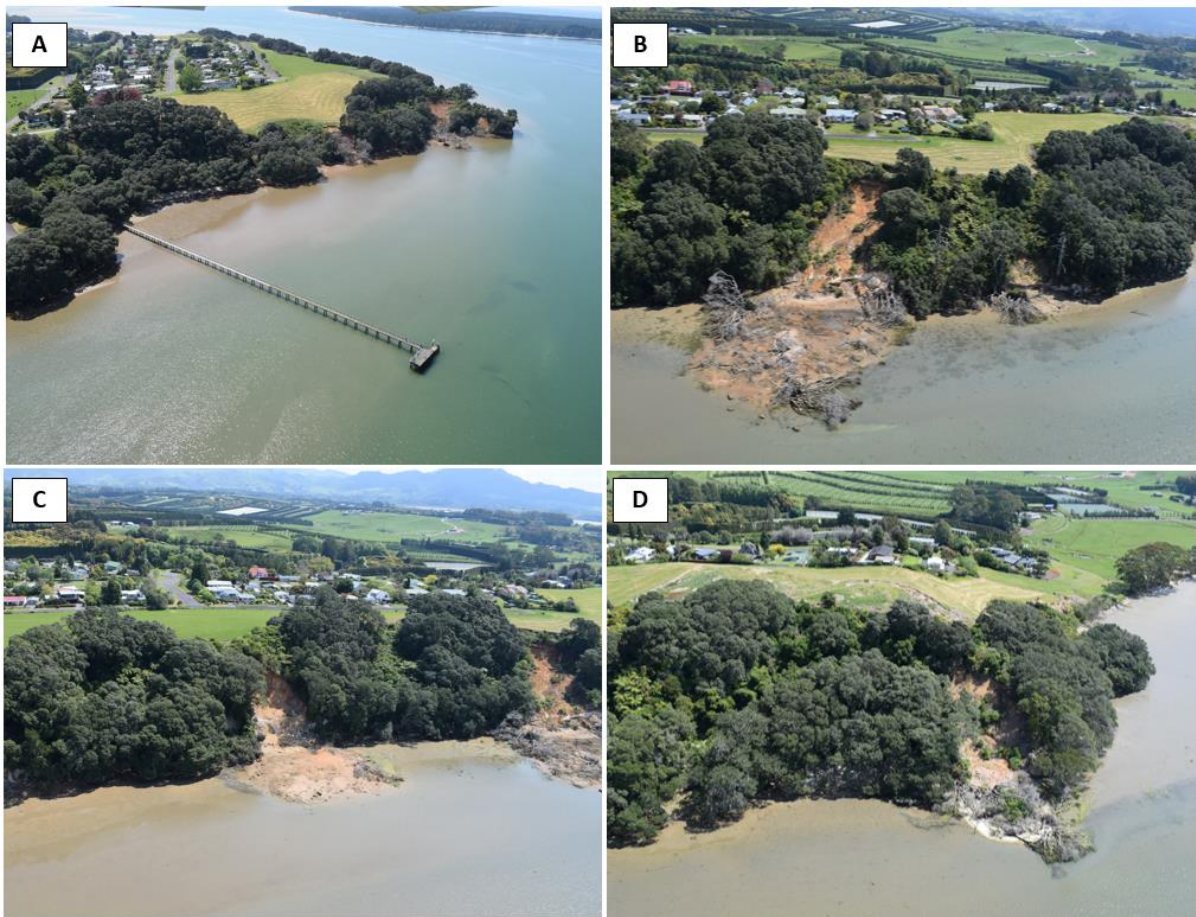


Figure 30-2 Site photos for Kauri Point. (A) South-facing cliffs (Cell 30A). (B) Large slip within Cell 30A). (C) East-facing cliffs (Cell 30B). (D) Northern end of Kauri Point (Cell 30B and 30C).

30.2 Geology

The geological map of the area³¹ indicates that the site comprises:

- Matua Subgroup: Poorly to moderately sorted gravel with minor sand and silt underlying terraces; includes minor fan deposits and loess.

The existing slope angles in this area are between 25° to 50°. The range of stable slope angles for Kauri Point are shown in Table 30-1 below.

The failure types observed around Kauri Point were typically shallow surface failures. The likelihood of deep seated movement is low to moderate.

30.3 Coastal processes

The Kauri Point shoreline is relatively exposed to coastal processes, including wind-waves and tidal currents. Due to extensive tree cover it is difficult to determine the long term erosion rates, however field observations indicate the cliffs are actively eroding. Based on sites with similar exposure the long term erosion rates around Kauri Point are estimated to range from -0.05 to -0.2 m/yr.

³¹ Leonard, G.S.; Begg, J.G.; Wilson, C.J.N. (compilers) 2010: *Geology of the Rotorua area*. Institute of Geological & Nuclear Sciences 1:250,000 geological map 5. 1 sheet + 102 p. Lower Hutt, New Zealand. GNS Science.

The combination of strong tidal currents and wind-waves generated from the large southerly fetch are likely to contribute to undercutting of the cliff toe, with the tidal currents contributing to the removal of slip debris.

Based on the large fetch exposure within Cell 30A the SLR response factor is estimated to range from 0.3 to 0.5. As cells 30B and 30C have a slightly smaller fetch exposure, the SLR response factor is estimated to range from 0.2 to 0.4.

30.4 Adopted component values

Adopted component values are presented within Table 30-1. The short term values are equal to zero for the consolidated cells as short term erosion is not applicable for consolidated shorelines (see section 4.6.2 in main report).

Table 30-1 Component values for cells along Kauri Point.

Site		30. Kauri Point		
Cell		30A	30B	30C
Cell centre (NZTM)	E	1863007	1863134	1862952
	N	5843793	5844251	5844727
Morphology		Consolidated	Consolidated	Consolidated
Geology		Matua Subgroup	Matua Subgroup	Matua Subgroup
Exposure (average fetch/direction)		14 km (SE)	2 km (east)	4.5 km (NE)
State		Natural	Natural	Natural
Short-term (m)	Min	0	0	0
	Mode	0	0	0
	Max	0	0	0
Dune/Cliff elevation (m above toe or scarp)	Min	25	30	6
	Mode	30	33	7
	Max	33	35	10
Stable angle (deg)	Min	24	24	24
	Mode	26	26	26
	Max	50	50	45
Long-term (m)	Min	-0.2	-0.2	-0.2
	Mode	-0.15	-0.15	-0.15
	Max	-0.05	-0.05	-0.05
Closure slope (beaches)/SLR response factor (cliffs)	Min	0.3	0.2	0.2
	Mode	0.4	0.3	0.3
	Max	0.5	0.4	0.4

30.5 Coastal erosion hazard assessment

Coastal erosion hazard distances for Kauri Point are presented within Table 30-2 and an overview map in Figure 30-4. Histograms of individual components and resultant erosion hazard distances using a Monte Carlo technique are shown in Appendix B. For the purpose of this assessment all coastal erosion protection structures have been ignored (refer to main report Section 4.5.4).

The current P_{66%} erosion hazard ranges from -13 m along the lower cliffs within Cell 30C to -45 m within the high cliffs in Cell 30B. The future P_{5%} erosion hazard for 1.6 m SLR in 2130 ranges from -45 m in Cell 30C to -100 m along the exposed cliffs in Cell 30A.

Table 30-2 Coastal erosion hazard widths (m) for current, 2080 and 2130 timeframes.

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance						
				Min	P _{66%}	P _{50%}	P _{5%}	P _{1%}	Max	
Kauri Point	30A	Current	0.03	-24	-40	-45	-63	-68	-75	
		50yr (2080)	0.12	-27	-47	-52	-70	-75	-82	
			0.2	-28	-49	-54	-72	-77	-85	
			0.4	-29	-52	-57	-76	-81	-89	
			0.6	-30	-54	-60	-79	-84	-92	
		100yr (2130)	0.22	-29	-54	-59	-78	-83	-90	
			0.6	-33	-61	-66	-87	-92	-101	
			0.8	-34	-64	-69	-90	-96	-106	
			1.25	-35	-69	-74	-96	-103	-115	
			1.6	-36	-72	-78	-100	-108	-121	
		30B	Current	0.03	-28	-45	-51	-70	-74	-79
			50yr (2080)	0.12	-31	-51	-57	-77	-81	-86
				0.2	-32	-53	-58	-78	-83	-88
				0.4	-33	-55	-61	-81	-86	-92
	0.6			-34	-57	-62	-83	-88	-94	
	100yr (2130)		0.22	-35	-58	-64	-84	-90	-96	
			0.6	-37	-63	-69	-90	-96	-104	
			0.8	-38	-65	-71	-93	-99	-108	
			1.25	-39	-69	-74	-97	-103	-113	
			1.6	-39	-70	-76	-99	-106	-116	
	30C		Current	0.03	-7	-13	-14	-19	-21	-24
			50yr (2080)	0.12	-11	-20	-21	-27	-29	-33
				0.2	-11	-21	-22	-28	-31	-35
				0.4	-13	-23	-25	-31	-34	-39
		0.6		-14	-25	-26	-34	-36	-42	
		100yr (2130)	0.22	-14	-26	-28	-35	-38	-42	
			0.6	-16	-31	-33	-42	-45	-51	

Site	Cell	Timeframe	SLR (m)	Probability of Exceedance					
				Min	P _{66%}	P _{50%}	P _{5%}	P _{1%}	Max
			0.8	-17	-33	-35	-45	-48	-54
			1.25	-18	-35	-39	-49	-53	-60
			1.6	-19	-37	-41	-52	-57	-64

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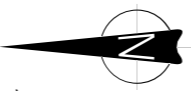
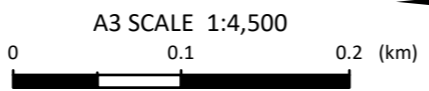


LEGEND

- Cell Extent
- Baseline (2014-2017)
- No current erosion (refer to future MHWS)
- Critical structures
- 2030 (current) - P66%
- 2030 (current) - P5%
- 2080 - 0.4m SLR - P66%
- 2080 - 0.6m SLR - P66%
- 2080 - 0.6m SLR - P5%
- 2130 - 0.8m SLR - P66%
- 2130 - 1.25m SLR - P66%
- 2130 - 1.25m SLR - P5%
- 2130 - 1.6m SLR - P5%
- Future MHWS7 - 1.6m SLR

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Notes: Aerial photograph sourced from the LINZ Data Service (dated 2015)



Tonkin+Taylor
 105 Carlton Gore Rd, Newmarket, Auckland
 www.tonkintaylor.co.nz

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ARCFILE CEHA Overview2.mxd		
SCALE (AT A3 SIZE) 1:4,500		
PROJECT No. 1001628.1000		

Tauranga Harbour Coastal Erosion Assessment
 Erosion Hazard Overview
 Site 30: Kauri Point

FIGURE No. Figure 30-4

Rev. 0