

25 Coopers Beach

Description and geomorphology

Coopers Beach is located at the southern end of Doubtless Bay, approximately 26 km east of Kaitia.

The site is approximately 2 km long north facing embayment situated between Te Homamu Point in the west and Rangikapiti Point in the east. The headlands are relatively erosion resistant basalt marine lavas known as Tangihua Volcanics.

The fine sand beach has a relatively flat slope with a wide intertidal area. The beach is backed by cliffs with no foredune system protecting the toe of the cliff. The cliff material is relatively weathered and weak sedimentary rock comprising conglomerates, claystone, siltstone and sandstone (Mangonui Formation). The cliff crest elevation ranges from RL 2.5 to 16 m.

Areas of slumping and landslides are apparent along the site with weathered soils flowing down to the shoreline prone to erosion. Coastal processes are also undercutting the cliff toe causing instability over time.

The Kanenane and Otanenui Stream mouths are located approximately 200 m and 600 m from the western end of the site respectively. They have a localised effect on shoreline position in these areas.

Local considerations

Erosion protection structures exist along the toe of the cliff east of Kanekane Stream. The structures range from loose rock revetments to timber seawalls. There are also a number of stormwater outlets located at the base on the cliff. These structures can result in lowering the adjacent foreshore level causing more wave induced erosion at the toe of the cliff. A boat ramp is situated at the eastern end of the site.

There are two streams that enter the site and influence the shoreline position. There is a greater level of uncertainty in these areas because fluvial processes also effect shoreline movement. The resulting hazard zones are dashed in these areas to reflect this uncertainty.



Site Photograph A (looking east)



Site Photograph B (conglomerate rock)



Site Photograph C (western end)

Coastal Erosion Hazard Assessment

The site is split into seven cells based on differences in geomorphology, exposure and bank height.

Adopted component values are presented within Table 25-1. Long-term erosion rates range from -

0.02 to -0.1 m/year at the western end to -0.05 to -0.15 m/year at the eastern end.

The cliff projection method has been adopted for all cells, with future shoreline distances shown in Figure 25-1 to Figure 25-7 and in Table 25-2 instead of CEHZ distances.

The future shoreline (cliff toe) distances range from 4 to 8 m to 2065 and 20 to 32 m to 2115.

CEHZ's have been mapped in agreement with the calculated values, although lines have been dashed around stream entrances to reflect the increased uncertainty due to fluvial processes.

Figure 25-9 shows the available historic shorelines for Coopers Beach.

Table 25-1 Component values for Erosion Hazard Assessment

Site		25. Coopers						
Cell		25A ¹	25B ¹	25C ¹	25D ¹	25E ¹	25F ¹	25G ¹
Cell centre (NZTM)	E	1646074	1646232	1646415	1646645	1647086	1647483	
	N	6128021	6127942	6127934	6127944	6128040	6128331	
Chainage, m (from N/W)		0-300	300-430	430-680	680-900	900-1660	1660-2060	2060-2160
Morphology		Mangonui Formation mudstones and conglomerates						
Short-term (m)	Min	0	0	0	0	0	0	0
	Mode	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0
Dune/Cliff elevation (m above toe or scarp)	Min	9.3	7.0	9.1	2.5	10.0	3.8	8.4
	Mode	10.3	8.7	10.0	9.0	12.6	5.7	12.2
	Max	12.0	10.8	11.1	11.9	15.9	7.9	14.6
Stable angle (deg)	Min	26.6	26.6	26.6	26.6	18.4	18.4	18.4
	Mode	30.2	30.2	30.2	30.2	22.5	22.5	22.5
	Max	33.7	33.7	33.7	33.7	26.6	26.6	26.6
Long-term (m) -ve erosion +ve accretion	Min	-0.02	-0.02	-0.02	-0.02	-0.05	-0.05	-0.05
	Mode	-0.05	-0.05	-0.05	-0.05	-0.1	-0.1	-0.1
	Max	-0.1	-0.1	-0.1	-0.1	-0.15	-0.15	-0.15
Closure slope (beaches)	Min	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Mode	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Max	0.25	0.25	0.25	0.25	0.25	0.25	0.25
SLR 2065 (m)	Min	0.19	0.19	0.19	0.19	0.19	0.19	0.19
	Mode	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	Max	0.39	0.39	0.39	0.39	0.39	0.39	0.39
SLR 2115 (m)	Min	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	Mode	0.77	0.77	0.77	0.77	0.77	0.77	0.77
	Max	1.1	1.1	1.1	1.1	1.1	1.1	1.1

¹Updated using cliff projection methodology

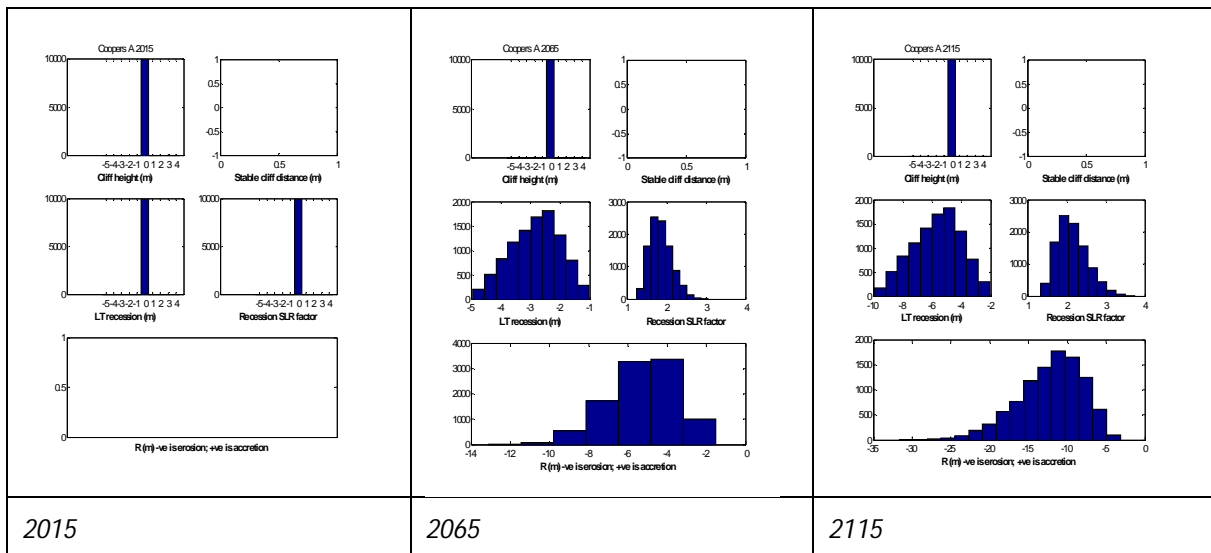


Figure 25-1 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25A

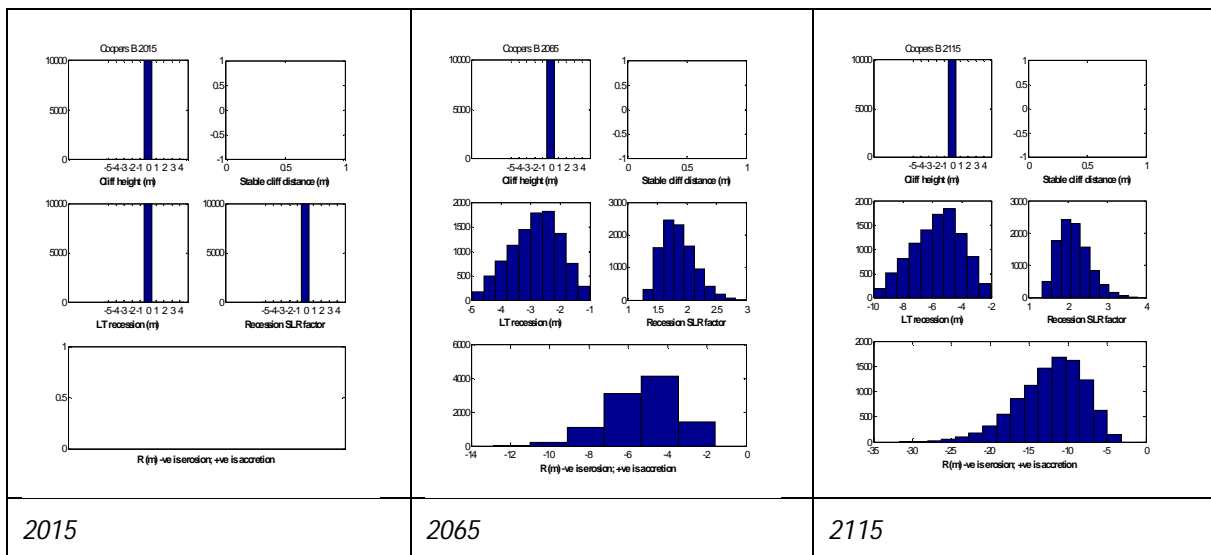


Figure 25-2 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25B

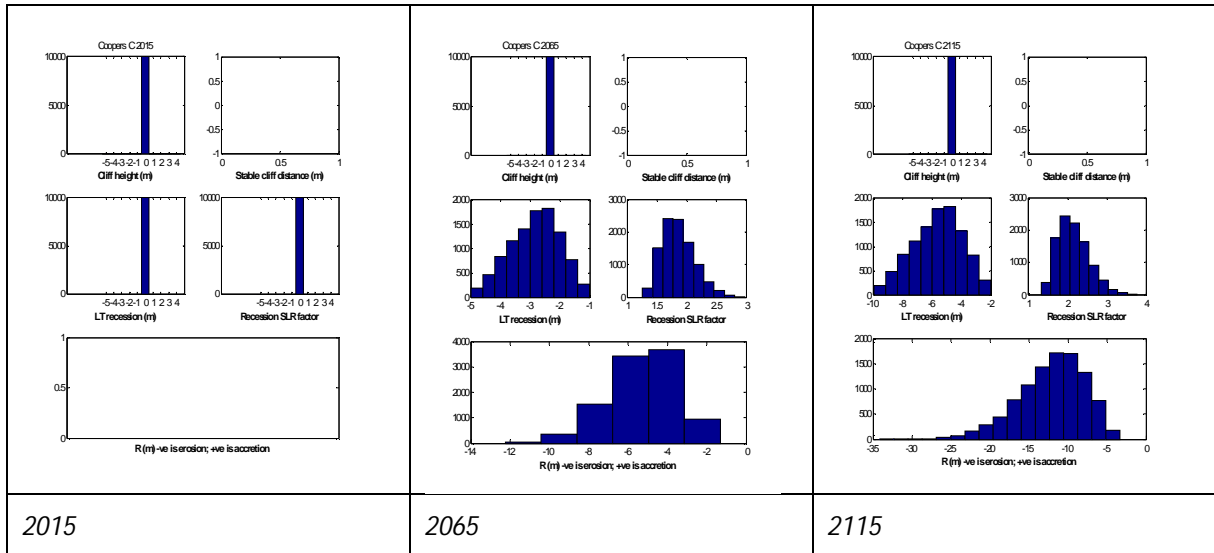


Figure 25-3 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25C

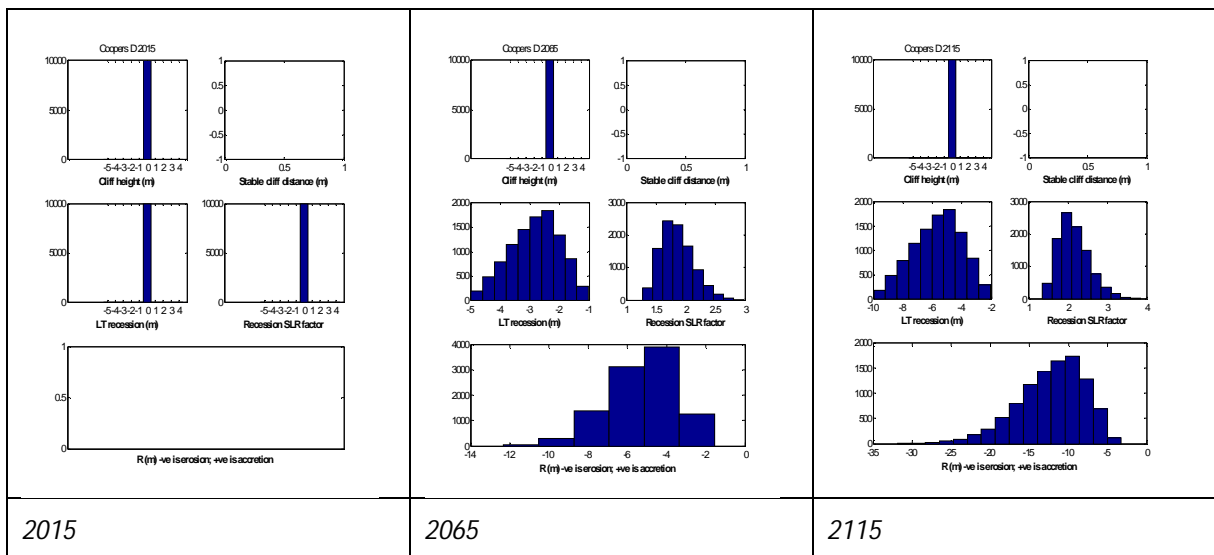


Figure 25-4 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25D

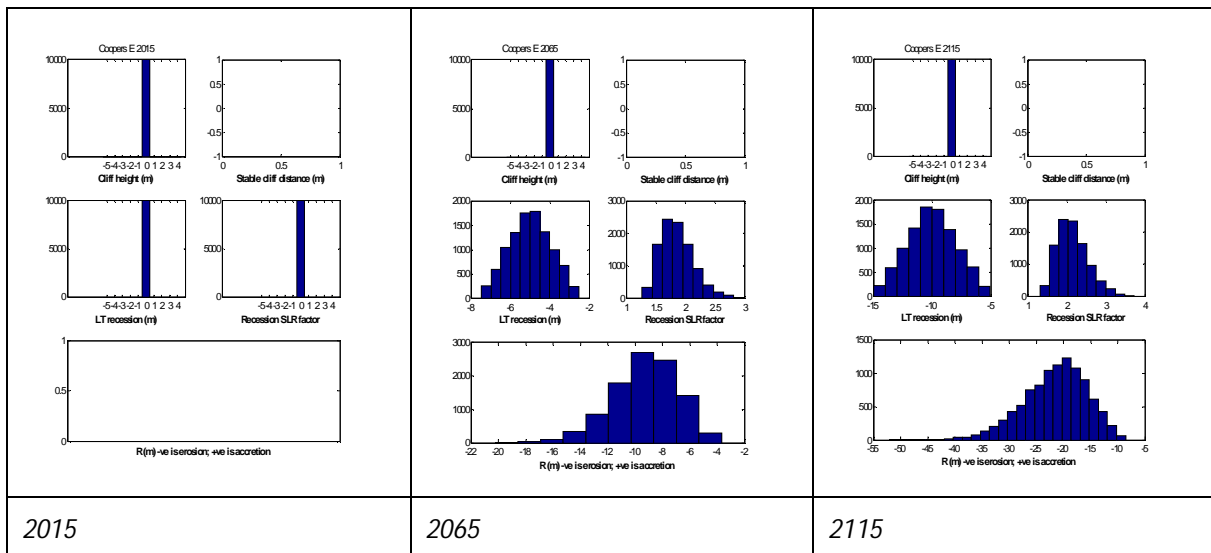


Figure 25-5 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25E

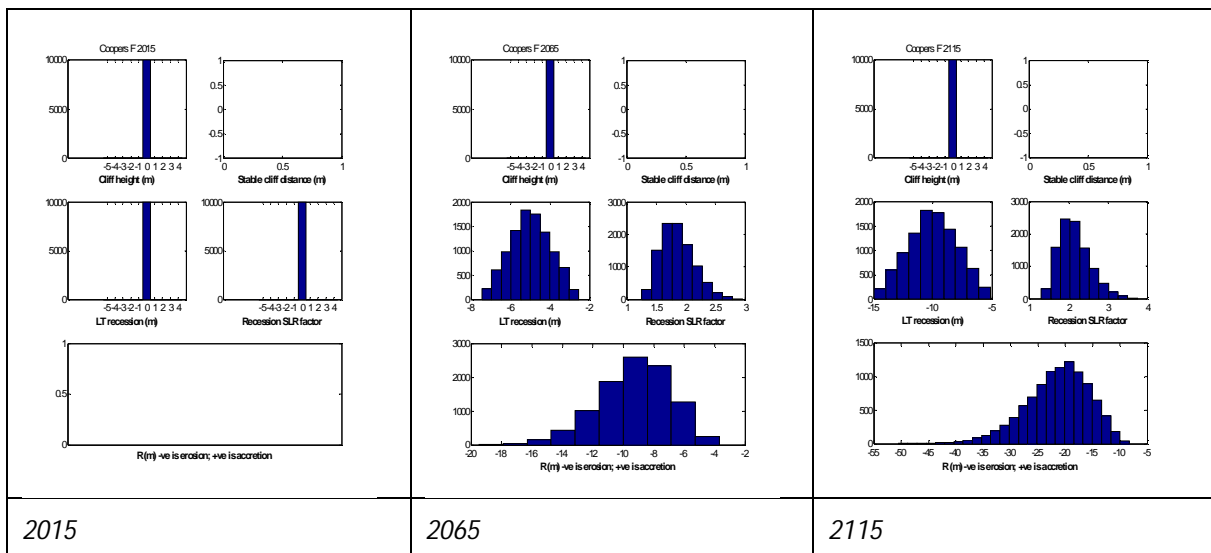


Figure 25-6 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25F

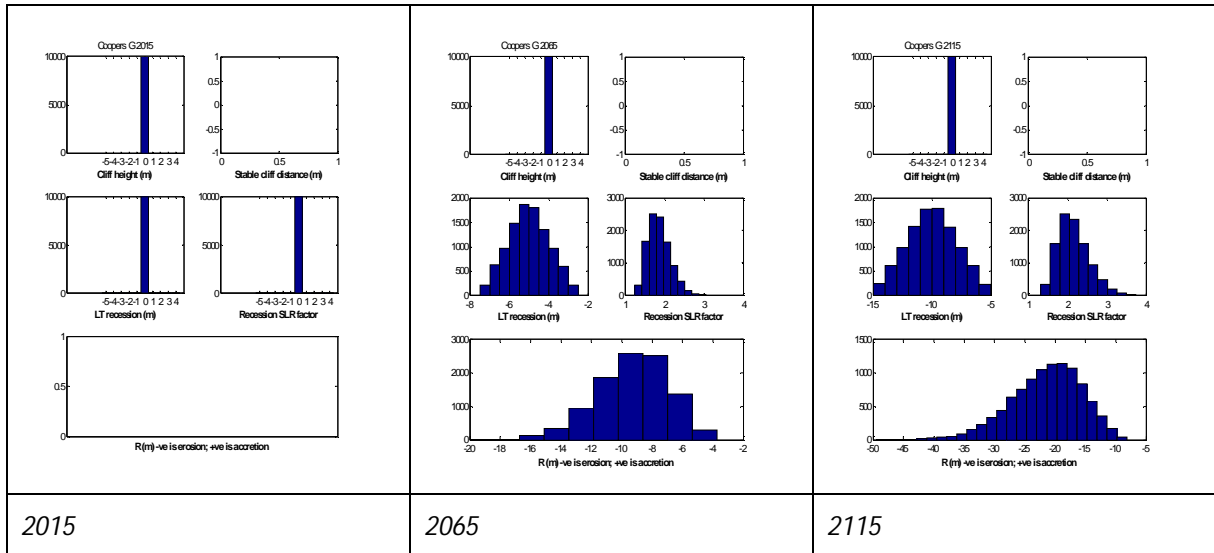


Figure 25-7 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 25G

Table 25-2 Coastal Erosion Hazard Zone Widths

Site		25. Coopers																				
Cell		25A			25B			25C			25D			25E			25F			25G		
Time		2015	2065	2115	2015	2065	2115	2015	2065	2115	2015	2065	2115	2015	2065	2115	2015	2065	2115	2015	2065	2115
Probability of CEHZ (m) Exceedance	Min	0	-2	-3	0	-2	-3	0	-1	-3	0	-2	-3	0	-4	-9	0	-4	-8	0	-4	-8
	99%	0	-2	-5	0	-2	-5	0	-2	-5	0	-2	-5	0	-5	-11	0	-5	-11	0	-5	-11
	95%	0	-3	-6	0	-3	-6	0	-3	-6	0	-3	-6	0	-6	-13	0	-6	-13	0	-6	-13
	90%	0	-3	-7	0	-3	-7	0	-3	-7	0	-3	-7	0	-6	-14	0	-6	-14	0	-6	-14
	80%	0	-4	-9	0	-4	-9	0	-4	-8	0	-4	-9	0	-7	-17	0	-7	-16	0	-7	-16
	70%	0	-4	-10	0	-4	-10	0	-4	-10	0	-4	-10	0	-8	-18	0	-8	-18	0	-8	-18
	66%	0	-4	-10	0	-4	-10	0	-4	-10	0	-4	-10	0	-8	-19	0	-8	-19	0	-8	-19
	60%	0	-5	-11	0	-5	-11	0	-5	-11	0	-5	-11	0	-9	-20	0	-9	-20	0	-9	-19
	50%	0	-5	-12	0	-5	-12	0	-5	-12	0	-5	-12	0	-9	-21	0	-9	-21	0	-9	-21
	40%	0	-6	-13	0	-6	-13	0	-6	-13	0	-6	-13	0	-10	-23	0	-10	-22	0	-10	-23
	33%	0	-6	-14	0	-6	-14	0	-6	-14	0	-6	-14	0	-10	-24	0	-10	-24	0	-10	-24
	30%	0	-6	-14	0	-6	-14	0	-6	-14	0	-6	-14	0	-10	-24	0	-10	-24	0	-10	-24
	20%	0	-7	-16	0	-7	-16	0	-7	-16	0	-7	-16	0	-11	-26	0	-11	-26	0	-11	-26
	10%	0	-8	-18	0	-8	-18	0	-8	-18	0	-8	-18	0	-12	-30	0	-12	-29	0	-12	-29
	5%	0	-8	-20	0	-8	-20	0	-8	-20	0	-8	-20	0	-14	-32	0	-13	-32	0	-13	-32
	1%	0	-10	-24	0	-10	-24	0	-10	-24	0	-10	-24	0	-16	-38	0	-15	-38	0	-16	-37
	Max	0	-13	-32	0	-13	-32	0	-12	-34	0	-12	-32	0	-20	-52	0	-19	-50	0	-20	-49
	CEHZ1		-4*			-4*			-4*			-4*			-8*			-8*			-8*	
CEHZ2		-20*			-20*			-20*			-20*			-32*			-32*			-32*		

*Updated using cliff projection methodology, so distance to future cliff toe position has been tabulated. Actual CEHZ width will be greater depending on cliff height and stable slope angle.

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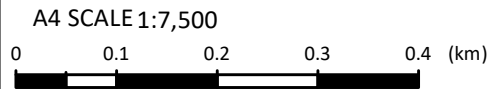
LEGEND

- 2013 - 2014 shoreline
- Erosion Protection Structures
- ↔ Cell Extent

Coastal Erosion Hazard Zone

- CEHZ0 (protected by structure)
- CEHZ1 (2065 CEHZ)
- CEHZ2 (2115 CEHZ)

Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography. Northland 0.1m Rural Aerial Photos (2014-2015).



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DRAWN	PPK	Dec.17
CHECKED	TDS	Dec.17
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ARCFILE 1001049-000-CEHZ001.mxd		
SCALE (AT A4 SIZE) 1:7,500		
PROJECT No. 1001049		

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 Coastal Erosion Hazard Assessment
 Coopers Beach
 Site: 25

FIGURE No. **Figure 25-8**

Rev. **2**

Path: P:\1001049\WorkingMaterial\GIS\FINAL\HistoricShorelines.mxd Date: 4/10/2017 Time: 3:08:04 PM



Source: Esri, DigitalGlobe, GeoEye, IGN, and the GIS User Community

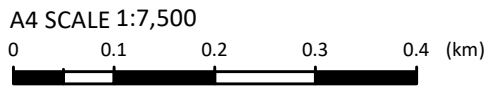
Legend

←→ Cell Extent

Shorelines

- 2014 baseline
- 14/01/2014
- 18/06/2002
- 28/10/1981
- 15/06/1966
- 02/05/1966
- 09/04/1948

Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography. Northland 0.1m Rural Aerial Photos (2014-2015).



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ARCFIELD HistoricShorelines.mxd		
SCALE (AT A4 SIZE) 1:7,500		
PROJECT No. 1001049		

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 Site: 25

FIGURE No. Figure 25-9

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