

17 Oakura

Description and geomorphology

Oakura Bay is located on the Northland east coast at the entrance to Whangaruru Harbour approximately 40 km north of Whangarei.

The site is a pocket beach embayment situated between the two headlands of Okiore Point in the north and Otororewa Point in the south. Okiore Point forms a reef structure that extends approximately 500 m offshore, which provides some shelter to the northern end of the bay from wind waves and currents. Another rocky reef is situated near the centre of the bay which extends approximately 200 m offshore.

The site has a sandy beach that comprises medium to coarse sand and shell material. The central section of the beach has a 5 to 15 m wide berm above the high tide line. The widest berm width is located in the lee of the central reef which has formed a salient. The beach has no high tide berm at both the northern and southern 250 m end sections of the bay.

The central beach section has a typical profile that transitions from a grass bank down to the berm with a bank scarp of less than 1 m. There is currently no dune system with a grass reserve that extends down to the erosion scarp at the back of the berm.

The backshore elevation is relatively low lying ranging from RL 3 m to 5 m RL and comprises loose sand, gravel and shell Holocene deposits.

The Oakura Stream discharges onto the beach at the southern end of the bay. The stream is forced along the right hand bank by the spit. This section of the right hand bank is protected by a rock backfilled timber post and rail seawall.

The topography rises up to a headland on the southern side of the stream, with approximately 130 m of cliff shoreline comprising Greywacke and argillite.

Local considerations

A rock revetment exists along the northern 100 m of the site. The Oakura Stream influences the shoreline position and there is a greater level of uncertainty in this areas because of fluvial



Site Photograph A (northern end)



Site Photograph B (southern end)



Site Photograph C (southern end - cliff)

processes. The resulting hazard zones are dashed in these areas to reflect this uncertainty.

Coastal Erosion Hazard Assessment

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

Adopted component values are presented within Table 17-1. Short-term erosion values range from 4 to 10 m in the north and 5 to 15 m in the south. Long-term trends are most variable at the northern end (-0.25 to +0.2 m/year) reducing at the southern end (-0.1 to +0.1 m/year) with cliff erosion rates of between -0.02 and -0.15 m/year.

Histograms of individual components and resultant CEHZ distances using a Monte Carlo technique are shown in Figure 17-1 to figure 17-7.

Coastal Erosion Hazard Zone widths are presented within Table 17-2 and Figure 17-8. CEHZ1 values range from 25 to 28 m for beaches and 10 to 23 m for cliffs and CEHZ2 value from 71 to 76 m for beaches and 25 to 37 m for cliffs CEHZ's have been mapped in agreement with the calculated values.

Figure 17-9 shows the available historic shorelines for Oakura.

Table 17-1 Component values for Erosion Hazard Assessment

Site		17. Oakura						
Cell		17A ⁴	17B	17BB	17C	17D	17E	17F
Cell centre (NZTM)	E	1722391	1722202	1722110	1722128	1722318	1722480	1722604
	N	6083651	6083465	6083239	6082888	6082572	6082460	6082485
Chainage (from N/W)		0-100	100-550	550-740	740-1210	1210-1580	1580-1720	1720-1830
Morphology		Dune	Dune	Dune	Dune	Dune	Holocene Soft Cliff	Greywacke
Short-term (m)	Min	4	4	5	5	5	-	-
	Mode	7	7	10	10	10	-	-
	Max	10	10	15	15	15	-	-
Dune/Cliff elevation (m above toe or scarp) Hb	Min	2.0	3.0	3.0	3.8	2.8	2.2	15.0
	Mode	2.4	3.5	3.5	4.2	3.7	2.9	17.0
	Max	3.8	4.4	4.4	4.5	4.4	4.1	20.0
Stable Angle (deg)	Min	30	30	30	30	30	26.6	26.6
	Mode	32	32	32	32	32	30.1	33.7
	Max	34	34	34	34	34	33.7	45.0
Long-term (m) -ve erosion +ve accretion	Min	0.20	0.20	0.10	0.10	0.10	-0.02	-0.02
	Mode	-0.05	-0.05	0.00	0.00	0.00	-0.05	-0.05
	Max	-0.25	-0.25	-0.10	-0.10	-0.10	-0.10	-0.15
Closure Slope (beaches) / Sea Level Factor (cliffs)	Min	0.032	0.032	0.032	0.032	0.032	0.25	0
	Mode	0.025	0.025	0.027	0.027	0.02	0.5	0.25
	Max	0.018	0.018	0.02	0.02	0.01	0.75	0.5
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

⁴Has been mapped in addition to T+T (2014).

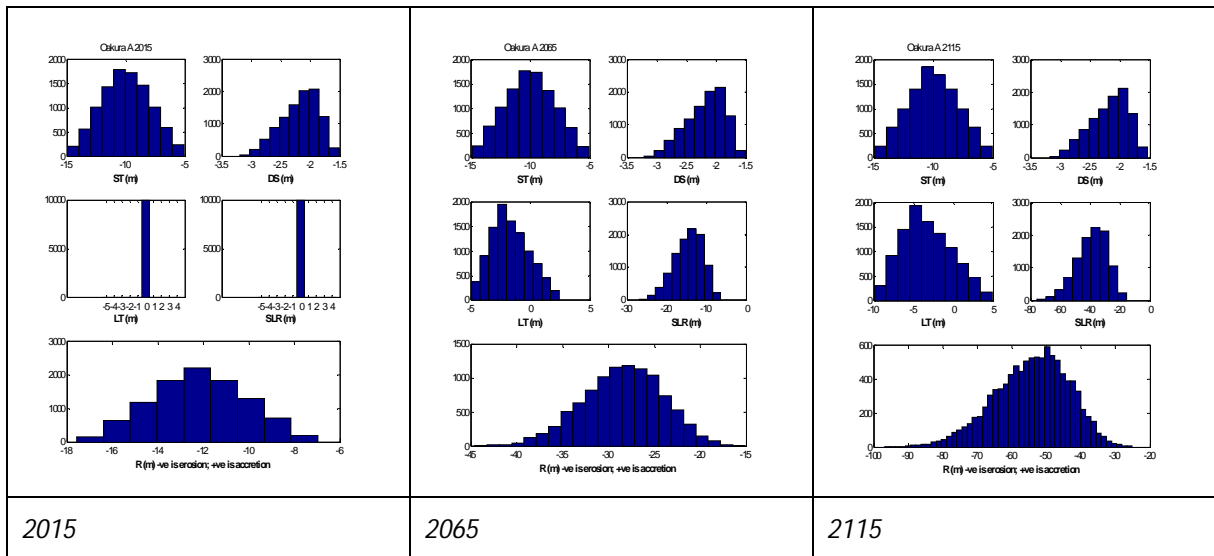


Figure 17-1 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17A

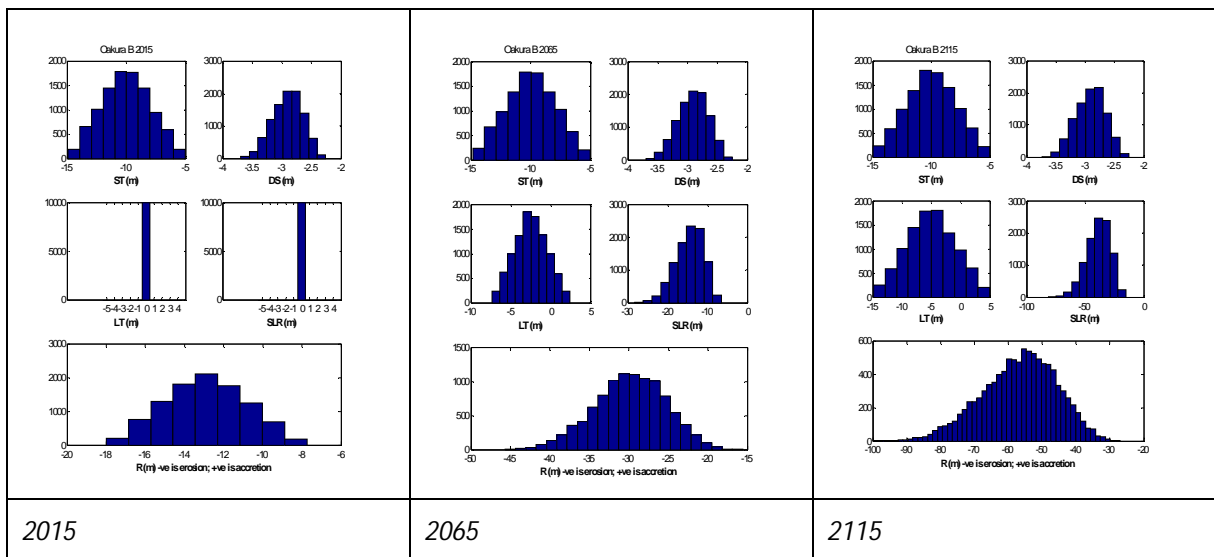


Figure 17-2 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17B

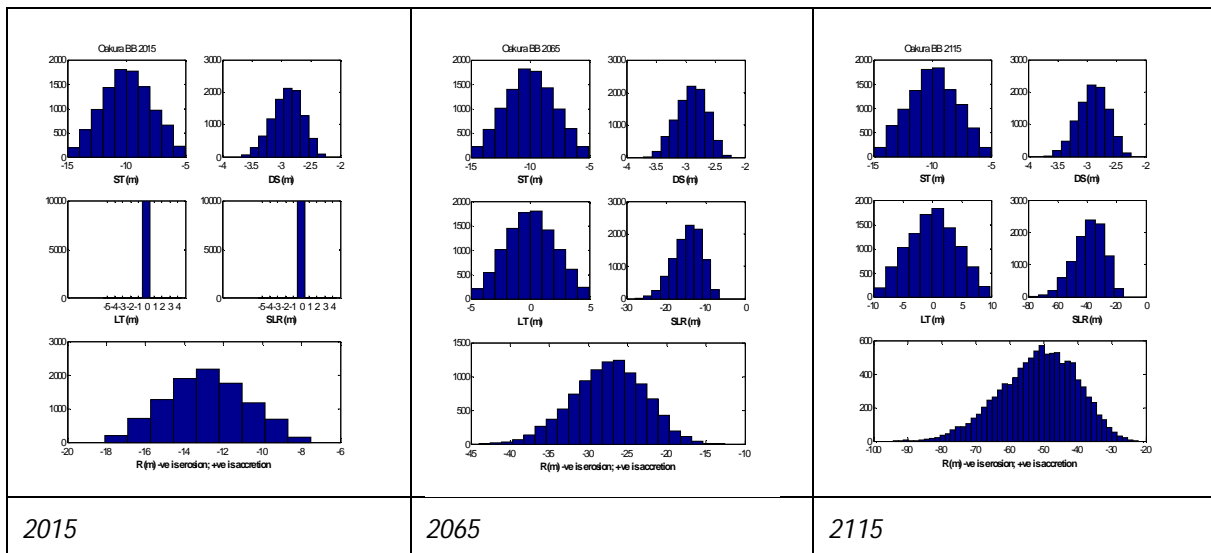


Figure 17-3 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17BB

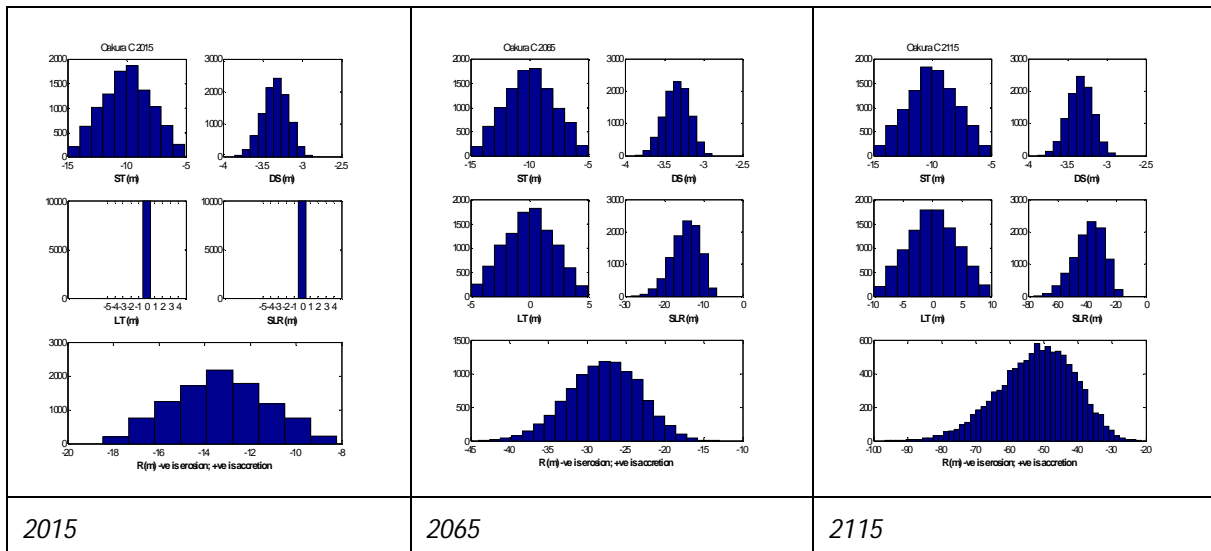


Figure 17-4 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17C

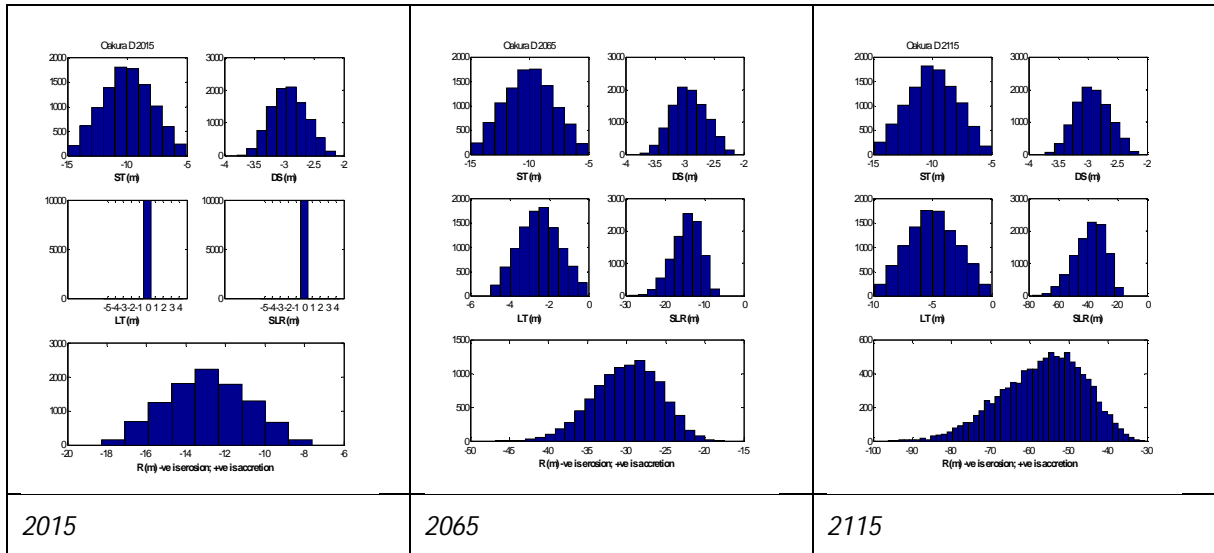


Figure 17-5 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17D

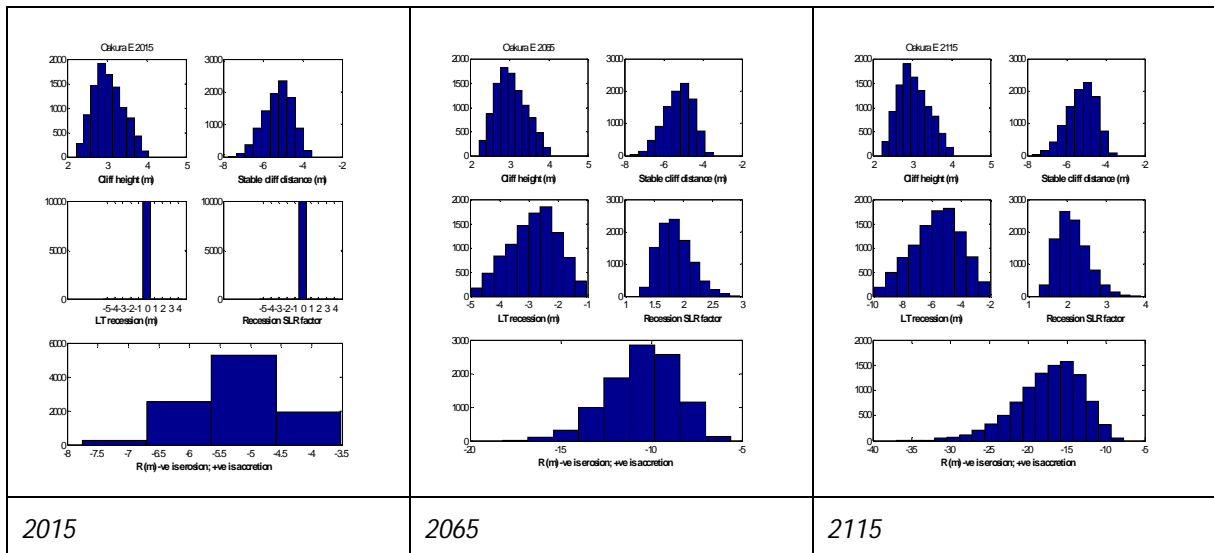


Figure 17-6 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17E

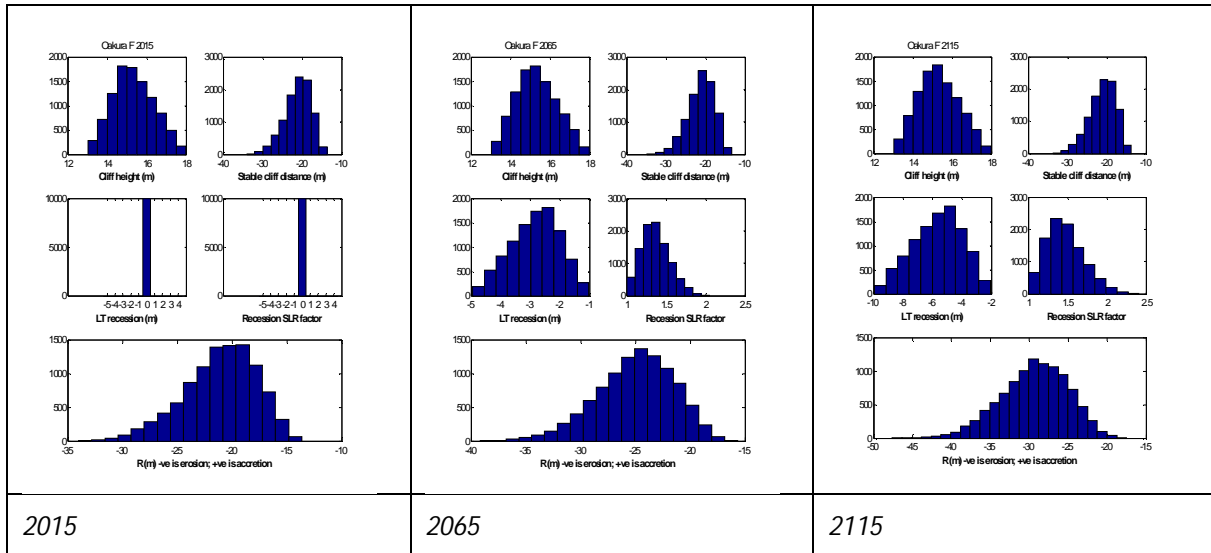


Figure 17-7 Histograms of parameter samples and the resultant shoreline distances for 2015, 2065 and 2115 timeframes for cell 17F

Table 17-2 Coastal Erosion Hazard Zone Widths

Site		17. Oakura											
Cell		17A			17B			17BB			17C		
Time		2015	2065	2115	2015	2065	2115	2015	2065	2115	2015	2065	2115
Probability of CEHZ (m) exceeding	Min	-7	-15	-25	-8	-16	-27	-8	-13	-22	-8	-13	-21
	99%	-8	-19	-33	-9	-20	-35	-9	-18	-30	-9	-18	-30
	95%	-9	-22	-38	-10	-23	-40	-9	-20	-35	-10	-21	-35
	90%	-9	-23	-41	-10	-24	-43	-10	-22	-38	-11	-22	-38
	80%	-10	-25	-45	-11	-26	-47	-11	-23	-42	-12	-24	-43
	70%	-11	-26	-48	-12	-27	-50	-12	-25	-45	-12	-25	-46
	66%	-11	-26	-49	-12	-28	-51	-12	-25	-46	-12	-26	-47
	60%	-12	-27	-51	-12	-29	-53	-12	-26	-48	-13	-27	-49
	50%	-12	-28	-54	-13	-30	-56	-13	-27	-51	-13	-28	-51
	40%	-13	-29	-56	-13	-31	-59	-13	-28	-54	-14	-29	-54
	33%	-13	-30	-59	-14	-32	-61	-14	-29	-56	-14	-30	-56
	30%	-13	-31	-60	-14	-32	-62	-14	-30	-57	-14	-30	-58
	20%	-14	-32	-64	-15	-34	-66	-15	-31	-61	-15	-32	-62
	10%	-15	-34	-69	-16	-36	-72	-16	-34	-67	-16	-34	-67
	5%	-16	-36	-74	-16	-38	-76	-16	-35	-71	-17	-36	-72
	1%	-17	-39	-82	-17	-41	-84	-17	-39	-79	-18	-39	-80
Max	-18	-45	-97	-18	-46	-100	-18	-44	-94	-18	-44	-97	
CEHZ1	-26			-28			-25			-26			
CEHZ2	-74			-76			-71			-72			

Site		17. Oakura								
Cell		17D			17E			17F		
Time		2015	2065	2115	2015	2065	2115	2015	2065	2115
Probability of CEHZ (m) exceeding	Min	-8	-17	-31	-4	-6	-8	-14	-16	-17
	99%	-9	-21	-37	-4	-7	-10	-15	-18	-21
	95%	-10	-23	-41	-4	-8	-11	-16	-20	-23
	90%	-10	-25	-44	-4	-8	-12	-17	-21	-24
	80%	-11	-26	-47	-5	-9	-14	-18	-22	-26
	70%	-12	-28	-50	-5	-9	-15	-19	-23	-27
	66%	-12	-28	-51	-5	-10	-15	-19	-23	-27
	60%	-12	-29	-53	-5	-10	-16	-20	-24	-28
	50%	-13	-30	-56	-5	-10	-17	-21	-25	-29
	40%	-13	-31	-59	-5	-11	-18	-22	-26	-30
	33%	-14	-32	-61	-6	-11	-19	-22	-26	-31
	30%	-14	-32	-62	-6	-11	-19	-23	-27	-31
	20%	-15	-34	-66	-6	-12	-21	-24	-28	-33
	10%	-16	-36	-71	-6	-13	-23	-26	-30	-35
	5%	-16	-37	-75	-6	-14	-25	-27	-31	-37
	1%	-17	-40	-83	-7	-16	-30	-30	-34	-40
	Max	-18	-47	-96	-8	-18	-37	-34	-39	-48
	CEHZ1	-28			-10			-23		
	CEHZ2	-75			-25			-37		

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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).

A4 SCALE 1:6,000

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CHECKED	TDS	Dec.17
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SCALE (AT A4 SIZE) 1:6,000		
PROJECT No. 1001049		

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 Coastal Erosion Hazard Assessment
 Oakura Bay
 Site: 17

FIGURE No. **Figure 17-8**

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, L
IGN, and the GIS User Community

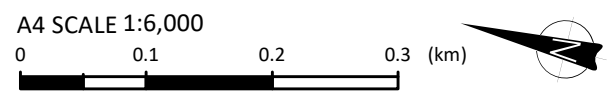
Legend

←→ Cell Extent

Shorelines

- 2014 baseline
- 14/01/2014
- 29/03/1998
- 13/12/1985
- 02/05/1966
- 19/01/1957

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



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Historic shorelines
Oakura Bay
Site: 17