21 Te Ngaere Beach

Description and geomorphology

Te Ngaere Beach is situated within Taiue Bay on the east coast of Northland, which is located approximately 24 km north of Kerikeri.

The north-east facing shoreline forms a pocket beach embayment which is approximately 700 m long. Te Ngaere Beach is situated between Omorere reef in the west and another rock headland in the east.

The site has a sandy beach comprising fine to medium sand. The beach has a berm width of approximately 5 – 10 m above the high tide line.

The dune is well vegetated along the dune slope and crest. The dune vegetation is sparse over the backshore due to the relatively close proximity of dwellings. The dune heights range from approximately RL 3 to 5 m along the site.

The Te Ngaere Stream mouth is located at the eastern end of the site. A relatively large intertidal spit has formed at this end of the beach, which forces the stream flow north along the base of eastern headland. Another small stream exists at the western end of the site, which appears to have a minimal effect on shoreline position.

Local considerations

There are no erosion protection structures located at this site on the open coast. A rock revetment exists along the northern side of the stream channel located adjacent to the entrance. The topography rises up at the western end of the site back of Omorere reef.

Cell 21C contains some additional uncertainty due to the backshore topography. Although the shoreline morphology comprises weakly consolidated Holocene sand dunes, the backshore has hill slope topography and slope instability is a factor. The resulting hazard zones are dashed in these areas to reflect this uncertainty

Coastal Erosion Hazard Assessment

The site is split into three cells based on differences in dune height and geomorphology. All three cells are characterised as non-consolidated beach types. Adopted component values are presented within Table 21-1. Long-term trends are erosional at the western end to variable in the centre and slightly erosional at the eastern end.

Site Photograph A (east)

Site Photograph B (west)

Site Photograph C (spit)

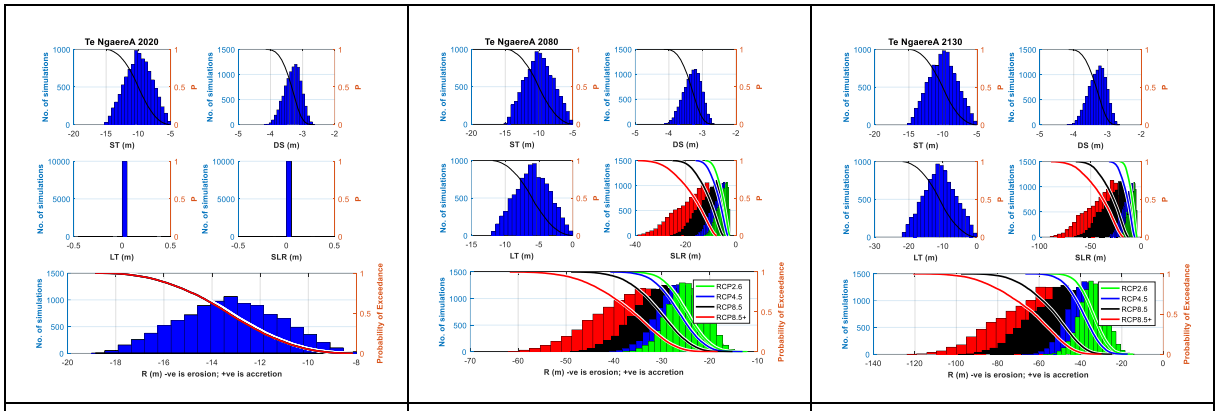
Coastal Erosion Hazard Zone widths are presented within Table 21-2 to 21-4 and Figure 21-4.

Histograms of individual components and resultant CEHZ distances using a Monte Carlo technique are shown in Figure 21-1 to Figure 21-3. CEHZ's have been mapped in agreement with the calculated values, although hazard lines have been dashed where the backshore geomorphology has changed from Holocene dune to more competent hill slide to reflect this uncertainty.

Figure 20-5 shows the available historic shorelines for Te Ngaere Beach.

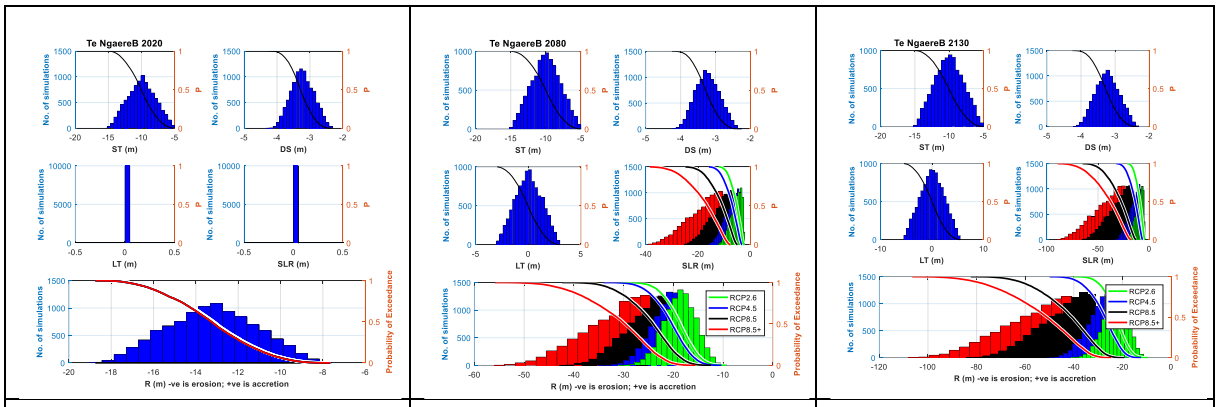
Table 21-1 Component values for Erosion Hazard Assessment

Site		**21. Te Ngaere**		
Cell		21A	21B	21C
Cell centre (NZTM)	E	1679021	1679296	1679527
	N	6124247	6124297	6124465
Chainage, m (from N/W)		0-90	90-580	580-690
Morphology		Dune	Dune	Dune
Short-term (m)	Min	5	5	5
	Mode	10	10	10
	Max	15	15	20
Dune/Cliff elevation (m above toe or scarp)	Min	3.5	3.0	1.5
	Mode	4.0	4.1	2.0
	Max	4.9	5.0	2.5
Stable angle (deg)	Min	30	30	30
	Mode	32	32	32
	Max	34	34	34
Long-term (m) -ve erosion +ve accretion	Min	0	0.05	0
	Mode	-0.1	0	-0.05
	Max	-0.2	-0.05	-0.1
Closure slope (beaches)	Min	0.067	0.067	0.067
	Mode	0.019	0.019	0.019
	Max	0.013	0.013	0.013
SLR 2080 (m)	RCP 2.6	0.16	0.16	0.16
	RCP 4.5	0.21	0.21	0.21
	RCP 8.5M	0.33	0.33	0.33
	RCP 8.5H+	0.51	0.51	0.51
SLR 2130 (m)	RCP 2.6	0.28	0.28	0.28
	RCP 4.5	0.42	0.42	0.42
	RCP 8.5M	0.85	0.85	0.85
	RCP 8.5H+	1.17	1.17	1.17



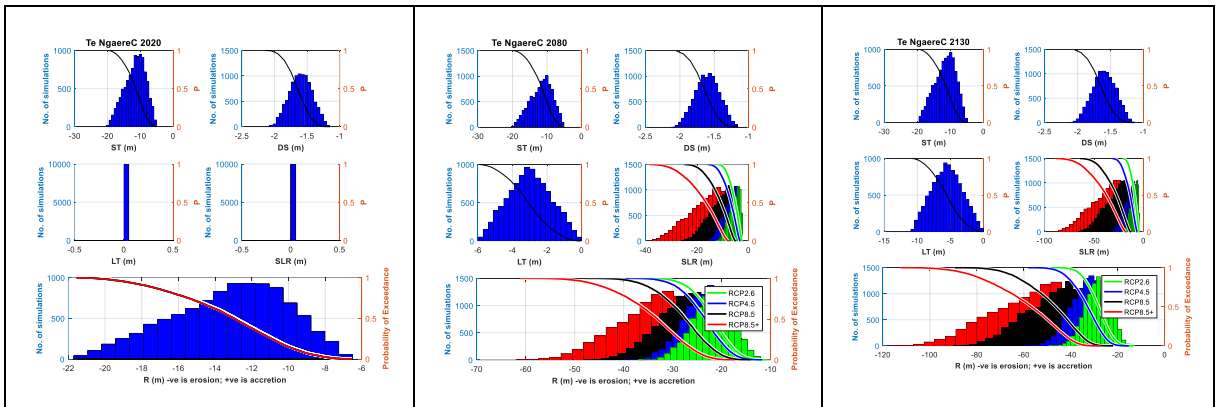
2020	2080	2130

Figure 21-1 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 21A



2020	2080	2130

Figure 21-2 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 21B



2020	2080	2130

Figure 21-3 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 21C

Table 21-2 Coastal Erosion Hazard Zone Widths for 2020

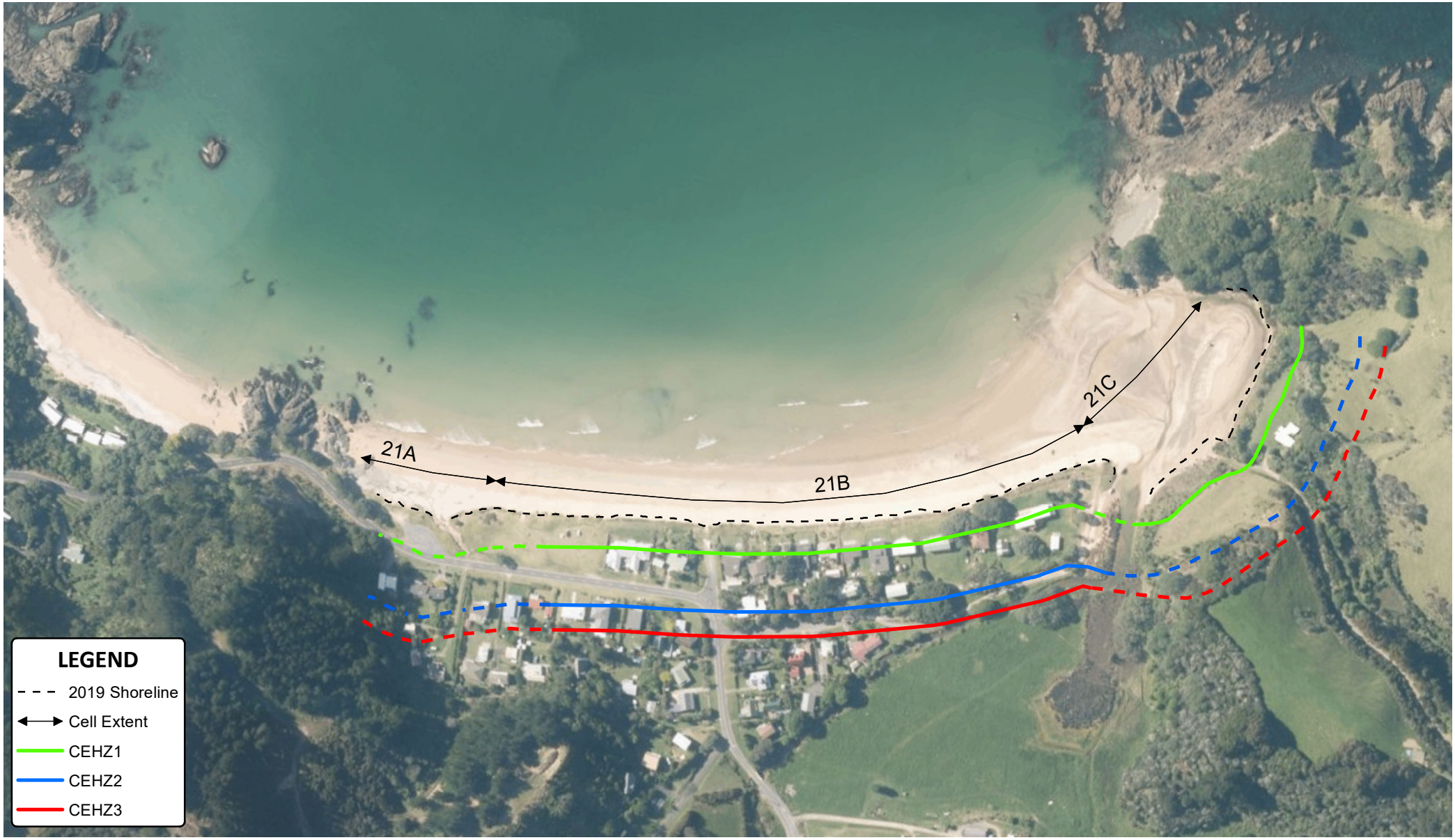
Site		21. Te Ngaere		
		A	B	C
Probability of CEHZ (m) Exceedance	Min	-8	-8	-7
	99%	-9	-9	-8
	95%	-10	-10	-9
	90%	-11	-10	-9
	80%	-11	-11	-10
	70%	-12	-12	-11
	66%	-12	-12	-12
	60%	-13	-13	-12
	50%	-13	-13	-13
	40%	-14	-14	-14
	33%	-14	-14	-15
	30%	-14	-14	-15
	20%	-15	-15	-16
	10%	-16	-16	-18
	5%	-17	-17	-19
	1%	-18	-18	-20
	Max	-18	-19	-21

Table 21-3 Coastal Erosion Hazard Zone Widths Projected for 2080

Site		21. Te Ngaere											
Cell		21A				21B				21C			
RCP scenario		2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+
Probability of CEHZ (m) Exceedance	Min	-12	-13	-15	-18	-9	-10	-12	-16	-11	-12	-14	-17
	99%	-17	-18	-20	-24	-12	-13	-15	-19	-14	-15	-17	-21
	95%	-19	-20	-23	-26	-14	-15	-17	-21	-16	-17	-20	-23
	90%	-20	-21	-24	-28	-15	-16	-19	-23	-17	-18	-21	-25
	80%	-22	-23	-26	-30	-16	-17	-20	-25	-18	-20	-23	-27
	70%	-23	-24	-28	-32	-17	-18	-22	-26	-20	-21	-25	-29
	66%	-23	-25	-28	-33	-17	-19	-22	-27	-20	-22	-25	-30
	60%	-24	-25	-29	-34	-18	-19	-23	-28	-21	-22	-26	-31
	50%	-25	-26	-30	-36	-19	-20	-24	-30	-22	-23	-27	-33
	40%	-26	-28	-32	-38	-19	-21	-25	-32	-23	-25	-29	-35
	33%	-27	-28	-33	-40	-20	-22	-26	-33	-23	-25	-30	-37
	30%	-27	-29	-33	-41	-20	-22	-27	-34	-24	-26	-30	-37
	20%	-28	-30	-35	-43	-21	-24	-29	-37	-25	-27	-32	-40
	10%	-30	-32	-38	-47	-23	-25	-31	-41	-27	-29	-35	-44
	5%	-31	-34	-40	-50	-24	-27	-33	-44	-29	-31	-37	-47
	1%	-34	-37	-44	-55	-26	-29	-37	-49	-31	-34	-41	-52
	Max	-38	-41	-49	-62	-31	-34	-42	-56	-36	-40	-48	-61
	CEHZ1	-28				-22				-25			

Table 21-4 Coastal Erosion Hazard Zone Widths Projected for 2130

Site		21. Te Ngaere											
Cell		21A				21B				21C			
RCP scenario		2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+
Probability of CEHZ (m) Exceedance	Min	-15	-17	-25	-30	-10	-12	-19	-25	-13	-15	-22	-27
	99%	-21	-23	-32	-38	-13	-16	-24	-29	-18	-21	-29	-35
	95%	-24	-27	-37	-43	-16	-19	-27	-33	-20	-23	-32	-38
	90%	-26	-30	-39	-46	-17	-20	-29	-36	-22	-25	-34	-41
	80%	-29	-32	-43	-51	-19	-22	-32	-40	-24	-27	-38	-45
	70%	-31	-35	-46	-54	-20	-24	-35	-43	-25	-29	-41	-49
	66%	-31	-35	-47	-56	-21	-25	-36	-45	-26	-30	-42	-50
	60%	-32	-37	-49	-58	-21	-26	-38	-47	-27	-31	-43	-52
	50%	-34	-39	-52	-62	-23	-27	-41	-51	-28	-33	-46	-57
	40%	-36	-40	-56	-67	-24	-29	-44	-56	-30	-35	-50	-61
	33%	-37	-42	-58	-71	-25	-30	-47	-59	-31	-36	-53	-65
	30%	-37	-43	-60	-73	-25	-31	-48	-61	-31	-37	-54	-67
	20%	-39	-45	-64	-79	-27	-33	-53	-67	-33	-39	-59	-73
	10%	-42	-49	-71	-87	-29	-36	-59	-76	-35	-42	-65	-82
	5%	-44	-52	-75	-94	-31	-39	-64	-82	-37	-45	-69	-88
	1%	-49	-57	-84	-105	-35	-44	-72	-93	-41	-50	-77	-98
	Max	-57	-67	-98	-121	-40	-50	-82	-106	-48	-58	-89	-113
	CEHZ2	-75				-64				-69			
	CEHZ3	-94				-82				-88			



Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography.
Northland 0.4m Rural Aerial Photos (2014-2016).

A4 SCALE 1:4,000

0 0.1 0.2 (km)

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

DRAWN	JJOU	May.20
CHECKED		
APPROVED		
ARCFILE 1012360_CEHZ001_v2.mxd		
SCALE (AT A4 SIZE) 1:4,000		
PROJECT No. 1012360		

NORTHLAND REGIONAL COUNCIL

Coastal Erosion Hazard Assessment

Te Ngaere Beach

Site: 21

FIGURE No. Figure 21-4

Rev. 1

Path: P:\1012360\WorkingMaterial\GIS\CEHZ maps\1012360_CEHZ001_v2.mxd Date: 29/05/2020 Time: 6:09:06 am

Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography.
Northland 0.4m Rural Aerial Photos (2014-2016).

A4 SCALE 1:4,000

0 0.1 0.2 (km)

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

DRAWN	JJOU	Jun.20
CHECKED		
APPROVED		
ARCFILE 1012360_Historicv2.mxd		
SCALE (AT A4 SIZE) 1:4,000		
PROJECT No. 1012360		

NORTHLAND REGIONAL COUNCIL

Historic Shorelines
Te Ngaere Beach
Site: 21

FIGURE No. Figure 21-5

Rev. 1

Path: P:\1012360\WorkingMaterial\GIS\CEHZ maps\1012360_Historicv2.mxd Date: 9/06/2020 Time: 9:26:19 AM