# Jacobs

### Takutai Kāpiti – Coastal Science and Engineering Services

Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment Volume 2: Results

IS355300-NC-RPT-004 | 2 February 2022

### Kāpiti Coast District Council





## Appendix A. 2050 Projected Future Shoreline Position Maps



CUENT Kapiti Coast District Council		0.2m and 0.4m RSLR 2050	lacobs
Takutai Kapiti Coastal Hazards Assessment			Jacobs
scale 1:7,500 @A3	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, wynn williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Map 1 North Ōtaki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council	0.2m and 0.4m DSLD 20	
PROJECT Takutai Kapiti Coastal Hazards Assessme	ent U.2III dIIU U.4III KSLK 20	
scale         project col           1:7,500         @ A3	Projected Future Shoreline Positions (PF	SP) Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN	Base Aerial Imagery from 2017 Map 2 Ōtaki Beach and Waitohu Str	eam Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 2/21/202	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901





### Legend

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----- Present Day Shoreline (2017)

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- - - Present Day Hazard (Short-term and Dune Stability)

- - - Cell Boundary

0.2m RSLR Range of Most Likely Shoreline Positions (66-33%)
 0.2m RSLR Range of Potential Shoreline Positions (99-10%)
 0.4m RSLR Range of Most Likely Shoreline Positions (66-33%)
 0.4m RSLR Range of Potential Shoreline Positions (99-10%)
 0.4m RSLR Potential Hydrosystem Extent
 Coastal Stormwater Outlet

CLIENT Kapiti Coast District Council		0.2m and 0.4m RSI R 2050	lacobs
Takutai Kapiti Coastal Hazards Assessment			Jacobs
scale	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building,
1:7,500 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	drawn	Base Aerial Imagery from 2017 Map 3 Ōtaki River	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	2/21/2022		F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m PSL P 2050	"acaba
PROJECT Takutai Kaniti Coastal Hazards Assessment		0.2111 dilu 0.4111 K3LK 2050	Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 4 Te Horo	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR AH	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

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25 MXD\Erosion Mapping Outputs 2050 V2.mxd



<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.4m BSI B 2050	<sup>1</sup> acaba
PROJECT		0.2111 dilu 0.4111 K5LK 2050	Jacops
SCALE 1:7,500 @ A3	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 5 Te Horo Beach and Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR AH	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m PSI P 2050	<sup>1</sup> acaba
PROJECT Takutai Kaniti Coastal Hazards Assessment		0.2111 dilu 0.4111 K5LK 2050	Jacobs
scale 1:7,500 @A	PROJECT CODE 3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 6 Peka Peka	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council	0.2m and 0.4m DSLD 20E0	Je cobe
PROJECT Takutai Kapiti Coastal Hazards Assessment	0.2111 d110 0.4111 R5LR 2050	Jacobs
SCALE   PROJECT CODE 1:7,500 @ A3   IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building 47 Hereford Street
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Map 7 Peka Peka and Te Kowhai Stream	Christchurch Central 8013 New Zealanc
PROJECT DIRECTOR DATE AH 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m BSI B 2050	<sup>1</sup> acaba
<i>PROJECT</i> Takutai Kapiti Coastal Hazards Assessment			Jacobs
scale 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 8 Peka Peka	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council			0.2m and 0.4m DSI D 2050	Jacoba
PROJECT			0.2111 dilu 0.4111 KSLK 2050	Jacops
<i>SCALE</i> 1:7,500	@ A3 IS355300		Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017	Map 9 Waikanae Beach and Waimeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the prese	ent day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



Legend
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CLIENT Kapiti Coast District Council		0.2m and 0.4m PSLP 2050	"acaba
<sup>PROJECT</sup> Takutai Kapiti Coastal Hazards Assessment		0.2111 dilu 0.4111 K3LK 2030	Jacobs
scale 1:7,500 @A3	PROJECT CODE BIS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 10 Waikanae River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



Present Day Hazard (Short-term and Dune Stability)
Cell Boundary
0.2m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.2m RSLR Range of Potential Shoreline Positions (99-10%)
0.4m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.4m RSLR Range of Potential Shoreline Positions (99-10%)
0.2m & 0.4m RSLR Potential Hydrosystem Extent (Historical Envelope)
0.4m RSLR Potential Hydrosystem Extent
Coastal Stormwater Outlet

CLIENT Kapiti Coast District Council		0.2m and 0.4m PSLP 2050	"acaba
PROJECT Takutai Kaniti Coa	stal Hazards Assessment	0.2111 dilu 0.4111 KJLK 2050	Jacobs
<i>SCALE</i> 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 11 Paraparaumu	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m BSI B 2050	Jacoba
PROJECT Takutai Kapiti Coastal Hazards Assessment		0.2111 dilu 0.4111 K5LK 2050	Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building 47 Hereford Street
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 12 Tikotu Creek and Northern Raumati	Christchurch Central 8013 New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m DSLD 2050	Jacoba
PROJECT		0.2111 and 0.4111 RSLR 2030	Jacobs
Takutai Kapiti Coastal Hazards Assessment		Drojected Euture Shareline Desitions (DESD)	Level 2 Wynn Williams building
1:7,500 @A3	IS355300	Projected Future Shoretine Positions (PFSP)	47 Hereford Street,
PROJECT MANAGER	DRAWN	Base Aerial Imagery from 2017 Map 13 Raumati and Wharemauku Stream	Christchurch Central 8013, New Zealand
			T +64 3 940 4900
AH	2/21/2022	Note: Unly PFSP landward of the present day shoreline are shown.	F +64 3 940 4901





- - - Present Day Hazard (Short-term and Dune Stability)

– – – Cell Boundary

0.2m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.2m RSLR Range of Potential Shoreline Positions (99-10%)
0.4m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.4m RSLR Range of Potential Shoreline Positions (99-10%)
0.2m RSLR Potential Hydrosystem Extent
0.4m RSLR Potential Hydrosystem Extent
Pump Station

▲ Coastal Stormwater Outlet

CLIENT Kapiti Coast District Council			0.2m and 0.4m PSI P 2050	<sup>1</sup> acaba
PROJECT Takutai Kaniti Coastal Hazarde	Accessment		0.2111 dilu 0.4111 KSLK 2050	Jacobs
SCALE 1:7,500 @A3	PROJECT CODE IS355300		Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017	Map 14 Southern Raumati and Queen Elizabeth Park	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR AH	DATE 2/21/2022	Note: Only PFSP landward of the pre	sent day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m PSI P 2050	"acaba
PROJECT Takutai Kapiti Coastal Hazards	s Assessment		Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 15 Queen Elizabeth Park and Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m PSL P 2050	Jacoba
PROJECT Takutai Kaniti Coas	stal Hazards Assessment	0.2111 dilu 0.4111 K5LK 2050	Jacobs
SCALE 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 16 Paekākāriki and Wainui Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.4m DSLD 20E0	Jacoba
PROJECT Takutai Kapiti Coastal Hazards Assessment			Jacobs
scale 1:7,500 @A3	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 17 Paekākāriki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



## Appendix B. 2070 Projected Future Shoreline Position Maps



CLIENT Kapiti Coast District Council		0.3m and 0.7m BSLR 2070	<sup>1</sup> acaba
PROJECT Takutai Kapiti Coastal Hazards Assessment			Jacobs
scale 1:7,500 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 1 North Utaki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.7m BSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazarda	s Assessment	0.5111 dilu 0.7111 KSLK 2070	Jacops
<i>SCALE</i> 1:7,500 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 2 Otaki Beach and Waitohu Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901





-	Present Day Hazard (Short-term and Dune Stability)
-	Cell Boundary
	PFSP 0.3m RSLR Range of Most Likely Shoreline Positions (66-33%)
	PFSP 0.3m RSLR Range of Potential Shoreline Positions (99-10%)
	PFSP 0.7m RSLR Range of Most Likely Shoreline Positions (66-33%)
	PFSP 0.7m RSLR Range of Potential Shoreline Positions (99-10%)
	0.4m RSLR Potential Hydrosystem Extent
	0.65m RSLR Potential Hydrosystem Extent
	Coastal Stormwater Outlet
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<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.7m BSLD 2070	<b>J</b> acaba
PROJECT		0.5111 dilu 0.7111 K5LK 2070	Jacobs
<i>SCALE</i>	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building,
1:7,500 @ A3	IS355300		47 Hereford Street,
PROJECT MANAGER	DRAWN	Base Aerial Imagery from 2017 Map 3 Otaki River	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	2/21/2022		F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m PSI D 2070	<b>J</b> osehs
PROJECT Takutai Kaniti Coa	istal Hazards Assessment	0.5111 dilu 0.7111 KSLK 2070	Jacobs
<i>SCALE</i> 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Map 4 Te Horo	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

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CLIENT Kapiti Coast District Council		0.2m and 0.7m BSI B 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazardu	According	0.5111 dilu 0.7111 K5LK 2070	Jacops
<i>SCALE</i> 1:7,500 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 5 Te Horo Beach and Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m DSLD 2070	<sup>1</sup> acaba
PROJECT		0.5111 and 0.7111 RSER 2070	Jacobs
Iakutai Kapiti Coastal Hazards Assessment       scale     PROJECT CODE       1:7,500     @ A3		Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 6 Peka Peka	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.7m DSLD 2070	<b>J</b> ocobo
PROJECT Takutai Kapiti Coastal Hazard	s Assessment	0.5111 dilu 0.7111 K5LK 2070	Jacops
<i>SCALE</i> 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map / Peka Peka and Te Kowhai Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m BSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazards Asse	sessment	0.5111 dilu 0.7111 K5LK 2070	Jacops
SCALE         PROJ           1:7,500         @ A3	DIECT CODE 855300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAW	NWN M	Base Aerial Imagery from 2017 Map 8 Peka Peka	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 2/2	e 21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m DSLD 2070	Jacoba
PROJECT Takutai Kapiti Coas	tal Hazards Assessment	0.5111 dilu 0.7111 KSLK 2070	Jacops
SCALE 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 9 Walkanae Beach and Walmeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



- Pre	sent Day Hazard (Shon-term and Dune Stability)
- Cel	l Boundary
PF	SP 0.3m RSLR Range of Most Likely Shoreline Positions (66-33%)
PF	SP 0.3m RSLR Range of Potential Shoreline Positions (99-10%)
PF	SP 0.7m RSLR Range of Most Likely Shoreline Positions (66-33%)
PF	SP 0.7m RSLR Range of Potential Shoreline Positions (99-10%)
0.4	m RSLR Potential Hydrosystem Extent
0.6	5m RSLR Potential Hydrosystem Extent
Coa	astal Stormwater Outlet

CLIENT Kapiti Coast District Council		0.3m and 0.7m PSI P 2070	"acaba
PROJECT	Accorcmont	0.511 and 0.711 K5EK 2070	Jacobs
<i>SCALE</i> 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 10 Waikanae River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m DSLD 2070	<b>J</b> ocobo
PROJECT Takutai Kapiti Coas	tal Hazarda Assocsment	0.5111 driu 0.7111 K5LK 2070	Jacops
scale 1:7,500	@A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 11 Paraparaumu	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.7m BSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazarda	Assessment	0.5111 dilu 0.7111 KSLK 2070	Jacobs
<i>SCALE</i> 1:7,500 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building 47 Hereford Street
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 12 Tikotu Creek and Northern Raumati	Christchurch Central 8013 New Zealanc
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council	0.2m and 0.7m PSL P 2070	<b>J</b> ocobo
PROJECT Takutai Kapiti Coastal Hazards Assessment	0.5111 dru 0.7111 K5LR 2070	Jacops
SCALE PROJECT CODE 1:7,500 @ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building 47 Hereford Street
PROJECT MANAGER DRAWN	Base Aerial Imagery from 2017 Map 13 Raumati and Wharemauku Stream	Christchurch Central 8013 New Zealand
PROJECT DIRECTOR DATE AH 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901





	Cell Boundary	
	PFSP 0.3m RSLR Range of Most Likely Shoreline Positions (66-33%)	
	PFSP 0.3m RSLR Range of Potential Shoreline Positions (99-10%)	No. of Concession, Name
	PFSP 0.7m RSLR Range of Most Likely Shoreline Positions (66-33%)	A COMPANY
	PFSP 0.7m RSLR Range of Potential Shoreline Positions (99-10%)	No.
	0.3m RSLR Potential Hydrosystem Extent	and the second
	0.7m RSLR Potential Hydrosystem Extent	Contraction of the local division of the loc
	Pump Station	
	Coastal Stormwater Outlet	
-		and

CLIENT Kapiti Coast District Council		0.2m and 0.7m DSI D 2070	Jacoba
PROJECT Takutai Kaniti Coastal Hazarda	s Assessment	0.5111 dilu 0.7111 KSLK 2070	Jacods
scale	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building,
1:7,500 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	DRAWN	Base Aerial Imagery from 2017 Map 14 Southern Raumati and Queen Elizabeth Park	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	2/21/2022		F +64 3 940 4901

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CLIENT Kapiti Coast District Council		0.2m and 0.7m BSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazarde Assessment		0.5111 dilu 0.7111 K5LK 2070	Jacops
<i>SCALE</i> 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 15 Queen Elizabeth Park and Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m and 0.7m DSLD 2070	<b>J</b> ecolog
PROJECT		0.511 and 0.711 RSLR 2070	Jacobs
Takutai Kapiti Coastal Hazards Assessment		Drain stand Future Charaline Desitions (DECD)	Level 2. Were Williers huilding
<sup>SCALE</sup> 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	47 Hereford Street,
PROJECT MANAGER	DRAWN	Map 16 Paekākāriki and Wainui Stream	Christchurch Central 8013,
IW	KM	Base Aerial Imagery from 2017	New Zealand
PROJECT DIRECTOR	DATE	Note: Only DESD landward of the present day shareline are shown	T +64 3 940 4900
AH	2/21/2022	Note. Only Pror tandward of the present day shoreline are shown.	F +64 3 940 4901


CLIENT Kapiti Coast District Council		0.3m and 0.7m PSI P 2070	<sup>1</sup> acaba
PROJECT Takutai Kapiti Coastal Hazard	s Assessment	0.511 dilu 0.711 K5LK 2070	Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 17 Paekakariki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



# Appendix C. 2120 Projected Future Shoreline Position Maps



CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSI D 2120	<sup>1</sup> ocobo
PROJECT Takutai Kapiti Coastal Hazard	s Assessment	0.0111, 0.05111, 1.25111 & 1.05111 K5LR 2120	Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 1 North Utaki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment		0.6m, 0.85m, 1.25m & 1.65m RSLR 2120	Jacobs
<i>SCALE</i> 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 2 Otaki Beach and Waitohu Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	I +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSI D 2120	<sup>1</sup> acaba
<sup>project</sup> Takutai Kapiti Coastal Hazards	s Assessment		Jacobs
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 3 Otaki River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council PROJECT		0.6m, 0.85m, 1.25m & 1.65m RSLR 2120	Jacobs
Takutai Kapiti Coastal Hazards Assessment			<b>U</b> UUUUU
<sup>SCALE</sup> 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Map 4 Te Horo	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR AH	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901





Present Day Shoreline (2017)
Present Day Hazard (Short-term and Dune Stability)
Cell Boundary
0.6m RSLR Range of Most Likely Shoreline Position (66-33%)
0.85m RSLR Range of Most Likely Shoreline Position (66-33%)
1.25m RSLR Range of Most Likely Shoreline Position (66-33%)
1.65m RSLR Range of Most Likely Shoreline Position (66-33%)
0.6m RSLR Range of Potential Shoreline Positions (99-10%)
1.65m RSLR Range of Potential Shoreline Positions (99-10%)
1.65m RSLR Potential Hydrosystem Extent
Coastal Stormwater Outlet

CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSLD 2120	Jacoba
PROJECT Taluutai Kapiti Coastal Har	ards Assassment	0.0111, 0.05111, 1.25111 & 1.05111 K5LK 2120	Jacobs
SCALE 1:7,400 @	PROJECT CODE 0.A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 5 Te Horo Beach and Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.85m 1.25m & 1.65m PSI P.2120	<sup>1</sup> acaba
PROJECT Takutai Kaniti Coastal Hazardo	Assessment	0.011, 0.0011, 1.2011 & 1.00111 KOLK 2120	Jacobs
scale	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building,
1:7,500 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	drawn	Base Aerial Imagery from 2017 Map 6 Peka Peka	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	2/21/2022		F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSI D 2120	<sup>1</sup> ocobo
PROJECT Takutai Kapiti Coastal Hazards	Assessment	0.0111, 0.05111, 1.25111 & 1.05111 K5LR 2120	Jacobs
SCALE 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 7 Peka Peka and Te Kowhai Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSI D 2120	<b>J</b> acaba
PROJECT Takutai Kapiti Coastal Hazards	Assessment	0.0111, 0.05111, 1.25111 & 1.05111 K5LK 2120	Jacops
scale 1:7,500 @A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 8 Peka Peka	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.85m 1.25m & 1.65m PSI P.2120	<sup>1</sup> acaba
PROJECT Takutai Kaniti Coastal Hazards Assessment		0.011, 0.0511, 1.25111& 1.05111 K5LK 2120	Jacobs
<i>SCALE</i> 1:7,500	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 9 Waikanae Beach and Waimeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.9Em 1.2Em 8 1.6Em DSI D 2120	<sup>1</sup> ocobo
PROJECT Takutai Kapiti Coastal Hazarr	de Accosement	0.011, 0.05111, 1.25111 & 1.05111 K5LK 2120	Jacops
SCALE 1:7,500 @A	PROJECT CODE 3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 10 Waikanae River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.9Em 1.2Em 8 1.6Em DSI D 2120	Jacoba
PROJECT Takutai Kapiti Coa	stal Hazards Assessment	0.011, 0.05111, 1.25111 & 1.05111 K5LK 2120	Jacobs
scale 1:7,400	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Map 11 Paraparaumu	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSLD 2120	Jeeebe
PROJECT	Accorcmont	0.011, 0.8511, 1.2511 & 1.6511 R5LR 2120	Jacops
<i>SCALE</i> 1:7,400 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Map 12 Tikotu Creek and Northern Raumati	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8.1.6Em DSI D.2120	Jacoba
PROJECT		0.611, 0.8511, 1.2511 & 1.8511 K3LR 2120	Jacops
SCALE 1:7,500 @A	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Map 13 Raumati and Wharemauku Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



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- - - Present Day Hazard (Short-term and Dune Stability)

- - - Cell Boundary



0.6m RSLR Range of Most Likely Shoreline Position (66-33%)
0.85m RSLR Range of Most Likely Shoreline Position (66-33%)
1.25m RSLR Range of Most Likely Shoreline Position (66-33%)
1.65m RSLR Range of Most Likely Shoreline Position (66-33%)
0.6m RSLR Range of Potential Shoreline Positions (99-10%)
1.65m RSLR Range of Potential Shoreline Positions (99-10%)
0.6m RSLR Potential Hydrosystem Extent
1.65m RSLR Potential Hydrosystem Extent
Pump Station
Coastal Stormwater Outlet

CLIENT Kapiti Coast District Council		0.6m 0.95m 1.25m § 1.65m DSI D 2120	Jacoba
PROJECT		0.011, 0.8511, 1.2511 & 1.65111 K5LK 2120	Jacops
Takutai Kapiti Coastal Hazard	s Assessment	Drojected Euture Shereline Desitions (DESD)	Lovel 2 Wyon Williams huilding
SCALE	PROJECT CODE	Projected Future Shoreline Positions (PFSP)	Level 2, wynir wittanis buitting,
1:7,400 @A3	15355300	Man 1/ Southarn Doumati and Queen Elizabeth David	47 Hereford Street,
PROJECT MANAGER	DRAWN	Map 14 Southern Raumati and Queen Euzabeth Park	Christchurch Central 8013,
IW	KM	Base Aerial Imagery from 2017	New Zealand
PRO IECT DIRECTOR	DATE	Nates Only DECD landward of the present day shareling are shown	T +64 3 940 4900
AH	2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	F +64 3 940 4901



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	Present Day Shoreline (2017)
	Present Day Hazard (Short-term and Dune Stability)
	Cell Boundary
	0.6m RSLR Range of Most Likely Shoreline Position (66-33%)
	0.85m RSLR Range of Most Likely Shoreline Position (66-33%)
	1.25m RSLR Range of Most Likely Shoreline Position (66-33%)
	1.65m RSLR Range of Most Likely Shoreline Position (66-33%)
	0.6m RSLR Range of Potential Shoreline Positions (99-10%)
	1.65m RSLR Range of Potential Shoreline Positions (99-10%)
	0.6m RSLR Potential Hydrosystem Extent

CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSLD 2120	Jeeebe
PROJECT Takutai Kapiti Coas	stal Hazards Assossment	0.011, 0.0511, 1.2511 & 1.05111 K5LK 2120	Jacops
SCALE 1:7,400	@ A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 15 Queen Elizabeth Park and Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.85m 1.25m 8 1.65m DSI D 2120	<b>J</b> oseha
PROJECT Takutai Kaniti Coastal Hazardu	e Assessment	0.011, 0.0511, 1.2511 & 1.05111 K5LK 2120	Jacops
<i>SCALE</i> 1:7,500 @ A3	PROJECT CODE IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Map 16 Paekakariki and Wainui Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.6m 0.8Em 1.2Em 8 1.6Em DSLD 2120	<sup>1</sup> acaba
<i>PROJECT</i> Takutai Kapiti Coa	astal Hazards Assessment	0.0111, 0.05111, 1.25111 & 1.05111 K5LK 2 120	Jacobs
scale 1:7,500	@A3 IS355300	Projected Future Shoreline Positions (PFSP)	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Map 17 Paekakariki	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 2/21/2022	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



# Appendix D. Potential Hydrosystem Extents 2050, 2070 & 2120



CLIENT Kapiti Coast District Council		0.2m and 0.4m PSI P 2050	<sup>1</sup> ocobo
PROJECT Takutai Kapiti Coastal Hazards	Assessment	0.2111 dilu 0.4111 KSLR 2050	Jacobs
scale 1:1,770 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	<sup>DATE</sup> 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m & 0.7m BSI B 2070	<sup>1</sup> o coho
PROJECT Takutai Kapiti Coastal Hazarda	Assossment	0.5111 & 0.7111 K5LK 2070	Jacops
SCALE 1:1,770 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.65m 1m 1.25m & 1.65m BSI D 2120	<sup>1</sup> o coho
PROJECT Takutai Kapiti Coastal Hazardi	Accessment	0.05111, 1111, 1.25111 & 1.05111 K5LK 2120	Jacops
<i>SCALE</i> 1:1,770 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Whareroa Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

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CLIENT Kapiti Coast District Council		0.2m and 0.4m DSLD 2050	Jacoba
PROJECT		0.2111 d110 0.4111 K5LK 2050	Jacops
SCALE 1:1,510	PROJECT CODE A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Wharemauku Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council	0.2m 8.0.7m PSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazards Assessment	0.5111 & 0.7111 K5LK 2070	Jacops
SCALE PROJECT CODE 1:1,510 @ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Wharemauku Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



CLIENT Kapiti Coast District Council	0.65m 1m 1.25m & 1.65m PSI P.2120	"acaba
PROJECT	0.05111, 111, 1.25111 & 1.05111 K5LK 2 120	Jacops
ScALe     PROJECT CODE       1:1,510     @ A3 [IS355300]	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Wharemauku Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.2m and 0.4m BSI B 2050	<sup>1</sup> acaba
<i>PROJECT</i> Takutai Kapiti Coastal Hazards	Assessment	0.2111 dilu 0.4111 KSLK 2050	Jacobs
scale	PROJECT CODE	Potential Hydrosystem Extent	Level 2, Wynn Williams building,
1:1,500 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	DRAWN	Base Aerial Imagery from 2017 likotu Creek	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	12/21/2021		F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council	0.3m & 0.7m PSI P 2070	<sup>1</sup> ocobo
PROJECT Takutai Kaniti Coastal Hazards Assessment	0.511 & 0.711 K5LK 2070	Jacobs
SCALE     PROJECT CODE       1:1,500     @ A3	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Tikotu Creek	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.6Em 1m 1.2Em 8 1.6Em DSI D 2120	<sup>1</sup> acaba
PROJECT		0.05111, 111, 1.25111 & 1.05111 K5LK 2 120	Jacops
scale 1:1,500 @A	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Tikotu Creek	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council		0.2m and 0.4m RSI R 2050	"acaba
PROJECT Takutai Kapiti Coastal Hazards	Assessment		Jacobs
scale 1:5,640 @ A3	PROJECT CODE	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Waikanae River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council			<b>J</b> ocobo
PROJECT	- <b>A</b>	0.5111 & 0.7111 R5ER 2070	Jacops
Takutal Kapiti Coastal Hazard	s Assessment		
SCALE	PROJECT CODE	Potential Hydrosystem Extent	Level 2, Wynn Williams building,
1:5.640 @A3	15355300		47 Hereford Street.
	DRAMA	Waikanae River	Christchurch Central 8013
PROJECT MANAGER	DRAWN	Pasa Aprial Imagony from 2017	Christenarch Central OO 15,
IW	KM	base Aenat imagery nom 2017	New Zealand
PRO IECT DIRECTOR	DATE	Nate: Only DECD landward of the present day shouling are shown	T +64 3 940 4900
AH	12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.65m 1m 1.25m 8 1.65m DSI D 2120	<sup>1</sup> acaba
<i>PROJECT</i> Takutai Kapiti Coastal Hazard	s Assessment	0.05111, 111, 1.25111 & 1.05111 R5LR 2120	Jacobs
scale 1:5,640 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Waikanae River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



Present Day Hazard (Short-term and Dune Stability)
Cell Boundary
0.2m & 0.4m RSLR Potential Hydrosystem Extent (Historical Envelope)
0.2m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.4m RSLR Range of Most Likely Shoreline Positions (66-33%)
0.2m RSLR Range of Potential Shoreline Positions (99-10%)
0.4m RSLR Range of Potential Shoreline Positions (99-10%)
Pump Station
Coastal Stormwater Outlet

<sub>CLIENT</sub> Kapiti Coast District Council		0.2m and 0.4m BSL D 2050	<sup>1</sup> acaba
PROJECT Takutai Kapiti Coastal Hazarda	Accessment	0.2111 dilu 0.4111 KSLK 2050	Jacobs
<i>SCALE</i> 1:3,480 @ A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Waimeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council			<b>J</b> oseba
PROJECT	Accessment	0.5111 & 0.7111 K5LK 2070	Jacops
<i>scale</i> 1:3,480 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Waimeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sup>CLIENT</sup> Kapiti Coast District Council		0.65m 1m 1.25m 8 1.65m DSI D 2120	<sup>1</sup> acaba
PROJECT Talutai Kapiti Coastal Hazardo	Accorement	0.05111, 111, 1.25111 & 1.05111 K5LK 2 120	Jacobs
<i>SCALE</i> 1:3,480 @ A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Waimeha Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.2m and 0.4m PSI P 2050	"acaba
PROJECT Takutai Kaniti Coastal Hazardo	Assessment	0.2111 dilu 0.4111 KJLK 2050	Jacobs
SCALE 1:1,910 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Kowhai Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901


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CLIENT Kapiti Coast Distric	t Council	0.3m & 0.7m PSI P 2070	"acaba
PROJECT Takutai Kaniti Coas	tal Hazards Assessment	0.5m & 0.7m K3EK 2070	Jacobs
<i>SCALE</i> 1:1,910	@ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Kowhai Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.6Em 1m 1.2Em 8 1.6Em DSLD 2120	<sup>1</sup> e coho
PROJECT Takutai Kapiti Coastal Hazar	de Assessment	0.05111, 111, 1.25111 & 1.05111 R5LR 2120	Jacobs
SCALE 1:1,910 @ A	PROJECT CODE 3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Kowhai Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

Mangaone Stream Hydrosystem Cell



Ōtaki E

Te Horo

Peka Peka

Waikanae

Raumati

Parapar

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<sub>CLIENT</sub> Kapiti Coast District Council		0.2m and 0.4m PSLP 2050	Jacoba
PROJECT Takutai Kapiti Coastal Hazardo	Assessment	0.2111 dilu 0.4111 K3LK 2050	Jacops
<i>SCALE</i> 1:1,950 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

Mangaone Stream Hydrosystem Cell



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Te Horo

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<sub>CLIENT</sub> Kapiti Coast District	Council	0.2m & 0.7m PSI P 2070	<sup>1</sup> acaba
PROJECT Takutai Kaniti Coast	al Hazards Assessment	0.5111 & 0.7111 K5LK 2070	Jacobs
SCALE 1:1,950	@ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

Mangaone Stream Hydrosystem Cell



- - - Present Day Hazard (Short-term and Dune Stability) - - - Cell Boundary 0.6m, 0.85m & 1.25m SLR Hydrosystem (Historical Envelope) 1.65m SLR Hydrosystem Extent 0.85m RSLR Range of Most Likely Shoreline Position (66-33%) 1.25m RSLR Range of Most Likely Shoreline Position (66-33%) 1.65m RSLR Range of Most Likely Shoreline Position (66-33%) 0.6m RSLR Range of Potential Shoreline Positions (99-10%) 1.65m RSLR Range of Potential Shoreline Positions (99-10%) Coastal Stormwater Outlet 2880h

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CLIENT Kapiti Coast District Council		0.6Em 1m 1.2Em 8 1.6Em DSLD 2120	Jacoba
PROJECT Takutai Kaniti Coastal Hazard	s Assessment	0.05111, 111, 1.25111 & 1.05111 K5LK 2120	Jacops
<i>SCALE</i> 1:1,950 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	DRAWN KM	Base Aerial Imagery from 2017 Mangaone Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

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CLIENT Kapiti Coast District Council		0.2m and 0.4m PSI P 2050	<sup>1</sup> acaba
<i>PROJECT</i> Takutai Kapiti Coastal Hazards	Assessment		Jacobs
scale	PROJECT CODE	Potential Hydrosystem Extent	Level 2, Wynn Williams building,
1:3,790 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	DRAWN	Base Aerial Imagery from 2017 Otaki River	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	12/21/2021		F +64 3 940 4901



CLIENT Kapiti Coast District Council		0.2m & 0.7m PSI P 2070	Josepha
PROJECT Takutai Kapiti Coastal Hazards	Assessment		Jacobs
scale 1:3,790 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Otaki River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast Distric	t Council	0.6Em 1m 1.2Em 8 1.6Em DSLD 2120	Jacoba
PROJECT	tal Hazarde Accossmont	0.05111, 1111, 1.25111 & 1.05111 K5LK 2120	Jacops
SCALE 1:3,780	@A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Otaki River	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.2m and 0.4m BSI B 2050	Jacoba
PROJECT Takutai Kapiti Coastal Hazards	Assessment		Jacobs
scale	PROJECT CODE	Potential Hydrosystem Extent	Level 2, Wynn Williams building,
1:1,470 @A3	IS355300		47 Hereford Street,
PROJECT MANAGER	drawn	Base Aerial Imagery from 2017 Wainui Stream	Christchurch Central 8013,
IW	KM		New Zealand
PROJECT DIRECTOR	DATE	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900
AH	12/21/2021		F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council	0.2m & 0.7m BSI D 2070	Jacoba
PROJECT Takutai Kapiti Coastal Hazards Assessment	0.5111 & 0.7111 K5LK 2070	Jacobs
SCALE PROJECT CODE 1:1,470 @ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Wainui Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.4Em 1m 1.2Em 8 1.4Em DSI D 2120	Jacoba
<i>PROJECT</i> Takutai Kapiti Coastal Hazard	s Assessment		Jacobs
<sup>SCALE</sup> 1:1,470 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	drawn KM	Base Aerial Imagery from 2017 Wainui Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901

i, Ga<sup>r</sup> DC Waitohu Stream Hydrosystem Cell Waitohu Si Aps MXD\Inlets 2050.mxc





CLIENT Kapiti Coast District Cou PROJECT Takutai Kapiti Coastal H	uncil Iazards Assessment	0.2m and 0.4m RSLR 2050	Jacobs
scale 1:3,970	@ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER	DRAWN KM	Base Aerial Imagery from 2017 Waitohu Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901





<sub>CLIENT</sub> Kapiti Coast District Council	0.2m & 0.7m BSI B 2070	Jacoba
PROJECT Takutai Kaniti Coastal Hazards Assessment	0.5111 & 0.7111 K5LK 2070	Jacops
Scale 1:3,970 @ A3 IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER DRAWN IW KM	Base Aerial Imagery from 2017 Waitohu Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR DATE AH 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



<sub>CLIENT</sub> Kapiti Coast District Council		0.65m 1m 1.25m 8 1.65m DSI D 2120	<sup>1</sup> ocobo
PROJECT Takutai Kapiti Coastal Hazardu	Accessment	0.05111, 1111, 1.25111 & 1.05111 K5LK 2120	Jacops
SCALE 1:3,960 @A3	PROJECT CODE IS355300	Potential Hydrosystem Extent	Level 2, Wynn Williams building, 47 Hereford Street,
PROJECT MANAGER IW	drawn KM	Base Aerial Imagery from 2017 Waitohu Stream	Christchurch Central 8013, New Zealand
PROJECT DIRECTOR	DATE 12/21/2021	Note: Only PFSP landward of the present day shoreline are shown.	T +64 3 940 4900 F +64 3 940 4901



# Appendix E. Inundation Maps (2050, 2070 and 2120)



<sup>CLIENT</sup> Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment		-	Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
scale 1:10,000 @A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street,
PROJECT MANAGER IW	drawn MA	Draft	Map 1 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment		_	Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m, 1.25 m and	Jacobs
SCALE 1:10,000 @ A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wellington 61/3
PROJECT MANAGER	DRAWN MA	Droft	Map 2 of 13	New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment			Coastal Inundation Hazard (Bathtub Map) 1% AFP Storm Tide and RSI R of 0 m 0.4 m 0.65 m 0.85m 1.25 m and	Jacobs
scale 1:10,000	@ A3 IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Welliggter (1/2)
PROJECT MANAGER	DRAWN MA	Draft	Map 3 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369

armin, GEBCO, NOAA , and other contributors



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CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment	Coastal Inundation Hazard (Bathtub Map) 1% AFP Storm Tide and RSI R of 0 m 0.4 m 0.65 m 0.85m 1.25 m and	Jacobs
SCALE 1:10,000 @ A3 IS355300 DD0.ECT MANAGED	1.65 m from 2020	Level 8, 1 Grey Street, Wellington 6143
IW MA PROJECT DIRECTOR DATE BC 12/1/2021	Draft Map 4 of 13 Base Aerial Imagery from 2017	New Zealand T +64 4 473 4265 F +64 4 473 3369



<sup>CLIENT</sup> Kāpiti Coast District Council <sup>PROJECT</sup> Takutai Kapiti Coastal Hazards	Assessment	_	Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m, 1.25 m and	Jacobs
scale 1:10,000 @ A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wellington 61/3
PROJECT MANAGER	DRAWN MA	Droft	Map 5 of 13	New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



<sup>CLIENT</sup> Kāpiti Coast District Council			Coastal Inundation Hazard (Bathtub Map)	<sup>1</sup> ocobo
<sup>PROJECT</sup> Takutai Kapiti Coastal Hazards	Assessment		1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
scale 1:10,000 @A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street,
PROJECT MANAGER	DRAWN MA	Droft	Map 6 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Diall	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment			Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
SCALE 1:10,000 @	A3 PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wallington 61/3
PROJECT MANAGER IW	MA	Draft	Map 7 of 13	New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



CLIENT Kāpiti Coast District Cour PROJECT Takutai Kapiti Coastal Ha	ncil zards Assessment		Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
scale 1:10,000 (	D A3 IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wellington 6143
PROJECT MANAGER IW PROJECT DIRECTOR BC	DRAWN MA DATE 12/1/2021	- Draft	Map 8 of 13 Base Aerial Imagery from 2017	New Zealand T +64 4 473 4265 F +64 4 473 3369



<sub>CLIENT</sub> Kāpiti Coast District Council			Coastal Inundation Hazard (Bathtub Map)	"acaba
PROJECT Takutai Kapiti Coastal Hazards	Assessment		1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
scale 1:10,000 @A3	PROJECT CODE		1.65 m from 2020	Level 8, 1 Grey Street,
PROJECT MANAGER	DRAWN MA	Droft	Map 9 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



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<sup>CLIENT</sup> Kāpiti Coast District Council			Coastal Inundation Hazard (Bathtub Map)	"acaba
PROJECT Takutai Kapiti Coast	al Hazards Assessment		1% AEP Storm Tide and RSLR of 0 m, 0.4 m, 0.65 m, 0.85m, 1.25 m and	Jacobs
scale 1:10,000	@ A3 IS355300		1.65 m from 2020	Level 8, 1 Grey Street,
PROJECT MANAGER	DRAWN MA	Droft	Map 10 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369





CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment			Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs	
scale 1:10,000 @ A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wellington 61/3	
PROJECT MANAGER IW	MA	Droft	Map 11 of 13	New Zealand	
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369	



<sub>CLIENT</sub> Kāpiti Coast District Council			Coastal Inundation Hazard (Bathtub Map)	lacabo
PROJECT Takutai Kapiti Coastal Hazards Assessment			1% AEP Storm Tide and RSLR of 0 m, 0.4 m, 0.65 m, 0.85m, 1.25 m and	Jacobs
scale 1:10,000 @A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street,
PROJECT MANAGER	DRAWN MA	Droft	Map 12 of 13	Wellington 6143, New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



CLIENT Kāpiti Coast District Council PROJECT Takutai Kapiti Coastal Hazards Assessment			Coastal Inundation Hazard (Bathtub Map) 1% AEP Storm Tide and RSLR of 0 m. 0.4 m. 0.65 m. 0.85m. 1.25 m and	Jacobs
scale 1:10,000 @ A3	PROJECT CODE IS355300		1.65 m from 2020	Level 8, 1 Grey Street, Wellington (1/2)
PROJECT MANAGER	MA MA	Draft	Map 13 of 13	New Zealand
PROJECT DIRECTOR BC	DATE 12/1/2021	Dian	Base Aerial Imagery from 2017	T +64 4 473 4265 F +64 4 473 3369



# Appendix F. Beach profiles

# Profile 460 (Ōtaki)



### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	12.14 m	0.66 m/yr	0.79 m/yr	0.35
3m Contour	3.27 m	0.18 m/yr	0.18 m/yr	0.19
Volume Change (above the Om contour)	29.80 m <sup>3</sup>	1.62 m <sup>3</sup> /m/yr	1.82 m <sup>3</sup> /m/yr	0.00



# Profile 450 (Ōtaki)



#### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	3.07 m	0.17 m/yr	0.26 m/yr	0.44
3m Contour	5.98 m	0.33 m/yr	0.40 m/yr	0.66
Volume Change (above the Om contour)	28.57 m <sup>3</sup>	1.56 m <sup>3</sup> /m/yr	1.44 m <sup>3</sup> /m/yr	0.78



# Profile 440 (Te Horo)



### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	12.16 m	0.66 m/yr	1.03 m/yr	0.49
3m Contour	35.31 m	1.92 m/yr	1.81 m/yr	0.56
Volume Change (above the Om contour)	82.11 m <sup>3</sup>	4.47 m <sup>3</sup> /m/yr	5.48 m <sup>3</sup> /m/yr	0.67



# Profile 430 (Te Horo)



#### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	17.08 m	0.93 m/yr	0.80 m/yr	0.82
3m Contour	18.86 m	1.03 m/yr	1.25 m/yr	0.87
Volume Change (above the Om contour)	67.86 m <sup>3</sup>	3.70 m <sup>3</sup> /m/yr	4.01 m <sup>3</sup> /m/yr	0.97



# Profile 420 (Te Horo)



#### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	18.61 m	1.01 m/yr	0.84 m/yr	0.56
3m Contour	3.22 m	0.18 m/yr	0.18 m/yr	0.25
Volume Change (above the Om contour)	31.65 m <sup>3</sup>	1.72 m <sup>3</sup> /m/yr	1.18 m <sup>3</sup> /m/yr	0.51



# Profile 410 (Peka Peka)



### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	0.85 m	0.07 m/yr	0.61 m/yr	0.21
3m Contour	10.13 m	0.78 m/yr	0.78 m/yr	0.86
Volume Change (above the Om contour)	11.52 m <sup>3</sup>	0.89 m³/m/yr	1.63 m <sup>3</sup> /m/yr	0.50



# Profile 400 (Peka Peka)



#### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	4.67 m	0.25 m/yr	0.02 m/yr	0.00
3m Contour	-1.87 m	-0.10 m/yr	-0.01 m/yr	0.00
Volume Change (above the Om contour)	12.64 m <sup>3</sup>	0.69 m <sup>3</sup> /m/yr	0.53 m³/m/yr	0.05



# Profile 380 (Waikanae)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	16.03 m	1.02 m/yr	1.54 m/yr	0.69
3m Contour	0.35 m	0.02 m/yr	0.03 m/yr	0.61
Volume Change (above the Om contour)	26.93 m <sup>3</sup>	1.72 m <sup>3</sup> /m/yr	2.06 m <sup>3</sup> /m/yr	0.89


# Profile 370 (Waikanae)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	20.31 m	1.30 m/yr	2.06 m/yr	0.51
3m Contour	6.32 m	0.40 m/yr	0.45 m/yr	0.88
Volume Change (above the Om contour)	50.25 m <sup>3</sup>	3.21 m <sup>3</sup> /m/yr	3.02 m <sup>3</sup> /m/yr	0.82



# Profile 340 (Paraparaumu)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	17.00 m	0.93 m/yr	0.60 m/yr	0.06
3m Contour	-1.75 m	-0.10 m/yr	0.13 m/yr	0.05
Volume Change (above the Om contour)	0.91 m <sup>3</sup>	0.05 m³/m/yr	0.46 m <sup>3</sup> /m/yr	0.01



# Profile 330 (Paraparaumu)



## Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	2.95 m	0.16 m/yr	0.60 m/yr	0.07
3m Contour	15.49 m	0.84 m/yr	0.59 m/yr	0.34
Volume Change (above the Om contour)	83.74 m <sup>3</sup>	4.56 m <sup>3</sup> /m/yr	4.63 m <sup>3</sup> /m/yr	0.83



# Profile 320 (Paraparaumu)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	29.53 m	1.61 m/yr	0.49 m/yr	0.04
3m Contour	49.38 m	2.69 m/yr	3.20 m/yr	0.80
Volume Change (above the Om contour)	86.04 m <sup>3</sup>	4.69 m <sup>3</sup> /m/yr	2.85 m³/m/yr	0.34



# Profile 310 (Paraparaumu)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	9.69 m	0.53 m/yr	0.57 m/yr	0.19
3m Contour	43.8 m	2.39 m/yr	2.35 m/yr	0.91
Volume Change (above the Om contour)	84.38 m <sup>3</sup>	4.60 m <sup>3</sup> /m/yr	3.98 m³/m/yr	0.86



# Profile 300 (Paraparaumu)



#### **Unmodified Site**

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	46.24 m	2.52 m/yr	2.20 m/yr	0.86
3m Contour	17.98 m	0.98 m/yr	0.92 m/yr	0.87
Volume Change (above the Om contour)	102.10 m <sup>3</sup>	5.56 m <sup>3</sup> /m/yr	5.56 m <sup>3</sup> /m/yr	0.97



# Profile 290 (Raumati)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	11.54 m	1.13 m/yr	1.51 m/yr	0.50
3m Contour	0 m	NA	NA	NA
Volume Change (above the Om contour)	6.19 m <sup>3</sup>	0.61 m <sup>3</sup> /m/yr	0.74 m <sup>3</sup> /m/yr	0.34



## Profile 280 (Raumati)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	-12.28 m	-0.67 m.yr	-0.64 m.yr	0.43
3m Contour	0	NA	NA	NA
Volume Change (above the Om contour)	-14.60 m <sup>3</sup>	-0.64 m <sup>3</sup> /m/yr	-0.56 m <sup>3</sup> /m/yr	0.40



# Profile 270 (Raumati)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	20.81 m	1.26 m/yr	0.85m/yr	0.40
3m Contour	0	NA	NA	NA
Volume Change (above the Om contour)	3.28 m <sup>3</sup>	0.42 m <sup>3</sup> /m/yr	0.33 m <sup>3</sup> /m/yr	0.28



# Profile 260 (Raumati)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	9.81 m	0.53 m/yr	-0.17 m/yr	0.01
3m Contour	0 m	NA	NA	NA
Volume Change (above the Om contour)	5.22 m <sup>3</sup>	0.28 m <sup>3</sup> /m/yr	-0.03 m <sup>3</sup> /m/yr	0.00



# Profile 250 (Raumati)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	11.84 m	0.69 m/yr	0.02 m/yr	0.00
3m Contour	0 m	NA	NA	NA
Volume Change (above the Om contour)	2.14 m <sup>3</sup>	0.13 m <sup>3</sup> /m/yr	-0.09 m <sup>3</sup> /m/yr	0.03



# Profile 240 (Queen Elizabeth Park)



#### Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	9.04 m	0.49 m/yr	0.46 m/yr	0.27
3m Contour	-7.37 m	-0.40 m/yr	-0.27 m/yr	0.61
Volume Change (above the Om contour)	-26.43 m <sup>3</sup>	-1.44 m <sup>3</sup> /m/yr	-1.10 m <sup>3</sup> /m/yr	0.56



# Profile 230 (Paekākāriki)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	10.74 m	0.59 m/yr	0.67 m/yr	0.36
3m Contour	0 m	NA	NA	NA
Volume Change (above the Om contour)	-1.50 m <sup>3</sup>	0.19 m³/m/yr	0.05 m³/m/yr	0.03



# Profile 220 (Paekākāriki)



## Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	7.98 m	0.43 m/yr	-0.10 m/yr	0.00
3m Contour	0	NA	NA	NA
Volume Change (above the Om contour)	-3.46 m <sup>3</sup>	-0.19 m <sup>3</sup> /m/yr	-0.43 m <sup>3</sup> /m/yr	0.07



# Profile 210 (Paekākāriki)



## Unmodified Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	-2.5 m	-0.19 m/yr	0.30 m/yr	0.17
3m Contour	0.3 m	0.02 m/yr	0.01 m/yr	0.19
Volume Change (above the Om contour)	6.34 m <sup>3</sup>	0.49 m³/m/yr	0.63 m³/m/yr	0.50



# Profile 200 (Paekākāriki)



#### Modified (Structured) Site

Profile Changes	Total Change	EPR	LRR	R <sup>2</sup>
Om Contour	0.58 m	0.03 m/yr	0.27 m/yr	0.22
3m Contour	0 m	NA	NA	NA
Volume Change (above the Om contour)	-4.78 m <sup>3</sup>	-0.26 m³/m/yr	-0.32 m³/m/yr	0.20

# Appendix G. Offshore Bathymetric Profiles from Lumsden (2003)

**Jacobs** 



Figure 2.1: Kapiti Coast: Bathymetry as Surveyed July 2000



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Height Relative to Mean Sea Level (Metres)



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Height Relative to Mean Sea Level (Metres)

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Height Relative to Mean Sea Level (Metres)

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Height Relative to Mean Sea Level (Metres)

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Height Relative to Mean Sea Level (Metres)



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## Appendix H. Sediment Budget

#### Introduction

The periodic beach profile database (2000-2018) was used to determine the relationship between beach volume change and horizontal shoreline movement, which could then be inputted into a sediment budget which accounts beach volumes and losses associated with long-term shoreline from the DSAS analysis and theoretical losses from the beach to the nearshore due to SLR over that period.

The sediment budget was constructed in units of m<sup>3</sup>/yr on a cell-by-cell basis using the eight erosion assessment cells, applying estimates in each cell of:

- **'Credits'** Volume of sediment moving into a cell, either from a sediment source (e.g. longshore drift, rivers, offshore);
- 'Sinks' Volumes stored in the beach system by long-term shoreline accretion as determined by the DSAS analysis of aerial imagery and beach profile data. Over the long-term, this sediment is not available to be transferred alongshore into the next cell; and
- **'Losses' or 'Debits'** Sediment leaving the cell either due to net shoreline erosion, or for accreting cells, the theoretical effect of SLR which moves sediment from the onshore profile into the nearshore profile to maintain equilibrium profile shapes to water depth.

To complete the budget, initial longshore supply from the north and river sediment inputs from Tonkin + Taylor (2018) were utilised, which was derived from the sediment budget originally proposed by de Lange (2013) in kt/yr.

The purpose of the analysis was to provide a sensitivity test that the beach responses to SLR under the Bruun Rule were reasonable from a sediment budget perspective, in that the volumes moving between cells could be reasonably explained by the coastal processes operating.

#### **Calculation Method:**

- Initial Credits: Longshore transport from the four large rivers to the north (Whanganui, Whangaehu, Rangitikei and Manawatu Rivers) set at 94,000 m<sup>3</sup>/yr from the Ōtaki River as 11,000 m3/yr and from the Waikanae River as 4,000 m3/yr from Tonkin & Taylor (2018)<sup>18</sup>. The small local inner shelf credits shown in the Tonkin & Taylor (2018) budget were applied to each cell on a pro-rata basis.
- 2. 'Sinks' by net shoreline accretion and 'Losses' by net shoreline erosion' were calculated using the following method:

a) Establish the relationships at each beach profile (23 profiles) between horizontal shoreline movement and volume change from profile records (2000-2018) (Appendix F):

b) Apply this relationship to an averaged shoreline change rate per year from the DSAS analysis of the 70 year aerial imagery record for the transects with the shoreline length represented by each profile c) Multiply the resulting volume accretion rate by the representative shoreline distance to obtain the total shoreline volume change per year for that coast represented by that profile
d) Group the resulting volumes per profile into the relevant cells.

3. Theoretical volume losses due to SLR were calculated by the following methods:

a) For natural (unmodified) coasts; for each profile applying the relationship between volume and horizontal change to the theoretical erosion rate calculated from the Bruun rule for the SLR rate since 1960 (2.74 mm/yr from Bell et al, 2018) and extrapolated alongshore for the representative shoreline length to give a theoretical volume loss across the cell.

b) For areas of shoreline with protection structures, the 2018 beach profile was translated landward by the theoretical retreat rate due to SLR, and the volume difference below the toe of the structure to the MSL contour was extrapolated alongshore by the relevant shoreline distance to give a theoretical volume loss across the cell.

<sup>&</sup>lt;sup>18</sup> Tonkin & Taylor (2018) assumed density of 1.8 t/m<sup>3</sup> to covert kt/yr from de Lange (2013) to m<sup>3</sup>/yr.

4. Transfers between cells were calculated by balancing the budget within each cell by the following equation: Transfers = credits – (sinks + losses). Transfers were assumed to be from north to south in line with the dominant longshore drift direction.

#### **Limitations and Assumptions:**

The assembled sediment budget has the following limitations and assumptions:

This sediment budget relies on the sediment inputs from Tonkin & Taylor (2018), which is derived from de Lange (2013) as being correct. However, there are the following uncertainties with theses volumes:

 a) The longshore transport supply in de Lange (2013) is taken from the bed load supply of the four large rivers to the north (Whanganui, Whangaehu, Rangitikei and Manawatu Rivers) as estimated by Griffith and Glasby (1985), so does not account for credits, sinks or losses along the coast from the river sources to the northern boundary of the Kāpiti Coast District.

b) Tonkin & Taylor (2018) used a bulk density of 1.8 t/m<sup>3</sup> to convert the volumes in de Lange (2013) given in kt/yr to units of m<sup>3</sup>/yr. However, the paper notes that if a submerged bulk density of 1.6t/m<sup>3</sup> is used instead, the inputs would be greater, with longshore transport from the north being an average of 106,000 m<sup>3</sup>/yr and river supply of 12,400 m<sup>3</sup>/yr from the  $\bar{O}$ taki River and 4,500 m<sup>3</sup>/yr from the Waikanae River.

c) De Lange (2013) indicates that the longshore drift supply from north could be  $\pm$ 40% of the estimated volume, therefore, combined with point b) above, the longshore transport supply from north could be  $\pm$ 45,000 m<sup>3</sup>/yr of the stated figure.

- This sediment budget assumes there are no additional sediment losses to the inner shelf, which from the coastal processes' literature suggest are assumed to be occurring, both to the Rauoterangi channel from around the apex of the cuspate foreland, and onto the nearshore sand bank from Raumati to Paekākāriki. Consideration of these losses into the budget would indicate that supply volumes are greater than stated.
- The sediment budget assumes shoreline transport is north to south along the entire shoreline, however, there is potential that there could be some south to north sediment transport at the southern end of the district at Queen Elizabeth Park and Raumati which is not included in the budget. De Lange (2013) considers this to be sediment from the north re- circulated on the flat nearshore platform rather than fresh sediment supply from south of Paekākāriki.
- The short and intermittent record of the profile data used to calculate trends in beach volume change, and uncertainties in extrapolating these changes over the shoreline length represented by each profile due to the poor spatial resolution of the profile network. The occurrence of storm events which are likely to have resulted in erosion episodes within the 18-year survey period is unknown at this time.
- There are different methods for calculating the theoretical volume losses due to SLR for modified and natural coasts. Sensitivity testing between the two methods revealed that when the method used for modified coasts (i.e. translation of the profile landward by theoretical erosion distance) was applied to the unmodified cells, the results were variable, some displaying less and some more theoretical losses than the extrapolation of profile relationship method. Over the entire coast, the theoretical translation of the profile method resulted in increased losses by 20% (around 5000 m<sup>3</sup>/yr or 0.12 m/m<sup>3</sup>/yr). Nearly all of this can be accounted for by the differences between methods obtained from the Pek Peka Cell, with three of the other cells having differences of less than 10%.
- The sediment transfers between cells have not been validated by theoretical sediment transport formula calculated from the wave climate at each cell boundary.

#### Summary of findings:

The following points can be made from the sediment budget:

 For the northern cells from Ōtaki to Paraparaumu, the sediment budget fits with our observations of coastal processes, that there is sufficient 'credit' from longshore sediment arriving at the northern end of the district to allow for measured beach accretion to occur despite some losses due to the historical rate of SLR.

- The measured accretion volumes totalled across these cells (average 82,900 m3/yr) are more than two
  orders of magnitude greater than assumed by Gibb (1978) (1.2kt/yr, equivalent to 666 750 m3/yr),
  suggesting that this this early figure is far too low and should not be used.
- The longshore variation in accretion rate approaching (Peka Peka cell average +0.48 m<sup>3</sup>/m/yr) and around the cuspate foreland (Waikanae cell average +4.8 m<sup>3</sup>/m/yr and Paraparaumu average +1.9 m<sup>3</sup>/yr) are consistent with our understanding of effect of the wave shadow of Kāpiti Island reducing wave energy, resulting in reduced longshore transport and increased accretion to form the cuspate foreland feature.
- The accretion volumes are 75% of the stated total sediment supply volumes, clearly indicating the lack of sediment supply to the southern cells from Raumati to Paekākāriki. Even if supply volumes were the maximum of the uncertainty range from the limitations above (e.g. 154,000 m<sup>3</sup>/yr), the accretion volume from Ōtaki to Paraparaumu would still be greater than 50%, and as also indicated in the limitations, there are unspecified losses into the Rauoterangi channel from around the apex of the cuspate foreland such that the budget would still show compromised supply to the southern cells.
- The small accretion along the Raumati cell is negligible when expressed as per metre length of beach (0.06 m<sup>3</sup>/m/yr), but is surprising with the 18-year survey record showing the beach volume in front of the seawalls and the MSL contour position being in a general state of dynamic equilibrium rather than a trend of net loss despite beach elevations at the sea wall showing generally net small decreases (up to 0.35 m over 18-year record).
- The high erosion losses along Queen Elizabeth Park (average 2.35 m<sup>3</sup>/m/yr) reflects the lack of sediment supply to the cell from the combined effects of; trapping on the cuspate foreland, the Raumati seawalls truncating natural upper beach transfers, and sediment deposition onto the nearshore bar from SLR. This inconsistency would be addressed by an increased initial longshore transport supply being applied at the northern end of the district, as per the range indicated by de Lange (2013).
- The truncated beach in front of the Paekākāriki sea walls displays net erosion, but at very low rates of 0.21 m<sup>3</sup>/m/yr with beach lowering at the seawall being evident at some profiles.

It is noted that in the future, the rate of SLR will increase, which under the Bruun rule will result in more losses to the nearshore to maintain equilibrium profile shapes. Therefore, for currently accreting cells, sediment will be taken from the sediment 'sink', to such time as the cell moves into a state of net erosion. For currently eroding cells the rate of retreat will need to accelerate to accommodate the additional volume required to be transported to the nearshore to maintain the equilibrium profile shapes.

It is also noted that during erosion phases, the presence of hard engineering solutions such as seawalls stops the supply of sediment from dune erosion from the backshore. This can exacerbate shoreline changes at adjacent shorelines which were reliant on this sediment source. This is an important factor to consider going forward in mitigating the erosion options for effected areas and analysing the downstream effects of those measures.

# Kāpiti Coast Sediment Budget





## Appendix I. Probability Distribution tables

Table I.1 Probability Distribu	itions for Short-term, Dune S	tability and Long-term	

		SI	hort-term (r	n)	Du	ne Stability	(m)	Loi	ng-term (m	/yr)
Cell	Transects	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound
	764-705	-15.0	-10.0	-5.0	-3.5	-2.7	-2.2	0.4	1.1	1.7
ā	704-688	-15.0	-10.0	-5.0	-3.5	-2.7	-2.2	-4.2	0.6	5.4
Otaki	687-665	-15.0	-10.0	-5.0	-3.5	-2.7	-2.2	0.3	0.6	0.8
	664-637	-15.0	-10.0	-5.0	-4.3	-3.4	-2.7	0.2	0.5	0.8
	636-626	-15.0	-10.0	-5.0	N/A	N/A	N/A	-1.6	2.4	6.4
Te Horo	625-611	-15.0	-10.0	-5.0	N/A	N/A	N/A	-0.7	0.5	1.7
	610-571	-15.0	-10.0	-5.0	N/A	N/A	N/A	0.2	0.4	0.6
	570-538	-15.0	-10.0	-5.0	N/A	N/A	N/A	0.3	0.6	0.8
	537-464	-15.0	-10.0	-5.0	-3.8	-3.2	-2.7	0.4	0.8	1.1
Peka Peka	463-412	-15.0	-10.0	-5.0	-3.5	-2.5	-2.1	0.1	0.3	0.6
	411-377	-15.0	-10.0	-5.0	-4.0	-3.1	-2.3	0.3	0.4	0.6
Waikanao	370-343	-7.5	-5.0	-2.5	-4.0	-3.4	-2.9	0.3	0.5	0.8
waikanae	342-323	-7.5	-5.0	-2.5	-4.6	-3.8	-3.1	0.0	0.4	0.8
	318-311	-7.5	-5.0	-2.5	-4.4	-3.6	-3.1	-0.5	0.2	1.0
	310-305	-7.5	-5.0	-2.5	-4.0	-3.5	-3.1	-0.5	-0.3	0.0
Paraparaumu	304-302	-7.5	-5.0	-2.5	-4.0	-3.5	-3.1	-0.5	-0.2	0.0
	301-294	-7.5	-5.0	-2.5	-2.8	-2.3	-1.8	0.3	0.5	0.8
	293-284	-7.5	-5.0	-2.5	-3.0	-2.5	-2.0	1.0	1.3	1.6
	283-272	-7.5	-5.0	-2.5	-3.3	-2.4	-1.9	0.6	0.9	1.2
	271-254	-7.5	-5.0	-2.5	-2.7	-2.3	-2.0	0.2	0.4	0.7
	253-241	-22.5	-15.0	-7.5	-3.3	-2.5	-2.1	0.17	0.33	0.50
	240-216	-22.5	-15.0	-7.5	-8.1	-3.0	-1.5	0.08	0.17	0.25
	215-193	-22.5	-15.0	-7.5	-6.8	-4.5	-1.5	-0.21	-0.14	-0.07
Raumati	192-174	-22.5	-15.0	-7.5	-11.3	-7.2	-3.6	-0.23	-0.16	-0.08
	173-169	-22.5	-15.0	-7.5	-11.3	-7.2	-3.6	-0.35	-0.23	-0.12
	168-163	-22.5	-15.0	-7.5	-8.9	-5.5	-4.1	-0.35	-0.24	-0.12
	162-153	-22.5	-15.0	-7.5	-8.9	-5.5	-4.1	-0.31	-0.21	-0.10
OEII Park	152-126	-15.0	-10.0	-5.0	-4.2	-2.9	-2.2	-0.6	-0.4	-0.1
	125-85	-15.0	-10.0	-5.0	-4.2	-2.9	-2.2	-0.3	-0.2	-0.1
	84-82	-7.5	-5.0	-2.5	-3.8	-3.1	-2.1	0.2	0.3	0.4
	81-77	-7.5	-5.0	-2.5	-3.8	-3.1	-2.1	-0.1	-0.1	0.0
	76-59	-7.5	-5.0	-2.5	-3.8	-3.1	-2.1	-0.1	-0.1	0.0
	58-49	-7.5	-5.0	-2.5	-7.8	-6.7	-5.8	-0.2	-0.1	-0.1
Paekākāriki	48-44	-7.5	-5.0	-2.5	-7.8	-6.7	-5.8	-0.2	-0.1	-0.1
	43-39	-7.5	-5.0	-2.5	-7.8	-6.7	-5.8	-0.2	-0.2	-0.1
	38-32	-7.5	-5.0	-2.5	-19.1	-14.3	-10.2	-0.3	-0.2	-0.1
	31-25	-7.5	-5.0	-2.5	-19.1	-14.3	-10.2	-0.3	-0.2	-0.1
	24-15	-7.5	-5.0	-2.5	-3.5	-2.9	-2.1	-0.1	-0.1	0.0

### Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment Volume 2: Results



		S	hort-term (r	n)	Du	ne Stability	(m)	Long-term (m/yr)				
Cell	Transects	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound		
	14-0	-7.5	-5.0	-2.5	-3.5	-2.9	-2.1	-0.1	-0.1	0.0		

#### Table I.2 Probability Distributions for SLR to 2050 and 2070

	Transects	Structure Residual Life <sup>1</sup>	Upper Bound         Mean         Lower Bound           -10.3         -10.0         -9.3           -10.3         -10.0         -9.3           -10.3         -10.0         -9.3           -10.3         -10.0         -9.3           -10.3         -10.0         -9.3           -10.2         -10.0         -9.3           -10.2         -10.0         -9.3           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -5.6         -2.2           -9.0         -7.3         -4.8           -10.3         -9.7         -9.3           -8.9         -8.8         -8.5           -7.7         -7.4         -7.1           -7.8         -4.6		(m)	0.4m SLR 2050 (m)			0.3	m SLR 2070	(m)	0.7m SLR 2070 (m)			
Cell			Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	
	764-705		-10.3	-10.0	-9.3	-27.5	-26.8	-24.9	-14.3	-13.9	-12.9	-48.7	-47.4	-44.0	
Ōtali	704-688		-10.3	-10.0	-9.3	-27.5	-26.8	-24.9	-14.3	-13.9	-12.9	-48.7	-47.4	-44.0	
Olaki	687-665		-10.3	-10.0	-9.3	-27.5	-26.8	-24.9	-14.3	-13.9	-12.9	-48.7	-47.4	-44.0	
	664-637		-10.2	-10.0	-9.3	-27.3	-26.7	-24.9	-14.2	-13.9	-13.0	-48.4	-47.3	-44.1	
	636-626		-9.0	-5.6	-2.2	-24.0	-14.9	-5.8	-12.5	-7.7	-3.0	-42.5	-26.3	-10.3	
Tallana	625-611		-9.0	-5.6	-2.2	-24.0	-14.9	-5.8	-12.5	-7.7	-3.0	-42.5	-26.3	-10.3	
Te Horo	610-571		-9.6	-7.3	-4.8	-25.5	-19.4	-12.9	-13.3	-10.1	-6.7	-45.1	-34.4	-22.9	
	570-538	No Structures	-10.9	-9.6	-8.1	-29.0	-25.7	-21.7	-15.1	-13.4	-11.3	-51.4	-45.5	-38.4	
	537-464	Structures	-8.9	-8.7	-8.5	-23.9	-23.1	-22.6	-12.4	-12.0	-11.8	-42.2	-40.9	-40.0	
Peka Peka	463-412		-10.3	-9.7	-9.3	-27.3	-26.0	-24.9	-14.2	-13.5	-12.9	-48.4	-46.0	-44	
	411-377		-8.9	-8.8	-8.5	-23.7	-23.4	-22.7	-12.3	-12.2	-11.8	-42.0	-41.4	-40.2	
147 1	370-343		-7.7	-7.7	-7.4	-20.7	-20.5	-19.8	-10.8	-10.7	-10.3	-36.6	-36.3	-35.1	
waikanae	342-323		-7.5	-7.4	-7.1	-20.0	-19.7	-18.9	-10.4	-10.3	-9.8	-35.4	-34.9	-33.4	
	318-311		-4.8	-4.6	-4.5	-12.7	-12.2	-11.9	-6.6	-4.5	-4.3	-24.5	-23.6	-22.9	
	310-305		-5.9	-5.7	-5.6	-15.7	-15.3	-14.8	-8.2	-7.9	-7.7	-27.7	-27.0	-26.3	
	304-302	10	-4.9	-4.8	-4.7	-11.1	-11.0	-10.6	-8.2	-8.1	-7.8	-22.2	-21.9	-21.2	
Paraparaumu	301-294		-5.9	-5.7	-5.6	-15.7	-15.3	-14.8	-8.2	-7.9	-7.7	-27.7	-27.0	-26.3	
	293-284	No	-6.2	-5.5	-4.9	-16.6	-14.6	-13.1	-8.6	-7.6	-6.8	-29.4	-25.9	-23.2	
	283-272	Structures	-5.5	-5.4	-5.3	-14.6	-14.3	-14.2	-7.6	-7.4	-7.4	-25.8	-25.3	-25.1	
	271-254		-7.1	-6.9	-6.8	-18.9	-18.3	-18.3	-9.8	-9.5	-9.5	-33.4	-32.4	-32.4	

Jacobs
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	253-241	10	-14.9	-14.8	-14.4	-33.8	-33.7	-32.7	-25.0	-24.9	-24.2	-67.6	-67.3	-65.4
	240-216	10	-15.3	-14.2	-10.0	-34.7	-32.4	-22.8	-25.7	-23.9	-16.9	-69.5	-64.7	-45.6
	215-193	10	-20.0	-15.3	-13.5	-45.6	-34.9	-30.8	-33.7	-25.8	-22.8	-91.1	-69.7	-61.6
Raumati	192-174	10	-18.0	-15.5	-11.9	-40.9	-35.2	-27.0	-30.3	-26.0	-20.0	-81.9	-70.4	-54.0
	173-169	20	-10.4	-9.0	-6.9	-24.8	-21.3	-16.3	-22.7	-19.5	-15.0	-65.7	-56.5	-43.3
	168-163	20	-8.8	-7.4	-2.9	-20.0	-16.9	-6.5	-20.8	-17.6	-6.8	-60.0	-50.8	-19.5
	162-153	10	-17.6	-14.9	-5.7	-40.0	-33.9	-13.0	-29.6	-25.0	-9.6	-80.0	-67.7	-26.0
Queen Elizabeth	152-126		-18.0	-17.6	-7.3	-47.9	-46.8	-19.5	-24.9	-24.4	-10.2	-84.8	-83.0	-34.5
Park	125-85	No	-18.0	-17.6	-7.3	-47.9	-46.8	-19.5	-24.9	-24.4	-10.2	-84.8	-83.0	-34.5
	84-82		-9.7	-7.9	-7.8	-25.8	-21.2	-20.9	-13.4	-11.0	-10.9	-45.8	-37.6	-37.0
	81-77	30	0.0	0.0	0.0	0.0	0.0	0.0	-6.9	-5.7	-5.6	-23.1	-18.9	-18.6
	76-59	30	0.0	0.0	0.0	0.0	0.0	0.0	-6.9	-5.7	-5.6	-23.1	-18.9	-18.6
	58-49	30	0.0	0.0	0.0	0.0	0.0	0.0	-5.5	-4.4	-4.3	-18.4	-14.7	-14.3
	48-44	10	-8.1	-6.5	-6.3	-18.4	-14.7	-14.3	-13.6	-10.8	-10.6	-36.9	-29.3	-28.6
Paekākāriki	43-39	20	-4.7	-3.7	-3.6	-11.2	-8.9	-8.6	-10.2	-8.1	-7.9	-29.6	-23.5	-22.9
	38-32	10	-5.1	-4.3	-3.4	-11.6	-9.7	-7.8	-8.6	-7.2	-5.8	-23.2	-19.4	-15.6
	31-25	No Structures	-4.9	-4.1	-3.3	-13.0	-10.9	-8.7	-6.8	-5.7	-4.5	-23.0	-19.3	-15.4
	24-15	10	-8.7	-8.2	-7.8	-19.7	-18.7	-17.8	-14.6	-13.9	-13.2	-39.4	-36.2	-34.4
	14-0	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<sup>1</sup> Structure Residual L	ife based on Ton	kin and Taylor 20 <sup>-</sup>	16 & 2021 st	ructure data	bases.									

#### Table I.3 Probability Distributions for SLR to 2120

	Transect	Structure Residual Life <sup>1</sup>	0.6	5m SLR 2120	(m)	0.8	5m SLR 2120	) (m)	1.2	5m SLR 2120	(m)	1.65m SLR 2120 (m)			
Cell			Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	
	764-705		-28.7	-27.9	-25.9	-50.2	-48.8	-45.3	-84.6	-82.3	-76.4	-119.0	-115.8	-107.4	
Ōtali	704-688		-28.7	-27.9	-25.9	-50.2	-48.8	-45.3	-84.6	-82.3	-76.4	-119.0	-115.8	-107.4	
Utaki	687-665		-28.7	-27.9	-25.9	-50.2	-48.8	-45.3	-84.6	-82.3	-76.4	-119.0	-115.8	-107.4	
	664-637		-28.4	-27.8	-25.9	-49.8	-48.7	-45.4	-84.0	-82.1	-76.5	-118.1	-115.5	-107.6	
	636-626		-25.0	-15.5	-6.1	-43.8	-27.1	-10.6	-73.8	-45.7	-17.9	-103.8	-64.3	-25.2	
<b>T</b> 11	625-611		-25.0	-15.5	-6.1	-43.8	-27.1	-10.6	-73.8	-45.7	-17.9	-103.8	-64.3	-25.2	
Te Horo	610-571		-26.5	-20.2	-13.4	-46.4	-35.4	-23.5	-78.3	-59.7	-39.7	-110.2	-84.0	-55.8	
570	570-538	No	-30.2	-26.7	-22.6	-52.9	-46.8	-39.5	-89.1	-78.9	-66.6	-125.4	-111.0	-93.7	
537-464	537-464		-24.8	-24.1	-23.5	-43.5	-42.1	-41.2	-73.3	-71.0	-69.4	-103.1	-99.9	-97.7	
Peka Peka	463-412	-	-28.5	-27.1	-25.9	-50.0	-47.5	-45.4	-84.0	-79.9	-76.4	-118.2	-112.4	-107.4	
	411-377		-24.7	-24.3	-23.6	-43.2	-42.6	-41.4	-72.9	-71.9	-69.7	-102.6	-101.1	-98.1	
14/ ·1	370-343		-21.5	-21.4	-20.6	-37.6	-37.4	-36.1	-63.5	-63.0	-60.9	-89.3	-88.7	-85.6	
Waikanae	342-323		-20.8	-20.5	-19.6	-36.4	-35.9	-34.4	-61.4	-60.5	-58.0	-86.4	-85.2	-81.6	
	318-311	-	-13.3	-12.7	-12.4	-23.2	-22.3	-21.7	-39.1	-37.6	-36.5	-55.1	-52.9	-51.4	
	310-305	-	-16.3	-15.9	-15.4	-22.7	-22.4	-21.6	-48.1	-46.9	-45.6	-67.7	-66.0	-64.1	
	304-302	10	-18.5	-18.2	-17.6	-22.7	-22.4	-21.6	-50.0	-49.3	-47.7	-57.7	-57.0	-55.1	
Paraparaumu	301-294		-16.3	-15.9	-15.4	-28.5	-27.8	-27.0	-48.1	-46.9	-45.6	-67.7	-66.0	-64.1	
	293-284	No	-17.3	-15.2	-13.7	-30.2	-26.6	-23.9	-51.0	-44.9	-40.3	-71.7	-63.2	-56.7	
	283-272	Structures	-15.2	-14.9	-14.7	-26.5	-26.0	-25.8	-44.7	-43.9	-43.5	-62.9	-61.8	-61.2	
	271-254	]	-19.6	-19.1	-19.0	-34.4	-33.4	-33.3	-58.0	-56.2	-56.2	-81.6	-79.1	-79.0	
	253-241	10	-56.2	-56.0	-54.4	-83.5	-83.1	-80.8	-110.9	-110.4	-107.4	-175.8	-175.0	-170.1	
Raumati	240-216	10	-57.8	-53.9	-37.9	-85.8	-79.9	-56.3	-114.0	-106.2	-74.8	-180.7	-168.3	-118.5	



	215-193	10	-75.8	-58.0	-51.2	-112.5	-86.1	-76.0	-149.5	-114.4	-101.0	-237.0	-181.3	-160.1
	192-174	20	-68.1	-58.5	-44.9	-101.1	-86.9	-66.7	-134.3	-115.4	-88.6	-212.8	-182.9	-140.4
	173-169	30	-60.5	-52.0	-39.9	-92.1	-60.6	-46.5	-129.0	-110.9	-85.1	-196.7	-169.0	-129.7
	168-163	20	-57.7	-48.9	-18.8	-87.8	-74.4	-28.6	-124.3	-105.2	-40.4	-187.9	-159.2	-61.1
	162-153	20	-66.5	-56.3	-21.6	-98.7	-83.6	-32.1	-131.2	-111.1	-42.7	-207.9	-176.1	-67.6
Queen	152-126		-49.9	-48.8	-20.3	-86.6	-84.6	-26.6	-147.2	-143.9	-59.9	-207.1	-202.5	-84.3
Elizabeth Park	125-85	No Structures	-49.9	-48.8	-20.3	-86.6	-84.6	-26.6	-147.2	-143.9	-59.9	-207.1	-202.5	-84.3
	84-82		-26.9	-22.1	-21.7	-51.1	-42.0	-41.3	-79.4	-65.2	-64.2	-111.7	-91.7	-90.3
	81-77	30	-28.2	-23.2	-22.8	-44.4	-36.4	-35.9	-80.7	-66.3	-65.3	-96.9	-79.5	-78.3
	76-59	50	-28.2	-23.2	-22.8	-44.4	-36.4	-35.9	-80.7	-66.3	-65.3	-96.9	-79.5	-78.3
	58-49	30	-22.6	-18.0	-17.5	-35.5	-20.5	-20.0	-64.5	-51.4	-50.0	-77.4	-61.6	-60.0
	48-44	10	-30.7	-24.4	-23.8	-45.5	-36.2	-35.3	-83.0	-66.0	-64.3	-95.9	-76.3	-74.3
Paekākāriki	43-39	20	-27.3	-21.7	-21.1	-41.5	-33.0	-32.1	-75.7	-60.2	-58.6	-88.6	-70.5	-68.6
	38-32	10	-19.3	-16.1	-13.0	-28.6	-24.0	-19.2	-52.1	-43.7	-35.0	-60.3	-50.5	-40.5
	31-25	No Structures	-13.5	-11.3	-9.1	-23.7	-19.8	-15.9	-39.9	-33.4	-26.8	-56.1	-47.0	-37.7
	24-15	10	-32.7	-31.2	-29.6	-48.6	-46.3	-44.0	-88.6	-83.0	-78.9	-102.3	-96.1	-91.4
	14-0	5	-18.2	-17.3	-16.5	-26.8	-25.5	-24.3	-49.2	-46.8	-44.5	-63.0	-60.0	-57.0
<sup>1</sup> Structure Res	idual Life base	d on Tonkin a	nd Taylor 20	16 & 2021 str	ucture databa	ses.								



## Appendix J. Raw Coastal Erosion Distances for Projected Future Shoreline Positions

#### Table J.1: Raw Coastal Erosion Distances 2050

				0.2m R	SLR 2050					0.4m R	SLR 2050		
		F	210	F	233	Р	66	Р	10	Р	33	Р	66
	Transect												
Coastal Cell	Group	Range (m)	Average (m)										
	764-713	-9.8 to 20.9	-1.7	-6.2 to 48.1	4.7	-2.5 to 74.7	11.3	-26.5 to 5.2	-18.2	-22.8 to 31.5	-11.8	-19.1 to 58.4	-5.2
Ōtaki	682-665	-20.7 to -5.3	-15.7	-18.4 to -2.1	-13.0	-16.2 to 1.4	-10.2	-37.2 to -21.7	-32.2	-34.9 to -18.4	-29.5	-32.5 to -15.1	-26.7
	664-638	-21.5 to 0.7	-13.2	-19.2 to 8.3	-9.6	-16.9 to 18.2	-5.9	-38.1 to -15.4	-29.7	-35.7 to -7.9	-26.1	-33.3 to 1.6	-22.3
	636-626	-29.9 to 31.6	-9.4	-2.2 to 95.6	34.4	12.9 to 168.4	77.8	-37.8 to 21.7	-18.8	-11.1 to 85.7	24.6	4 to 157.4	68.2
	625-611	-85.1 to -0.5	-20.3	-47 to 6.3	-7.2	-23.1 to 57.3	6.0	-93.7 to -10.9	-30.4	-55.9 to -3.4	-16.9	-31.8 to 47.9	-3.1
Te Horo	610-571	-14.4 to -5.3	-10.4	-12.1 to -1.3	-7.6	-9.9 to 2.8	-4.7	-27.5 to -18.0	-23.4	-24.6 to -13.6	-20.0	-21.6 to -9.0	-16.4
	570-557	-15.6 to -0.6	-10.8	-13.4 to 3.1	-8.3	-11.1 to 7.1	-5.7	-31.9 to -16.9	-27.1	-29.5 to -12.9	-24.3	-24.3 to -4.7	-18.6
	537-469	-12.8 to 10.9	-5.7	-10.8 to 20.4	-1.6	-8.6 to 34.3	2.6	-27.5 to -3.6	-20.2	-25.4 to 6.3	-16.1	-23.1 to 20.6	-7.6
Peka Peka	455-412	-18.7 to -11.8	-15.4	-16.4 to -9.3	-13.1	-13.9 to -6.6	-10.6	-35.2 to -28.2	-31.8	-32.8 to -25.6	-29.4	-28.0 to 20.2	-24.5
	411-379	-16.2 to -10.0	-12.1	-13.6 to -7.7	-9.8	-11.1 to 5.4	-7.4	-30.7 to -24.6	-26.7	-28.2 to -22.3	-24.4	-25.6 to -19.9	-19.5
	363-343	-11.1 to -5.9	-7.4	-8.5 to -3.9	-5.4	-5.7 to -1.8	-3.2	-23.9 to -18.6	-20.1	-21.2 to -16.6	-18.1	-16.2 to -12.4	-13.8
waikanae	342-324	-11.7 to -8.1	-10.0	-8.5 to -2.4	-5.9	-5.8 to 3.6	-1.7	-23.7 to -20.2	-22.2	-20.6 to -14.4	-18.1	-18.0 to -8.5	-13.9
	314-311	-23.0 to -16.9	-20.1	-19.3 to -10.7	-15.3	-15.6 to -4.4	-10.4	-30.6 to -24.6	-27.8	-26.9 to -18.4	-23.0	-23.2 to -12.0	-18.1
	310-305	-28.0 to -25.5	-26.9	-25.1 -22.2	-23.9	-22.0 to -18.8	-20.8	-37.6 to -35.0	-36.5	-34.6 to -31.7	-33.5	-31.5 to -28.4	-30.4
	304-302	-26.7 to -23.1	-24.9	-23.7 to -20.6	-22.1	-20.6 to -17.8	-19.1	-32.7 to -29.3	-31.0	-29.7 to -26.6	-28.1	-26.6 to -23.8	-25.2
Paraparaumu	301-294	-22.9 to 24.3	-2.1	-20.2 to 27.3	0.9	-17.5 to 30.4	3.9	-32.5 to 14.8	-11.7	-29.8 to 17.8	-8.7	-27.1 to 21.0	-5.6
	293-284	14.6 to 27.2	21.3	18.6 to 30.4	24.6	22.7 to 33.7	28.1	5.4 to 17.9	12.0	9.4 to 21.1	15.4	13.5 to 24.5	18.8
	283-275	7.0 to 13.7	9.9	10.5 to 17.8	13.9	13.9 to 22.0	17.9	-1.9 to 4.6	1.0	1.5 to 8.8	4.9	5.0 to 13	8.9
	269-254	-13.4 to 0.8	-7.0	-9.8 to 3.8	-4.1	-6.1 to 7.5	-1.0	-24.9 to -10.8	-18.6	-21.3 to -7.7	-15.6	-17.6 to -4.6	-12.6
	253-241	-30.7 to -29.7	-30.2	-27.8 to -26.8	-27.3	-24.9 to -23.7	-24.3	-49.4 to -48.4	-48.9	-46.6 to -45.5	-46.0	-43.6 to -42.4	-43.0
Raumati	240-220	-35.7 to -30.3	-33.9	-32.5 to -27.1	-30.8	-29.3 to -23.7	-27.6	-53.3 to -47.8	-51.5	-49.7 to -44.2	-47.9	-46.0 to -40.3	-44.2
	213-193	-45.0 to -40.5	-43.3	-42.0 to -37.5	-40.2	-38.6 to -34.4	-37.0	-67.1 to -62.5	-65.3	-63.0 to -58.6	-61.3	-59.0 to -54.6	-57.3

				0.2m R	SLR 2050					0.4m RS	SLR 2050		
		P	10	Р	33	Р	66	Р	10	Р	33	P	66
Coastal Cell	Transect Group	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)
	192-174	-47.2 to -44.4	-45.4	-43.9 to -41.3	-42.3	-40.6 to -38.0	-39.0	-67.3 to -64.7	-65.7	-63.5 to -60.9	-61.9	-59.5 to -57.0	-57.9
	173-169	-38.2 to -38.0	-38.1	-35.1 to -34.9	-35.0	-31.9 to -31.9	-31.9	-50.6 to -50.4	-50.5	-47.3 to -47.1	-47.2	-43.8 to -43.8	-43.8
	168-163	-34.5 to -34.4	-34.5	-31.5	-31.5	-28.5 to -28.3	-28.4	-43.6 to -43.5	-43.6	-40.0 to -41.0	-40.1	-36.2 to -36.3	-36.2
	162-153	-44.2 to -43.1	-43.5	-40.7 to -39.7	-40.0	-36.9 to -35.9	-36.3	-63.3 to -62.2	-62.6	-58.4 to -57.3	-57.7	-52.4 to -51.3	-51.8
Queen Elizabeth	152-132	-63.5 to -40.2	-48.4	-59.3 to -37	-44.6	-55.1 to -33.5	-40.6	-90.5 to -67.9	-75.7	-85.0 to -63	-70.4	-77.9 to -56.2	-63.4
Park	122-89	-39.3 to -35.6	-37.5	-36.5 to -33.1	-34.8	-33.4 to -30.1	-31.8	-67.2 to -63.6	-65.3	-62.8 to -59.3	-61.0	-56.1 to-52.7	-54.4
	82	-9.4 to -9.4	-9.4	-8.1 to -8.1	-8.1	-6.7 to -6.7	-6.7	-23.9 to-23.9	-23.9	-22.3 to -22.3	-22.3	-20.6 to -20.6	-20.6
	81-77	-9.4 to -9.4	-9.4	-8.5 to -8.4	-8.5	-7.5 to -7.5	-7.5	-9.4 to-9.4	-9.4	-8.5 to -8.5	-8.5	-7.5 to -7.5	-7.5
	76-59	-9.5 to -9.4	-9.4	-8.5 to -8.5	-8.5	-7.5 to -7.5	-7.5	-9.4 to -9.4	-9.4	-8.5 to -8.5	-8.5	-7.5 to -7.5	-7.5
	58-49	-13.2 to -13.2	-13.2	-12.3 to -12.2	-12.3	-11.3 to -11.3	-11.3	-13.2 to -13.2	-13.2	-12.3 to -12.2	-12.3	-11.3 to -11.2	-11.3
	48-44	-23.0 to -23.0	-23.0	-21.9 to -21.9	-21.9	-20.8 to -20.7	-20.8	-32.3 to -32.2	-32.2	-30.9 to -30.8	-30.8	-29.5 to -29.5	-29.5
Paekākāriki	43-39	-18.8 to -18.8	-18.8	-17.8 to -17.8	-17.8	-16.8 to -16.8	-16.8	-24.5 to -24.5	-24.5	-23.4 to -23.4	-23.4	-22.3 to -22.3	-22.3
	38-32	-30.8 to-29.6	-30.1	-28.8 to -27.8	-28.2	-26.9 to -25.8	-26.3	-36.4 to -35.2	-35.7	-34.3 to -33.2	-33.7	-32.2 to -31.2	-31.7
	31-25	-35.0 to -29.5	-31.6	-32.7 to -27.5	-29.6	-30.4 to -25.7	-27.5	-42.0 to -36.4	-38.6	-39.6 to -34.3	-36.5	-37.2 to -32.3	-34.3
	24-15	-20.3 to -19.1	-19.3	-19.3 to -18.31	-18.3	-18.2 to -17.2	-17.3	-30.8 to -29.7	-29.8	-29.8 to -28.7	-28.8	-28.7- 27.6	-27.8
	14-0	-9.3 to -9.2	-9.2	-8.3 to -8.3	-8.3	7.4 to -7.3	-7.4	-9.3 to -9.2	-9.2	-8.4 to -8.3	-8.3	-7.4 to -7.3	-7.4

#### Table J.2: Raw Coastal Erosion Distances 2070

				0.3m RSLF	R 2070					0.7m RSLR 20	070		
		P10		P33		P66		P10		P33		P66	
Coastal Cell	Transect Group	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)
	764-713	-5.1 to 45.8	9.0	1 to 90.7	19.4	6.8 to 135.1	29.8	-38.5 to 14.2	-24.0	-32 to 58.8	-13.6	-26.2 to 102.2	-3.1
Ōtaki	682-665	-21.9 to 3.3	-13.8	-19.0 to 8.2	-10.0	-15.9 to 13.3	-6.0	-55.1 to -29.8	-46.9	-52 to -27.4	-43.0	-48.9 to -19.7	-39.0
	664-638	-22.9 to 13.2	-9.3	-20 to 25.9	-3.9	-17 to 41.8	1.6	-55.9 to -18.8	-42.3	-53 to -6.5	-36.8	-49.9 to 9.4	-31.3
	636-626	-40.4 to 59.7	-7.9	5 to 166.6	65.3	30 to 289.1	137.7	-59.7 to 42.8	-25.8	-13.5 to 150.2	47.5	11.1 to 270.2	119.3
	625-611	-132.2 to 8.0	-25.4	-69.7 to 19.0	-3.6	-30.0 to 104.1	18.1	-155 to -13.1	-45.7	-89.8 to -0.2	-23.3	-47.8 to 82.6	-0.3
le Horo	610-571	-13.8 to 0.6	-7.5	-11.1 to 6.8	-3.6	-8.3 to 13.1	0.5	-40.8 to -25.1	-33.9	-36.3 to -17.8	-28.5	-31.5 to -10.5	-22.9
	570-557	-15.4 to 8.8	-7.5	-12.5 to 14.7	-4.1	-9.6 to 20.8	-0.5	-48.4 to -23.6	-40.2	-44.7 to -17.6	-36.2	-41.0 to -10.9	-32.0
	537-469	-9 to 29.7	2.6	-6.4 to 45.6	8.9	-3.7 to 69	15.3	-37.9 to 0.7	-26.4	-35.3 to 16.4	-20.1	-32.6 to 39.7	-13.7
Peka Peka	455-412	-18.9 to -7.4	-13.3	-15.8 to -3.9	-10.2	12.6 to -0.1	-6.9	-51.7 to -40.3	-46.1	-48.4 to -36.6	-42.9	-45.3 to -32.8	-39.5
	411-379	-14.5 to -4.2	-7.8	-11.2 to -1.3	-4.7	-7.7 to 1.8	-1.5	-43.8 to -33.3	-36.9	-40.3 to -30.4	-33.8	-36.8 to -27.4	-30.6
	363-343	-10.4 to -1.6	-4.3	-6.1 to -1.6	-4.3	-6.1 to 1.5	-1.0	-35.9 to -27.1	-29.8	-31.6 to 24.1	-26.5	-27.4 to 20.7	-23.2
Waikanae	342-324	-11.5 to -5.5	-8.7	-6.1 to 4.1	-1.8	-1.8 to 14.0	5.1	-36.1 to -29.9	-33.1	-30.5 to -20.0	-26.2	-26.1 to -10.4	-19.4
	314-311	-29.5 to -19.6	-25.0	-23.6 to -9.3	-17.1	-17.6 to 0.9	-9.1	-48.1 to -38.4	-43.5	-42.1 to -27.7	-35.6	-35.9 to -17.3	-27.6
	310-305	-39.4 to -35.1	-37.6	-34.5 to -29.8	-32.6	-29.5 to -24.2	-27.5	-58.4 to -54.1	-56.6	-53.6 to -48.7	-51.6	-48.6 to -43.3	-46.6
	304-302	-38.6 to -32.7	-35.6	-33.7 to -28.4	-31.1	-28.7 to -24.2	-26.4	-52.3 to -46.4	-49.4	-47.5 to -41.1	-44.7	-42.4 to -37.9	-40.1
Paraparaumu	301-294	-31.5 to 47.2	3.1	-27.2 to 52.1	8.0	-22.9 to 57.0	12.9	-50.6 to 28.2	-15.9	-46.2 to 33.1	-11.0	-42.0 to 38.2	-6.2
	293-284	31.3 to 52.0	42.2	37.7 to 57.3	47.7	44.3 to 62.8	53.2	12.8 to 33.3	23.6	19.3- 38.8	29.2	25.8 to 44.3	34.8
	283-275	18.3 to 29.3	23.3	24.1 to 36.1	29.7	29.6 to 42.9	36.2	0.5 to 11.3	5.3	6.1 to 18.4	11.8	11.8 to 25.2	18.3
	269-254	-15.3 to 8.3	-4.7	-9.4 to 13.3	0.1	-3.5 to 18.4	5.0	-38.4 to -15.0	-27.8	-32.5 to -9.9	-23.0	-26.5 to -4.9	-18.1
	253-241	-35.5 to -33.7	-34.5	-32.0 to -30.1	-31.0	-28.5 to -26.3	-27.4	-77.5 to -75.6	-76.6	-74.2 to -72.1	-73.1	-70.6 to -68.4	-69.4
Raumati	240-220	-43.5 to -33.5	-40.2	-40.1 to -29.5	-36.8	-36.7 to -25.2	-33.1	-84 to -73.6	-80.6	-79.4 to -68.5	-75.9	-73.8 to -62.4	-70.2

				0.3m RSL	R 2070			0.7m RSLR 2070						
		P10		P33	P33 P66			P10		P33		P66		
Coastal Cell	Transect Group	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	
	213-193	-61.7 to -52.6	-58.2	-57.9 to -49.2	-54.6	-54.1 to -45.7	-50.9	-112.8 to -103.7	-109.3	-105.9 to -97.0	-102.4	-99.2 to -90.6	-95.9	
	192-174	-62.8 to -57.5	-59.5	-59.1 to -54.0	-55.9	-55.2 to -50.4	-55.2	-109.3 to -104.1	-106.1	-103.8 to -98.6	-100.5	-97.6 to -92.6	-94.5	
	173-169	-53.6 to -53.5	-53.5	-50.2 to -50.0	-50.2	-46.7 to -46.5	-46.6	-92.1 to -92.0	-92.1	-87.3 to -87.1	-87.2	-82.1 to -81.9	-82.0	
	168-163	-49.4 to -48.9	-49.2	-45.6 to -45.3	-45.5	-41.6 to -41.3	-41.5	-83.3 to -83.2	-83.2	-77 to -76.8	-76.9	-68.6 to -68.2	-68.4	
	162-153	-59.3 to -57.3	-57.9	-54.8 to -53.0	-53.6	-49.9 to -48.0	-48.6	-103.4 to -101.4	-102.0	-95.6 to -93.5	-94.2	-84.4 to -82.0	-82.9	
Queen	152-132	-91.8 to -52.4	-66.3	-85.5 to -47.9	-60.6	-78.6 to -42.9	-54.6	-145.7 to 107.7	-120.7	-136.1 to -99.3	-111.6	-122.8 to -86.3	-98.5	
Elizabeth Park	122-89	-50.7 to -44.5	-47.6	-47.1 to -41.3	-44.2	-42.7 to -37.5	-40.1	-106.6 to -100.8	-103.7	-99.0 to -93.5	-96.3	-86.1 to -80.6	-83.4	
	82	-7.4 to -7.4	-7.4	-5.5 to -5.5	-5.5	-3.6 to -3.6	-3.6	-36.7 to -36.7	-36.7	-34.1 to -34.1	-34.1	-31.5 to -31.5	-31.5	
	81-77	-16.8 to -16.8	-16.8	-15.8 to -15.8	-15.8	-14.8 to -14.8	-14.8	-31.4 to -31.4	-31.4	-30.1 to -30.1	-30.1	-28.8 to -28.8	-28.8	
	76-59	-18.3 to -16.7	-17.0	-17.2 to -15.8	-16.0	-16.1 to -14.8	-15.0	-32.9 to -31.4	-31.7	-31.5 to -30.0	-30.3	-30.1 to -28.7	-29.0	
	58-49	-20.8 to -20.7	-20.7	-19.7 to -19.6	-19.7	-18.6 to -18.5	-18.6	-32.2 to -32.2	-32.2	-30.9 to -30.8	-30.8	-29.5 to -29.5	-29.5	
	48-44	-30.9 to -30.8	-30.9	-29.4 to -29.4	-29.4	-28.0 to -28.0	-28.0	-51.9 to -51.8	-51.9	-49.7 to -49.5	-49.6	-47.5 to -47.4	-47.5	
Paekakariki	43-39	-27.0 to -27.0	-27.0	-25.8 to -25.7	-25.7	-24.4 to -24.4	-24.4	-44.4 to -44.4	-44.4	-42.5 to -42.5	-42.5	-40.7 to -40.7	-40.7	
	38-32	-38.4 to -35.9	-37.0	-36.0 to -33.8	-34.8	-33.7 to -31.7	-32.5	-51.0 to -48.6	-49.6	-48.4 to -46.2	-47.1	-45.7 to -43.7	-44.6	
	31-25	-43.1 to -33.2	-37.0	-40.1 to -31.2	-34.7	-37.1 to -29.1	-32.3	-57.0 to -47.4	-51.1	-53.8 to -45.0	-48.4	-50.5 to -42.6	-45.7	
	24-15	-29.0 to -26.5	-26.8	-27.7 to -25.4	-25.7	-26.3 to -24.3	-24.5	-52.1 to -49.7	-50.0	-50.6 to -48.3	-48.6	-48.9 to -46.9	-47.2	
	14-0	-9.3 to -9.2	-9.2	-8.3 to -8.3	-8.3	-7.4 to -7.3	-7.4	-9.3 to -9.2	-9.3	-8.3 to -8.3	-8.3	-7.4 to -7.3	-7.4	

#### Table J.3: Raw Coastal Erosion Distances 2120 (Lower RSLR Scenarios)

				0.60m RSL	R 2120			0.85m RSLR 2120						
		P10		P33		P66		P10		P33		P66		
Coastal Cell	Transect Group	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	
Ōtaki	764-713	3.2 to 108.3	31.3	15.0 to 195.9	51.9	26.1 to 284.3	72.3	-17.4 to 83.8	10.6	-5.5 to 173.9	31.2	5.3 to 260.3	51.7	
	682-665	-29.8 to 20.0	-13.9	-24.7 to 29.4	-6.9	-19.4 to 39.0	0.3	-50.5 to -1.1	-34.6	-45.2 to 8.6	-27.5	-40.1 to 18.6	-20.2	
	664-638	-30.8 to 41.0	-4.3	-25.9 to 65.7	5.9	-20.9 to 97.5	16.2	-51.6 to 20.6	-26.1	-46.7 to 45.1	-16.8	-41.5 to 74.3	-7.3	
Te Horo	636-626	-68.6 to 136.8	-3.7	19.0 to 352.3	141.6	70.7 to 583.7	287.0	-80.3 to 117.5	-16.1	8.9 to 336.4	129.4	58.9 to 579.9	274.1	
	625-611	-256.5 to 26.1	-41.0	-125.8 to 47.7	2.7	-50.2 to 210.9	45.6	-266.0 to 14.1	-52.7	-144.1 to 36.3	-9.3	-61.3 to 204.8	34.2	
	610-571	-16.4 to 12.0	-4.2	-11.9 to 23.6	3.1	-7.0 to 36.1	10.6	-33.0 to -3.7	-20.3	-27.3 to 8.5	-12.3	-21.5 to 21.3	-4.0	
	570-557	-19.5 to 28.0	-3.9	-14.8 to 39.7	2.3	-9.5 to 51.6	8.7	-39.9 to -10.1	-32.4	-34.6 to 1.7	-25.7	-29.3 to 13.7	-18.8	
Peka Peka	537-469	-3.2 to 73.2	19.2	1.1 to 104.9	31.4	5.6 to 152.0	43.6	-21.3 to 55.0	1.0	-17.1 to 86.1	13.2	-12.6 to 132.4	25.4	
	455-412	-24.1 to -1.4	-12.9	-18.5 to 5.5	-7.3	-12.9 to 12.2	-1.4	-44.4 to -21.8	-33.3	-39.0 to -15.1	-27.7	-33.3 to -8.2	-21.8	
	411-379	-15.0 to 5.9	-1.4	-8.7 to 11.1	4.1	-2.4 to 16.4	9.7	-33.2 to -12.3	-19.6	-27.0 to -7.4	-14.1	-20.7 to -1.9	-8.5	
Waikanae	363-343	-12.4 to 5.1	0.0	-4.0 to 11.2	6.4	4.5 to 17.6	12.9	-28.2 to -10.5	-15.9	-19.8 to -4.4	-9.5	-11.7 to 1.8	-3.1	
	342-324	-13.2 to -2.4	-8.3	-3.6 to 17.3	5.2	5.1 to 37.1	18.9	-29.6 to -18.0	-23.9	-18.7 to 2.1	-10.0	-10.3 to 21.3	3.8	
	314-311	-53.1 to -33.0	-43.7	-41.3 to -12.5	-28.0	-29.2 to 7.9	-12.3	-62.8 to -42.4	-53.4	-50.9 to -21.8	-37.5	-38.9 to -1.8	-21.8	
	310-305	-70.0 to -61.3	-66.3	-60.2 to -50.7	-56.4	-50.5 to -40.2	-46.5	-76.4 to -67.7	-72.5	-66.5 to 57.1	-62.8	-56.8 to -46.4	-52.8	
	304-302	-70.9 to -58.9	-64.7	-60.8 to -50.3	-55.5	-51.0 to -41.8	-46.5	-74.5 to -62.9	-68.6	-64.7 to -54.4	-59.4	-54.9 to 46.0	-50.3	
Paraparaumu	301-294	-55.5 to 102.1	13.8	-47.1 to 111.9	23.4	-38.4 to 121.7	33.1	-67.5 to 90.0	1.9	-58.8 to 99.7	11.5	-50.3 to 109.7	21.2	
	293-284	70.1 to 111.8	92.0	83.3 to 122.3	103.0	95.8 to 132.5	113.9	58.4 to 99.9	80.3	71.1 to 110.8	91.4	84.2 to 121.3	102.3	
	283-275	44.5 to 66.5	54.1	55.6 to 80.3	67.0	66.7 to 93.1	79.7	33.7 to 55.4	43.0	44.8 to 68.7	55.8	56.2 to 82.4	68.8	
	269-254	-23.2 to 23.9	-1.9	-11.4 to 34.0	7.7	0.3 to 43.8	17.3	-37.9 to 9.8	-16.3	-26.1 to 19.6	-6.8	-14.2 to 29.4	2.7	
	253-241	-54.3 to -50.7	-52.5	-48.9 to -44.7	-46.6	-43.2 to -38.2	-40.5	-81.2 to -77.8	-79.3	-75.8 to -71.6	-73.5	-70.0 to -65.1	-67.4	
Raumati	240-220	-69.3 to -48.2	-62.5	-65.0 to -41.3	-57.5	-59.9 to -33.9	-51.9	-95.4 to -73.7	-88.5	-90.1 to -65.9	-82.6	-83.5 to -57.3	-75.5	
	213-193	-111.7 to -91.1	-103.8	-105.1 to -85.2	-97.5	-98.5 to -79.7	-91.3	-144.7 to -124.0	-136.7	-135.7 to -155.9	-128.1	-127.5 to -108.3	-120.0	
	192-174	-109.9 to -97.4	-102.1	-103.7 to -92.4	-96.6	-97.5 to -86.9	-90.8	-139.7 to -127.4	-132.0	-132.4 to -121.0	-125.2	-124.5 to -133.7	-117.8	

				0.60m RSL	R 2120			0.85m RSLR 2120						
		P10		P33		P66		P10		P33		P66		
Coastal Cell	Transect Group	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	
	173-169	-100.3 to -100.0	-100.1	-94.8 to -94.6	-94.7	-89.1 to -88.8	-88.9	-122.5 to -121.7	-122.0	-111.9 to -111.6	-111.8	-102.2 to -101.9	-102.0	
	168-163	-94.4 to -93.7	-94.0	-87.1 to -86.6	-86.9	-78.4 to -78.0	-78.2	-120.5 to -120.0	-120.3	-111.3 to -110.8	-111.1	-98.7 to -98.3	-98.5	
	162-153	-104.5 to -99.9	-101.3	-96.5 to -92.3	-93.6	-86.6 to-82.3	-83.8	-132.9 to -128.0	-129.6	-122.5 to -118.3	-119.6	-108.4 to -104.2	-105.5	
Queen Elizabeth Park	152-132	-169.5 to -91.2	-118.5	-156.6 to -82.3	-107.4	-143.3 to -72.2	-95.3	-202.0 to -124.7	-151.7	-187.6 to -113.4	-138.4	-170.5 to -99.1	-122.5	
	122-89	-87.0 to -74.5	-80.9	-80.3 to -69.0	-74.7	-71.8 to -61.2	-66.5	-121.5 to -109.7	-115.6	-112.1 to -101.5	-106.9	-97.9 to -87.3	-93.0	
	82	-6.4 to -6.4	-6.4	-2.9 to -2.9	-2.9	0.7 to 0.7	0.7	-28.1 to -28.1	-28.1	-24.3 to -24.3	-24.3	-20.2 to -20.2	-20.2	
	81-77	-39.5 to -39.5	-39.5	-37.9 to -37.8	-37.9	-36.3 to -36.2	-36.2	-54.5 to -54.5	-54.5	-52.2 to -52.2	-52.2	-50.1 to -50.0	-50.1	
	76-59	-45.2 to -39.5	-40.5	-43.1 to -37.8	-38.7	-40.8 to -36.2	-37.0	-60.0 to -54.5	-55.4	-57.4 to -52.2	-53.0	-54.8 to -50.0	-50.8	
	58-49	-43.5 to -43.4	-43.5	-41.4 to -41.3	-41.4	39.3 to -39.1	-39.2	-52.1 to -52.0	-52.1	-48.0 to -47.9	-47.9	-44.2 to -44.0	-44.1	
Destation	48-44	-54.0 to -53.7	-53.9	-51.3 to -51.1	-51.2	-48.5 to -48.4	-48.5	-67.3 to -37.2	-67.2	-64.1 to -64.0	-64.1	-61.0 to -60.9	-61.0	
Paekakariki	43-39	-59.9 to -54.1	-56.5	-55.9 to -50.8	-53.0	-51.9 to -47.6	-49.4	-63.9 to -63.8	-63.9	-60.9 to -60.8	-60.9	-57.9 to -57.8	-57.8	
	38-32	-65.4 to -44.8	-52.7	-60.3 to -42.2	-49.2	-55 to -39.6	-45.6	-67.8 to -62.1	-64.5	-63.9 to -58.8	-60.9	-59.7 to -55.4	-57.2	
	31-25	-65.3 to -44.7	-52.7	-60.3 to -42.2	-49.2	-55.0 to -39.6	-45.6	-73.9 to -53.7	-61.5	-68.8 to -50.8	-57.8	-63.5 to -47.9	-54.1	
	24-15	-54.4 to -48.7	-49.3	-52.2 to -47.0	-47.6	-49.7 to -45.3	-45.8	-69.7 to -63.9	-64.5	-67.3 to -62.2	-62.7	-64.8 to -60.4	-60.9	
	14-0	-31.0 to -30.9	-31.0	-29.8 to -29.8	-29.8	-28.6 to -28.5	-28.6	-39.3 to -39.2	-39.2	-38.0 to -38.0	-38.0	-36.8 to -36.7	-36.7	

#### Table J.4: Raw Coastal Erosion Distance 2120 (Higher RSLR Scenarios)

		1.25m RSLR 2120						1.65m RSLR 2120						
		P10		P33		P66		P10		P33		P66		
		Range (m)	Average (m)	Range (m)	Average (m)									
Ōtaki	764-713	-51.0 to 53.8	-22.3	-38.3 to 140.1	-1.9	-27.5 to 227.6	18.6	-84.2 to 19.6	-55.5	-71.4 to 109.5	-34.8	-60.4 to 198.3	-14.1	
	682-665	-83.6 to -33.7	-67.7	-78.4 to -24.0	-60.5	-73.0 to -14.4	-53.2	-117.1 to -66.9	-100.9	-111.6 to -57.5	-93.6	-106.0 to -47.5	-86.1	
	664-638	-84.7 to -12.5	-57.9	-79.7 to 12.2	-47.6	-74.4 to 44.7	-37.1	-117.9 to 45.3	-91.0	-112.6 to -20.9	-80.5	-107.1 to 11.5	-70.0	
Te Horo	636-626	-101.3 to 104.0	-34.6	-10.5 to 314.5	110.6	40.6 to 558.8	256.4	-121.4 to 77.6	-54.6	-27.4 to 296.3	91.9	22.8 to 535.1	238.1	
	625-611	-287.7 to -7.9	-73.0	-161.6 to 17.4	-28.7	-81.2 to 189.5	16.6	-312.1 to -29.6	-94.0	-181.7 to -1.9	-48.1	-99 to 170.4	-1.4	
	610-571	-60.8 to -29.7	-47.0	-52.9 to -16.4	-37.4	-44.8 to -2.2	-27.3	-88.5 to -56.0	-74.3	-78.1 to 41.3	-62.7	-67.2 to -25.4	-50.4	
	570-557	-73.0 to -25.0	-57.1	-67.1 to -12.9	-50.0	-60.8 to -0.2	-42.6	-106.5 to -57.1	-90.5	-99.6 to -44.5	-82.4	-92.2 to -31.5	-73.9	
Peka Peka	537-469	-50.4 to 25.9	-27.9	-46.2 to 57.6	-15.8	-41.6 to 103.2	-3.5	-79.4 to -3.7	-57.0	-75.1 to 27.9	-44.8	-70.5 to 74.2	-32.5	
	455-412	-77.4 to -54.6	-66.2	-71.7 to -47.8	-60.4	-65.6 to -40.8	-54.5	-109.9 to 87.2	-99.0	-104.3 to -80.3	-93.1	-98.2 to -73.3	-87.0	
	411-379	-62.3 to -41.4	-48.7	-55.9 to -36.2	-43.2	-49.7 to -30.9	-37.6	-91.4 to -70.7	-77.8	-85.3 to -65.5	-72.3	-78.8 to -59.9	-66.7	
Waikanae	363-343	-53.8 to -36.1	-41.4	-45.3 to -29.7	-35.0	-36.7 to -23.5	-28.5	-79.2 to -61.6	-66.8	-70.5 to -55.4	-60.3	-62.3 to -49.1	-53.8	
	342-324	-53.4 to -41.4	-34.5	-42.9 to -22.5	-34.5	-34.4 to -3.2	-20.8	-78.2 to -66.0	-72.5	-67.5 to -46.7	-58.8	-58.7 to -26.9	-44.2	
	314-311	-77.8 to -58.1	-68.7	-66.2 to -37.1	-52.7	-54.2 to 16.6	-37.0	-93.2 to -73.4	-83.9	-81.3 to -52.9	-68.1	-69.4 to -32.3	-52.4	
	310-305	-100.8 to -92.3	-97.4	-91.1 to -81.7	-87.4	-81.5 to -70.8	-77.5	-120.1 to -111.8	-116.5	-110.3 to -101.1	-106.5	-100.4 to -90.2	-96.6	
	304-302	-101.3 to -89.9	-95.4	-91.6 to -81.1	-86.2	-81.8 to -72.9	-77.3	-109.2 to -97.2	-103.2	-99.4 to -89.0	-94.1	-89.2to -80.6	-84.8	
Paraparaumu	301-294	-74.4 to 82.6	-5.4	-65.9 to 92.7	4.4	-57.5 to 102.6	14.0	-105.3 to 51.5	-36.3	-97.0 to 61.5	-26.6	-88.3 to 71.5	-16.9	
	293-284	40.4 to 81.5	61.8	53.1 to 92.2	72.8	66.0 to 103.2	83.9	20.7 to 62.9	43.1	34.3 to 73.7	54.2	47.4 to 84.6	65.6	
	283-275	15.2 to 37.4	25.0	26.4 to 50.9	37.8	37.6 to 63.8	50.6	-3 to 19.8	6.9	8.3 to 33.2	19.9	19.8 to 46.2	32.7	
	269-254	-60.8 to -13.6	-39.5	-49.0 to -3.9	-29.9	-37.4 to 6.4	-20.3	-83.8 to -36.5	-62.6	-72.1 to -26.8	-53.0	-60.1 to -16.9	-43.4	
	253-241	-108.6 to -104.8	-106.5	-103.0 to -98.6	-100.7	-97.2 to -92.1	-94.5	-172.6 to -169.1	-170.7	-167.1 to 162.7	-164.8	-161.3 to -156.3	-158.6	
Raumati	240-220	-122.0 to -100.1	-114.9	-115.8 to -91.4	-108.0	-107.9 to -81.6	-99.2	-185.0 to -162.2	-177.7	-176.3 to -151.7	-168.5	-163.1 to -137.8	-155.2	
	213-193	-178.0 to -157.8	-170.1	-166.8 to -146.7	-159.1	-156.2 to -136.9	-148.8	-257.8 to -237.1	-249.7	-240.0 to -220.4	-232.6	-224.1 to -204.8	-216.8	
	192-174	170.1 to -158.2	-162.6	-161.5 to -150.0	-154.3	-151.7 to -141.0	-144.9	-242.9 to -230.9	-235.3	-230.0 to -218.7	-222.9	-215.6 to -204.8	-208.9	
	173-169	-162.7 to -162.3	-162.4	-154.3 to -154.0	-154.2	-145.0 to -144.7	-144.9	-225.3 to -224.7	-225.0	-213.5 to 213.1	-213.2	-200.2 to -199.6	-199.9	
	168-163	-153.1 to -152.4	-152.7	-41.0 to -140.2	-140.7	123.8 to -122.7	-123.3	-210.0 to -209.3	-209.6	-192.6 to -192.1	-192.3	-166.9 to -165.8	-166.1	
			1.25m RSLR 2		1.65m RSLR 2120									
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		P10		P33		P66		P10		P33		P66		
		Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	Range (m)	Average (m)	
	162-153	-161.7 to -157.1	-158.5	-148.9 to -144.7	-146.0	-130.7 to -125.9	-127.5	-229.7 to -225.5	-226.9	-211.3 to -206.8	-208.2	-182.0 to -177.3	-179.2	
Queen Elizabeth Park	152-132	-240.5 to -164.0	-190.3	-222.9 to -149.7	-174.0	-200.6 to -127.8	-152.0	-312.2 to -236.2	-262.4	-289.4 to -216.7	-241.0	255.5 to -183.8	-207.2	
	122-89	-161.3 to -149.9	-155.6	-148.7 to -137.6	-143.2	-128.0 to -116.4	-121.8	-234.9 to -223.4	-229.1	-216.5 to -205.1	-210.4	-181.8 to -170.9	-176.8	
Paekākāriki	82	-53.9 to -53.9	-53.9	-49.3 to -49.3	-49.3	-44.8 to -44.8	-44.8	-84.1 to -84.1	-84.1	-78.1-78.1	-78.1	-72.4 to -72.4	-72.4	
	81-77	-76.3 to 76.1	-76.2	-72.9 to -72.8	-76.2	-69.9 to -69.8	-69.9	-108.9 to -103.5	-104.5	-104.1 to -98.8	-99.8	-99.7 to-94.6	-95.5	
	76-59	-81.5 to -76.2	-77.2	-78.0 to -72.9	-73.8	-74.7 to -69.8	-70.7	-108.9 to -103.5	-104.5	-104.1 to -98.8	-99.8	-99.7 to -94.6	-95.5	
	58-49	-72.1 to -71.9	-72.0	-68.7 to -68.6	-68.7	-65.6 to -65.5	-65.6	-93.8 to -93.4	-93.6	-89.2 to -89.0	-89.1	-85.0 to -84.8	-84.9	
	48-44	-80.9 to -80.8	-80.8	-77.1 to -77.0	-77.1	-73.5 to -73.3	-73.4	-113.5 to -113.2	-113.4	-107.9 to -107.8	-107.9	-102.9 to -102.8	-102.8	
	43-39	-79.1 to 78.9	-78.9	-75.3 to -75.2	-75.3	-71.7 to -71.7	-71.7	-107.0 to -106.9	-107.0	-101.9 to -101.8	-101.8	-97.1 to -97.0	-97.0	
	38-32	-76.0 to -70.4	-72.8	-71.8 to -66.8	-69.0	-67.5 to -63.0	-65.0	-96.0 to -90.3	-92.7	-90.9 to -85.9	-88.0	-85.7 to -81.3	-83.1	
	31-25	-88.1 to -67.9	-75.7	-82.5 to -64.7	-71.6	-76.7 to -61.2	-67.3	-102.2 to -82.7	-90.2	-96.4 to -78.7	-85.5	-90.2 to -74.5	-80.6	
	24-15	-84.6 to -78.9	-79.5	-82.0 to -77.0	-77.5	-79.3 to -75.0	-75.5	-120.8 to -115.4	-116.0	-117.9 to 112.8	-113.4	-114.8 to -110.3	-110.8	
	14-0	-60.8 to -60.8	-60.8	-59.5 to -59.4	-59.4	-58.0 to -57.9	-58.0	-74.3 to -74.1	-74.2	-72.7 to -72.6	-72.6	-71.1 to -71.0	-71.0	

## Appendix K. Beach profile lowering graphs

### **Raumati Profiles**











## Paekākāriki Profiles











# Appendix L. Erosion vulnerability (Land Parcels)

	Cell	Ōtaki		Te Horo		Peka Peka		Waikanae		Paraparaumu		Raumati		Queen Elizabeth Park		Paekākāriki	
RSLR Scenario	Public/Private	P10	P33	P10	P33	P10	P33	P10	P33	P10	P33	P10	P33	P10	P33	P10	P33
0.2m RSLR 2050	Private	3	2	4	3	7	6	10	6	13	13	276	269	0	0	45	44
	Public	0	0	0	0	2	2	1	1	0	0	7	7	4	4	3	3
0.4m RSLR 2050	Private	4	4	4	4	10	10	28	11	25	20	333	329	0	0	45	45
	Public	0	0	0	0	4	4	3	2	0	0	7	7	4	4	3	3
0.3m RSLR 2070	Private	3	2	3	3	3	2	8	3	29	21	318	308	0	0	90	83
	Public	0	0	0	0	2	2	1	1	0	0	7	7	4	4	3	3
0.7m RSLR 2070	Private	10	10	8	7	61	57	59	41	57	54	436	429	0	0	148	148
	Public	0	0	0	0	8	8	3	3	1	0	8	8	4	4	3	3
0.6m RSLR 2120	Private	1	1	3	3	2	1	7	4	58	49	412	406	0	0	150	149
	Public	0	0	0	0	2	2	1	0	0	0	8	8	4	4	3	3
0.85m RSLR 2120	Private	7	4	4	4	18	17	30	9	71	62	579	559	0	0	158	158
	Public	0	0	0	0	6	5	3	1	0	0	8	8	4	4	3	2
1.25m RSLR 2120	Private	38	30	11	11	83	73	68	54	97	83	725	691	0	0	201	193
	Public	2	2	0	0	9	9	4	3	1	1	9	9	4	4	3	3
1.65m RSLR 2120	Private	95	92	42	40	127	125	110	104	130	119	1,000	939	0	0	258	245
	Public	3	3	0	0	10	10	4	4	1	1	18	17	5	5	3	3

Table L.1 Summary of Private/Public Land Parcels potentially susceptible to coastal erosion up to P10.

Table L.2: Number of public/private land parcels potentially effected by erosion in hydrosystems.

			RSLR Scenarios									
Coll	Land parcels	Probability	2050		20	070	2120					
			0.2m	0.4m	0.3m	0.7m	0.6m	0.85m	1.25m	1.65m		
Ōtaki Biyar Hydrosystam Call	Public	Total Area	NA	1	1 <sup>(1)</sup>	1 <sup>(2)</sup>	1 <sup>(2)</sup>	1	1	3		
Otaki kiver nydrosystem cett	Private	Total Area	NA	1	1 <sup>(1)</sup>	1 <sup>(2)</sup>	1 <sup>(2)</sup>	1	1	1		
Mangaone Stream Hydrosystem	Public	Total Area		0	0		0					
Private Total Area 16 16   Waikanae River Hydrosystem Public Total Area NA 3 <sup>(1)</sup> 2 <sup>(1)</sup>		16	16									
Waikanae River Hydrosystem	Public	Total Area	NA	3 <sup>(1)</sup>	2 <sup>(1)</sup>	2 <sup>(2)</sup>	3 <sup>(2)</sup>	3	3	4		
Cell	Private	Total Area	NA	3 <sup>(1)</sup>	4 <sup>(1)</sup>	4 <sup>(2)</sup>	4 <sup>(2)</sup>	9	10	30		
Wharemauku Stream	Public	Total Area	1	1	1	1	1	1	1	2		
Hydrosystem Cell	Private	Total Area	8	9	8	16	13	17	22	29		
Whareroa Stream Hydrosystem	Public	Total Area	1	1	1	1	1	1	1	2		
Cell	Private	Total Area	0	0	0	0	0	0	0	0		
Te Kowhai Stream Hydrosystem	Public	Total Area		2	2	3	2	2	3	3		
Cell	Private	Total Area	1		1	3	1	1	5	6		
Waimeha Stream Hydrosystem	Public	Total Area		0		0	0	0	0	0		
Cell	Private	Total Area	3	30	2	29	30	30	32	35		
Tikotu Stream Hydrosystem Cell	Public	Total Area		2		2	2					
	Private	Total Area		0		0	0					
Wainui Stream Hydrosystem	Public	Total Area	1	1	1	1	1	1	1	1		
Cell	Private	Total Area	1	1	1	1	1	1	1	1		
Waitohu Stream Hydrosystem	Public	Total Area	1		1		1					
Cell	Private	Total Area	-	18	-	18	18					
(1) Calculated from 0.4m SLR bath (2) Calculated from 0.65m SLR bat	ntub model thtub model											



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11 February 2022

Kapiti Coast District Council 175 Rimu Rd Paraparaumu

#### Attention: Lyndsey Craig

Dear Lyndsey

#### Takutai Kāpiti Coastal Hazard Susceptibility and Vulnerability Methodology Review

Kapiti Coast District Council (Council) commissioned Beca on the 13 November 2020 to provide ongoing peer review services for the Takutai Kāpiti Coastal Hazard Susceptibility and Vulnerability Assessment that is being completed by Jacobs New Zealand Limited (Jacobs) for Council.

I confirm that I am a Technical Director in Coastal Science for Beca Ltd with over 20 years' experience in the field of coastal science, coastal hazards, climate change and metocean engineering. I frequently provide coastal hazard peer review services for New Zealand Councils. Review services for the Takutai Kāpiti Coastal Hazard Susceptibility and Vulnerability Assessment have been completed on the following:

- Jacobs assessment, methodology and data gap memorandum.
- Jacobs draft report: Kāpiti Coast Coastal Hazard Susceptibility and Vulnerability Assessment Volume 1: Methodology (dated 12 May 2021).
- Jacobs draft report: Kāpiti Coast Coastal Hazard Susceptibility and Vulnerability Assessment Volume 2: Results (dated 10 June 2021 and January 2022) that presents a summarised methodology and assessment results.

I can confirm that during the project I have provided intermittent review and feedback which has been integrated into the project approach and methodology with the last comments provided 11 February 2022 (Review #5).

Based on my review, I can confirm that the coastal erosion hazard methodology as outlined in the aforementioned reports:

- Is consistent with the assessment guideline intent outlined in MfE, 2017: *Coastal Hazards and Climate Change Guidance for Local Government.*
- Adopts current assessment techniques that have been used to define coastal hazards for similar environs in New Zealand;
- Considers uncertainty of the individual parameters contributing to coastal erosion from future sea level rise; and
- Is considered appropriate considering the level of information and data available and is suitable to inform the development of potential adaptation options.

It is noted that the inundation hazard methodology has adopted a simplified inundation technique to inform the assessment with the intent of being superseded by more detailed assessments that are being completed by others. Nevertheless, the inundation assessment is considered suitable for informing adaptation options.

Yours sincerely

Connon Andrews Technical Director – Coastal Science on behalf of Beca Limited Email: Connon.Andrews@beca.com



16 February 2022

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Kāpiti Coast District Council 175 Rimu Road Private Bag 60601 Paraparaumu 5254

Tēnā Koe Lyndsey,

### Kāpiti Coastal Hazard Susceptibility and Vulnerability Assessment

Kāpiti Coast District Council requested technical support from Greater Wellington Regional Council in October 2020 to provide peer review and feedback into the Takutai Kāpiti coastal hazard exposure and vulnerability assessment being undertaken by Jacobs New Zealand Limited.

To date this has involved reviewing the methodology for the assessment contained in the first volume report, a review of the results contained in the second volume and finally, a re-review of both reports following further feedback and edits.

I am the Senior Regional Hazards Analyst and policy advisor for the Wellington Regional Council. I have been employed at the Council since 2006. I hold a PhD specialising in coastal processes and geomorphology and have been involved in coastal research for over 25 years, at university level, within consultancy and currently in local government.

As the natural hazards for analyst Wellington Regional Council I provide scientific analysis, commentary and research into natural and coastal hazards that affect the Greater Wellington region and to write and/or provide expert advice and evidence for hearings, the Environment Court and policy that deals with managing the risks from natural hazards. I provide advice to policy analysts, resource managers, consents officers, engineers and elected councillors in the region, and to business's and the wider public.

Through the review of this work I provided feedback from the inception of the project and into the development of the methodology through to a peer review of the final written documents.

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It is based on a reanalysis of existing data and information, of which a significant body of knowledge has accumulated for the Kapiti Coast over the past 30-40 years, and updated with the latest understandings of climate change and sea level rise published by the Intergovernmental Panel on Climate Change (IPCC). It is consistent with New Zealand guidance for coastal hazard assessments and acknowledges the uncertainty in the data and future projections focussing objectively on the numerical statistics without introducing additional subjective levels of uncertainty.

The second volume of this work applied the methodology from the first volume to calculate credible future changes in shoreline position and geomorphic coastal response as it adjusts to an ongoing rise in sea level.

A review and edit of both volumes has been undertaken in response to feedback, resulting in a number of refinements, principally, the inclusion of two additional future sea level rise scenarios. The changes add a further refinement to the report that will support adaptive coastal planning and decision making. Whilst these changes provide clarity and further useful information, they have not materially altered the original methodology or findings and the first reviews of this work remain valid.

I am satisfied that the methodology to undertake the coastal vulnerability assessment and the results from this work are appropriate for the purposes of informing and guiding community based decision making for coastal adaptation in the short, medium and long term planning horizons and to provide direction for District Plan coastal hazard management approaches.

Nāku noa, nā

Jan Dame

**Dr lain Dawe** Senior Hazards Analyst Environmental Policy

DD: 04 830 4031 lain.dawe@gw.govt.nz