



Update on Northland Natural Hazards Programme

Toby Kay – Natural Hazards Advisor
29 October 2015

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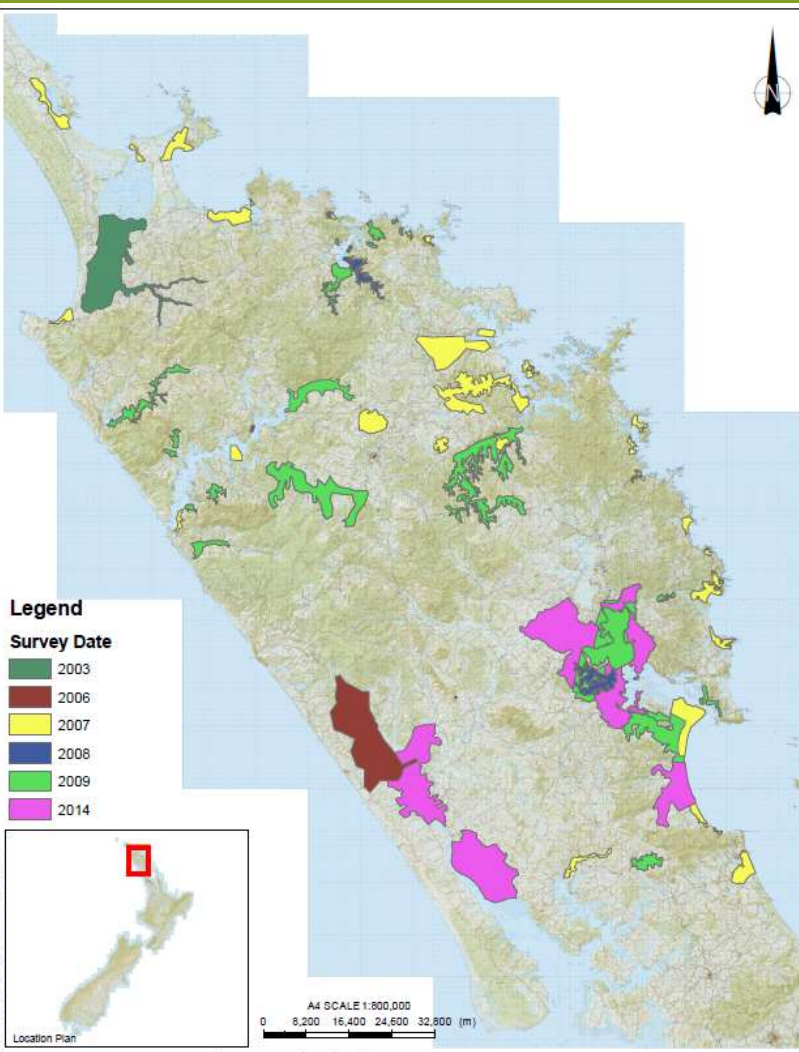
NRC Natural Hazards Management Work Programme

- HAZARD IDENTIFICATION
 - River flood mapping
 - coastal flooding
 - coastal erosion
- RISK REDUCTION
 - RPS policies re: subdivision, development and land use in hazard areas
 - River Management Plans
 - Flood Schemes



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Use of LIDAR in Hazard Mapping



Objective:

Regional
LIDAR
survey for
Northland

~ \$1.5M –
\$1.7M



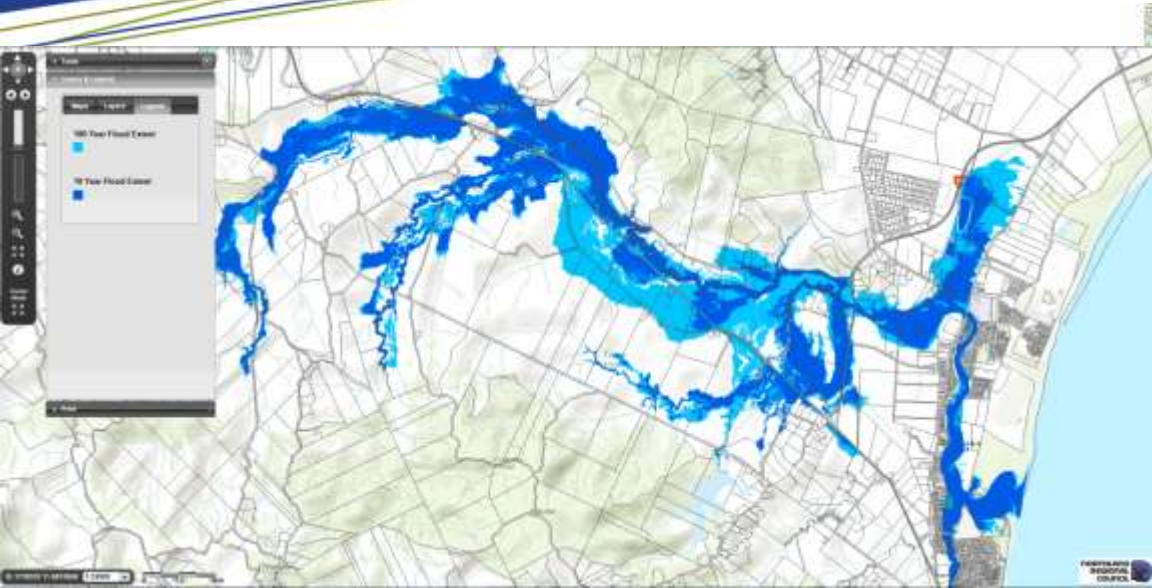
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Hazard Assessment Approach

- River flood hazard assessed by hydraulic modelling & based on LiDAR & HIRDS v3 data. Tidal boundary condition incorporates SLR at 0.5m.
→ Event Based 10%, 2%, 1%, 1% AEP CC
- Coastal flood hazard assessed by determining storm surge, wave runup/overtopping & SLR, & based on LiDAR
→ CFHZ 0 = 1% AEP current
CFHZ 1 = 2% AEP (2065)
CFHZ 2 = 1% AEP (2115)
- Coastal erosion hazard assessed by determining trends in shoreline position, beach response to SLR & other factors
→ Long term change over defined time lines 50 and 100 years

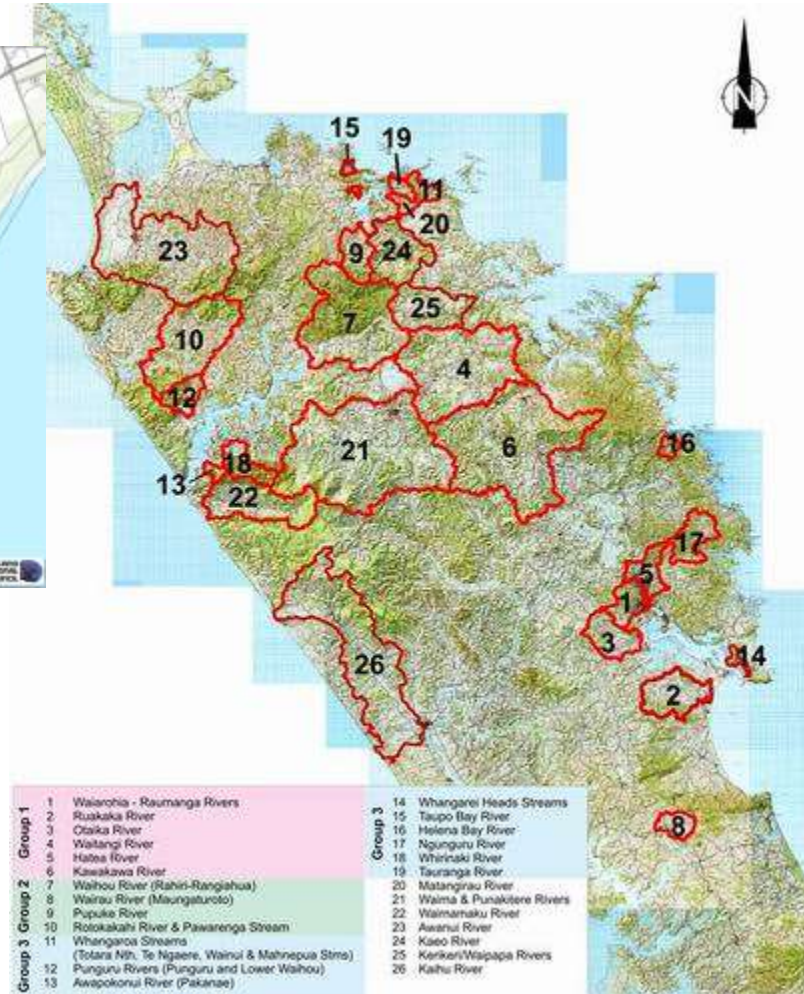
Priority Rivers Flood Maps

www.nrc.govt.nz/Your-Council/Council-Projects/Priority-Rivers/Flood-maps/

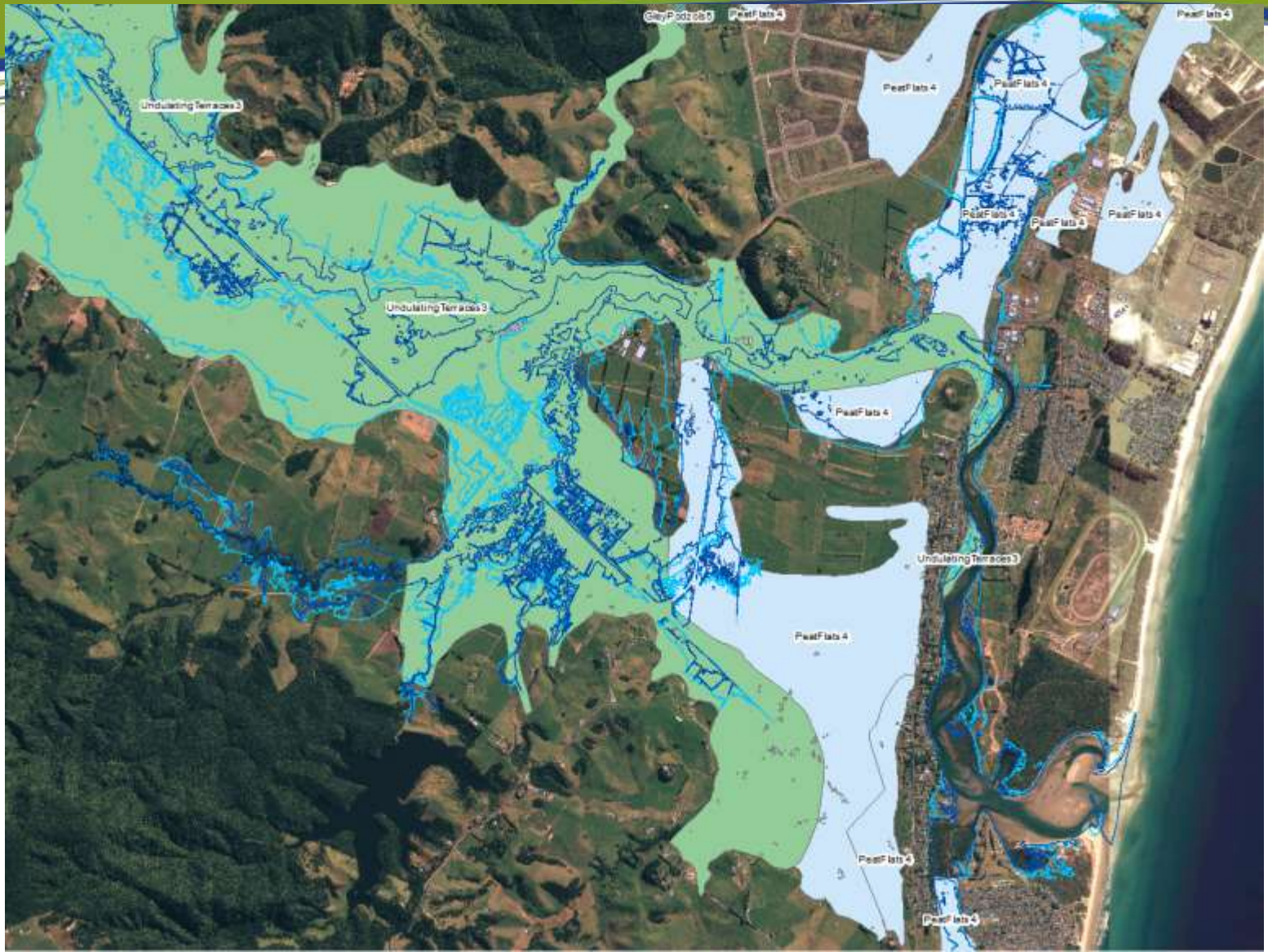


2016: New models to be developed for Waipu & Paparoa

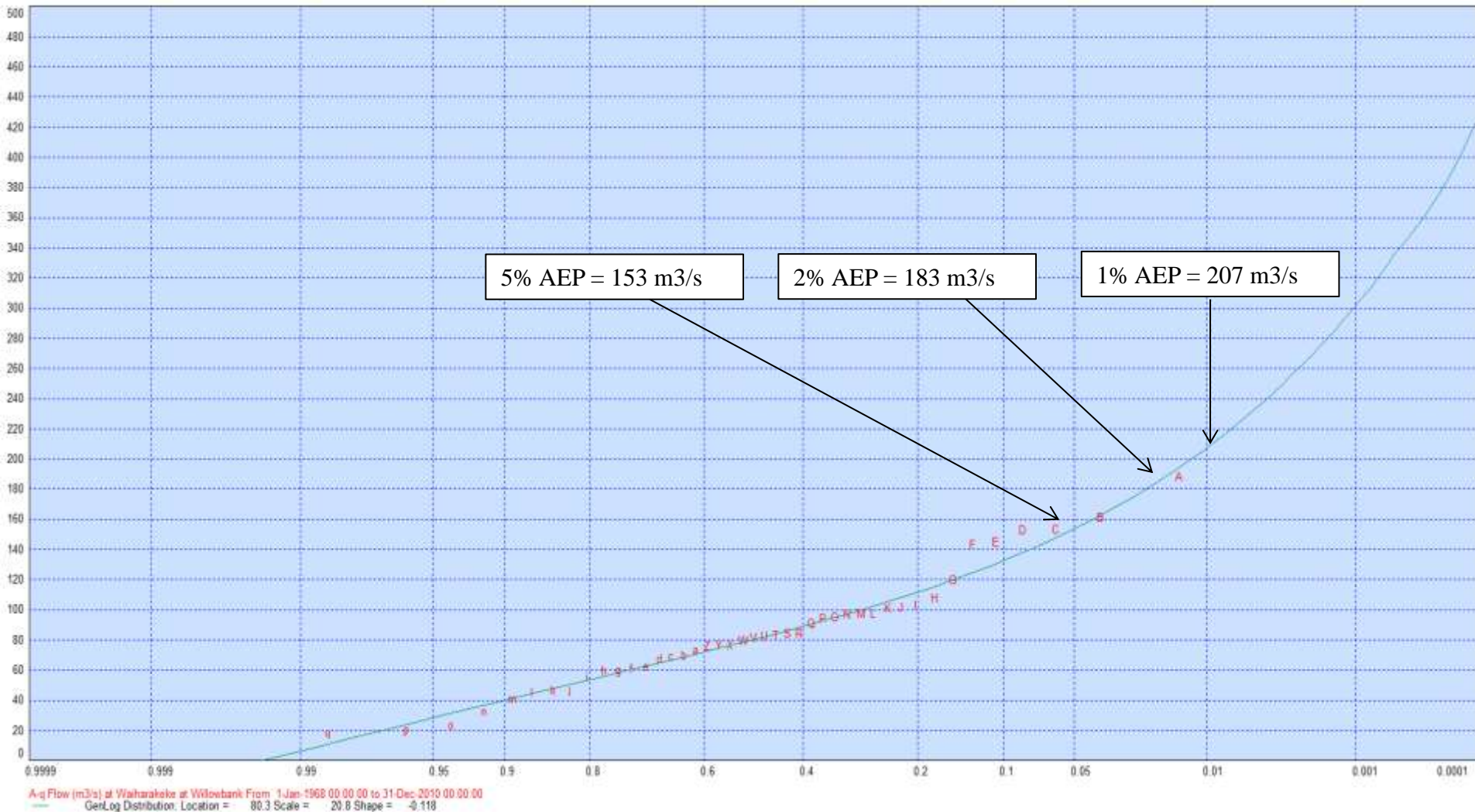
Post Regional LIDAR survey: Northland wide Flood Model?



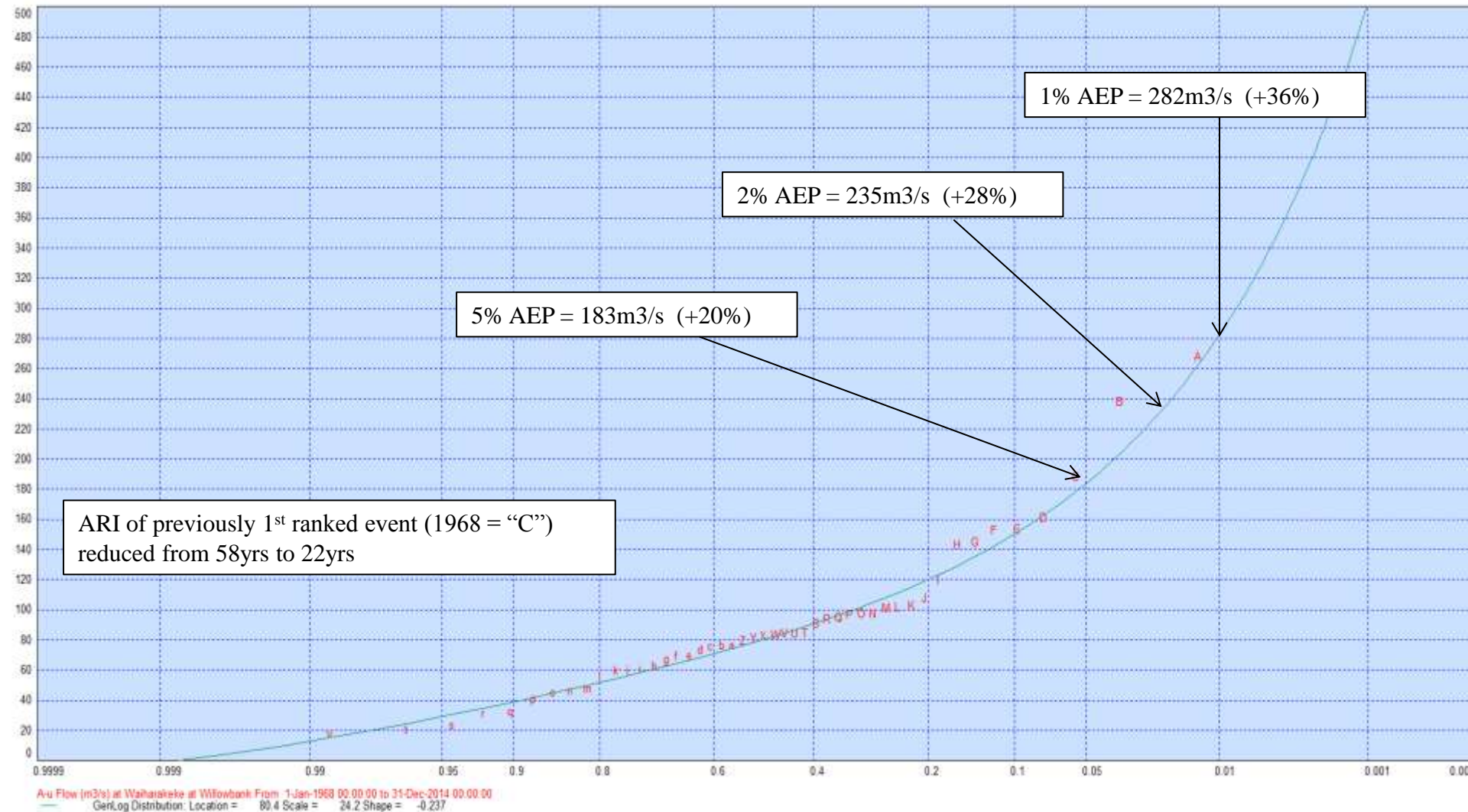
Priority Rivers vs Flood Susceptibility Mapping (Soil Based)



Shifting probabilities in Flood Analysis Moerewa (Willowbank) 1968 - 2010

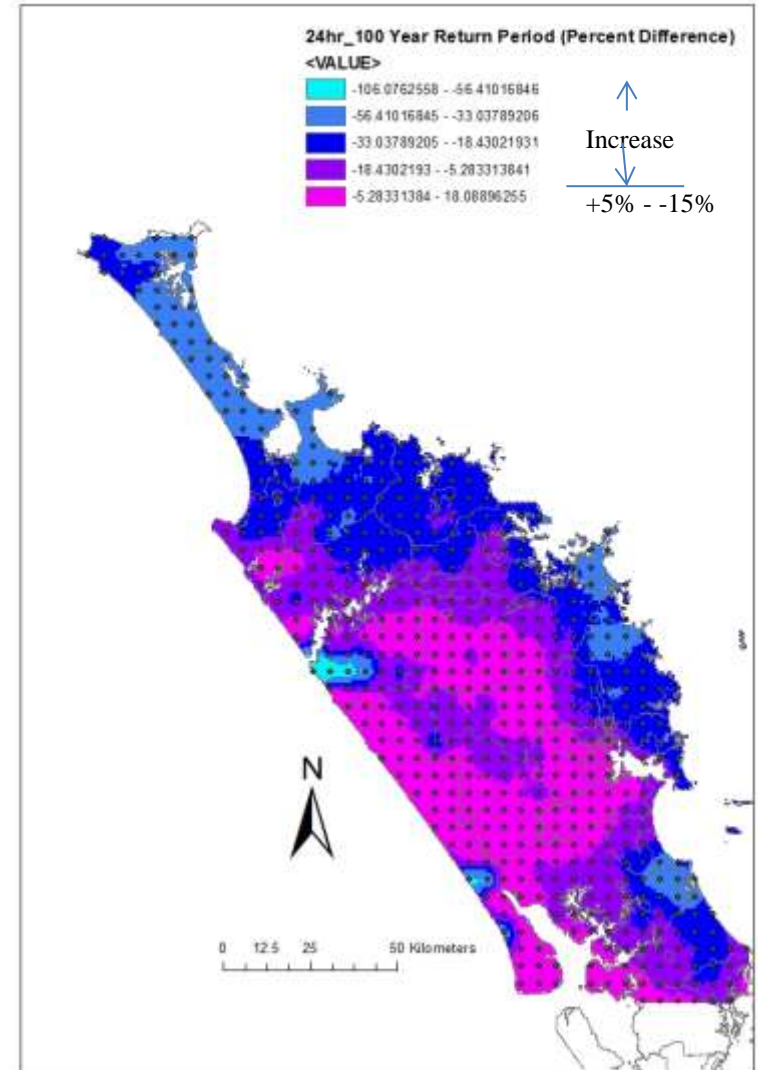
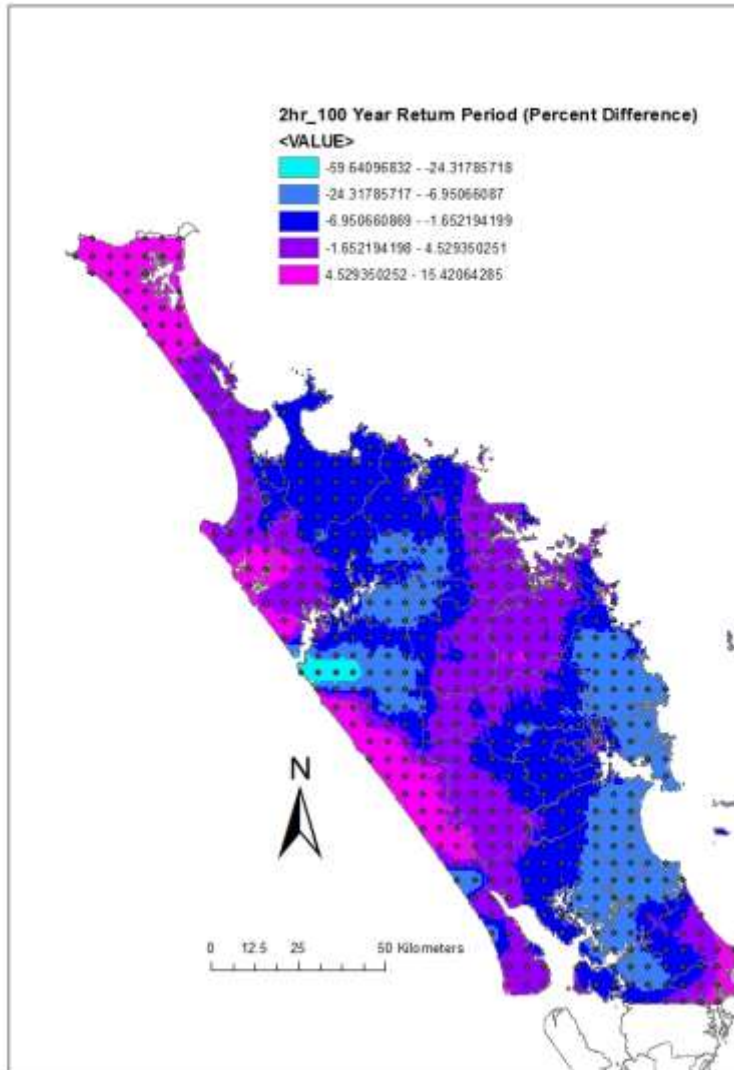


Shifting probabilities in Flood Analysis Moerewa (Willowbank) 1968 - 2014



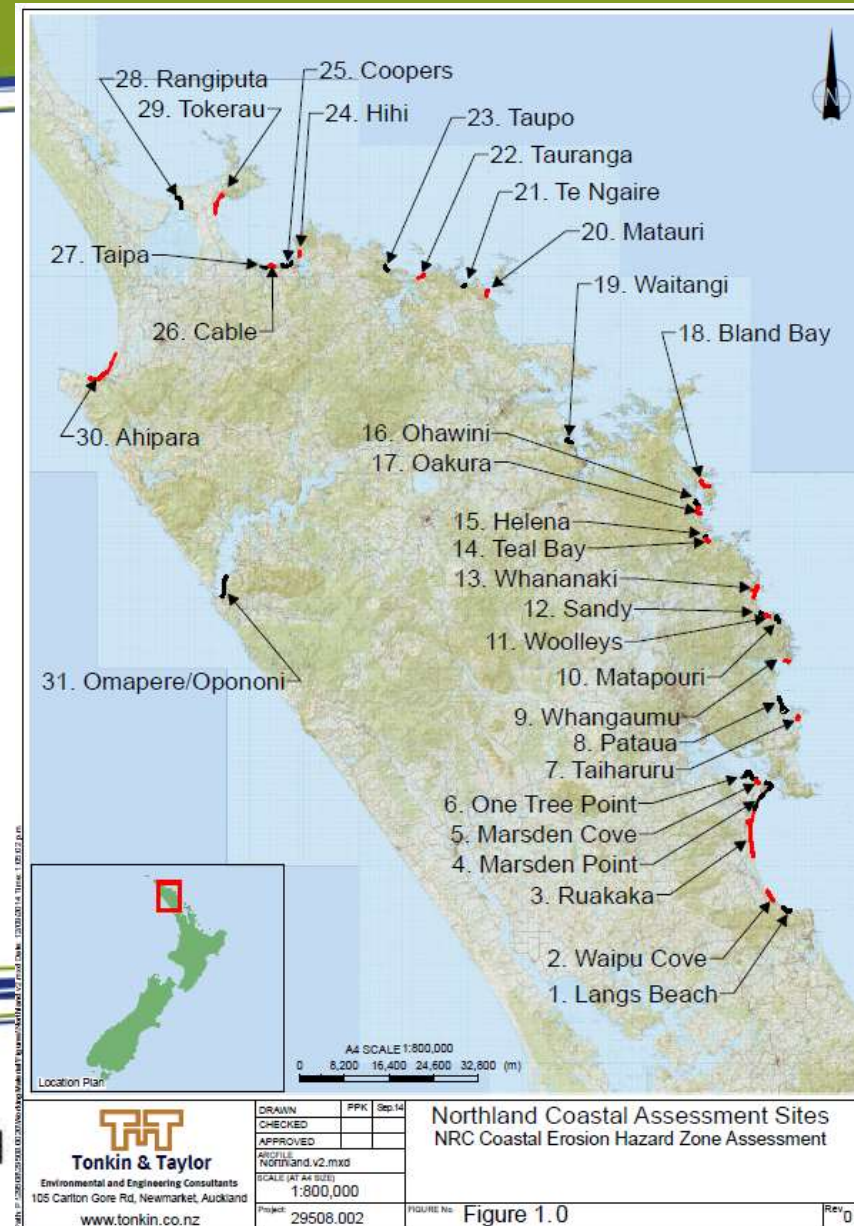
Shifting Probabilities in Storm Rainfall

HIRDS v2 vs HIRDS v3 % shift (Draft)



Coastal Erosion Hazard Zone Assessments

- Scope of assessment
 - New set of Coastal Erosion Hazard Zones for 31 sites around Northland
 - Updated methodology and data. Higher SLR Projections
 - CEHZ 1 = 2065 (66% likelihood)
 - CEHZ 2 = 2115 (5% likelihood)



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Schematic of Coastal Erosion Assessment

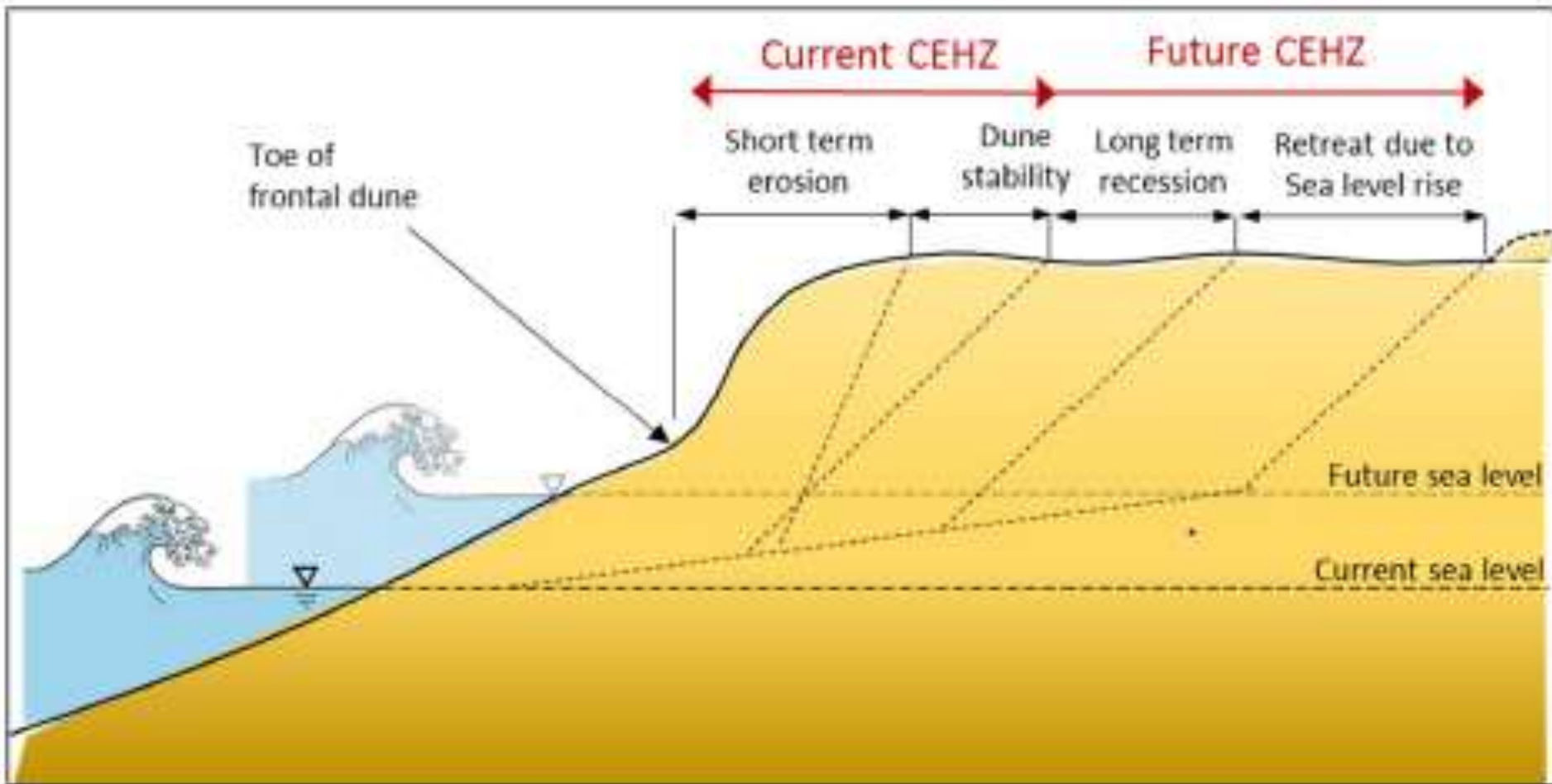


Figure 4-2 Definition sketch for open coast CEHZ

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Coastal Erosion Hazard Zones



Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography.

A4 SCALE 1:10,000
0 100 200 300 400 500 (m)

Tonkin & Taylor
Environmental and Engineering Consultants

www.tonkin.co.nz

DRAWN	PPK	Aug.14
CHECKED		
APPROVED		
ARCFILE 1400804_SitePlan.mxd		
SCALE (AT A4 SIZE) 1:10,000		
PROJECT No.	29508.002	

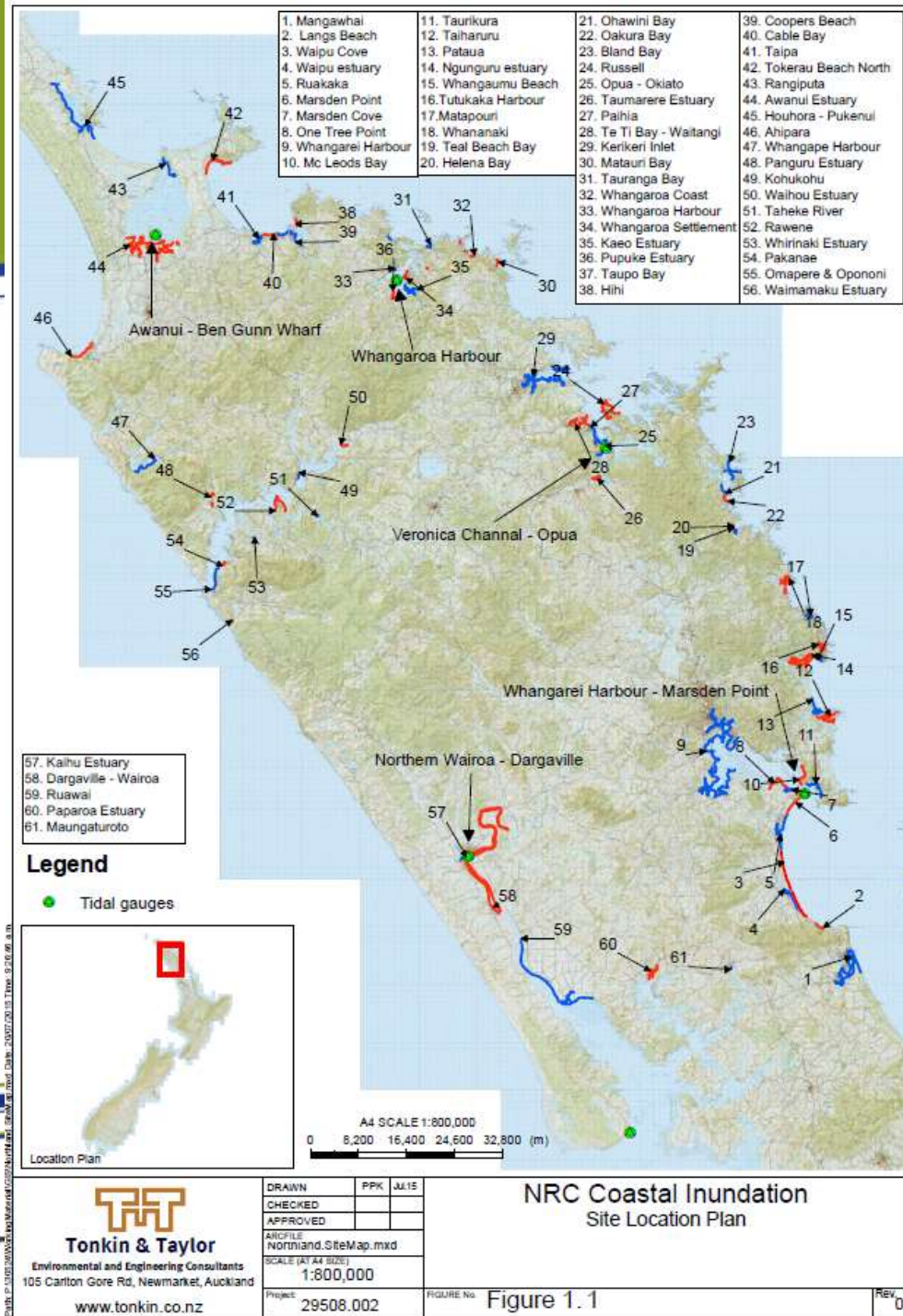
NORTHLAND REGIONAL COUNCIL
CEHZ Assessment
Waipu Cove
Site: 2

FIGURE No. **Figure 2**

Rev. 0

Coastal Flood Hazard Zones

- 61 sites (LIDAR coverage)
- Tidal gauge analysis
- Wave model to assess setup/runup
- Existing 1% AEP and 2% AEP levels determined.
- SLR estimates adopted
 - Zone 1 (2065) @ 0.4m
 - Zone 2 (2115) @ 1.0m
- Extents mapped for run up and storm surge
- Guideline developed for site-specific assessment of floor levels in run up zones



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Schematic of Coastal Flood Assessment

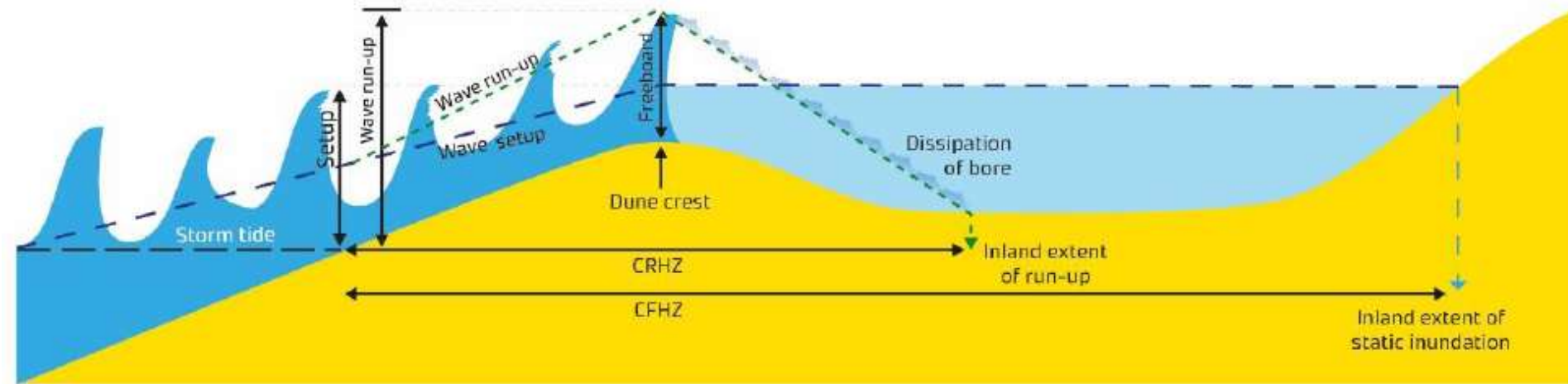


Figure 4-1 Definition sketch for CFHZ and CRHZ

Legend

Whangarei2014_DTM

* 2 Tolerance: 1.500

Edge type

— Soft Edge

— Hard Edge

Elevation

2.4 - 3.1

2.1 - 2.4

-0.53 - 2.1

Whangarei Draft CFHZ
Present day 1% AEP Storm Surge (Blue) = 2.1m OTP
Zone 1 (Red - 2065) 2% AEP = 2.4m OTP
Zone 2 (Yellow - 2115) 1% AEP = 3.1m OTP
Scale 1:5,000

0 125 250 500 Meters



Dargaville Draft CFHZ
Present day 1% AEP Storm Surge (Blue) = 3.0m OTP
Zone 1 (Red - 2065) 2% AEP = 3.4m OTP
Zone 2 (Yellow - 2115) 1% AEP = 4.0m OTP
Scale 1:10,000

Dargaville stopbank design
crest level is 3.26m OTP
(Above current 1% AEP
but below zone 1 and zone
2 flood elevations)

Legend

Kaihu_DTM

* Z Tolerance: 0.000

Edge type

— Soft Edge
— Hard Edge

Elevation

3.4 - 4
3 - 3.4
-0.53 - 3

0 250 500 1,000 Meters

Risk Reduction – Scheme Works



Figure 4: Part of the now completed Kaepo Flood Scheme Stage 1

Kotuku Flood Detention Dam

NRC Dam1 20 October 2015

12:00:00 pm



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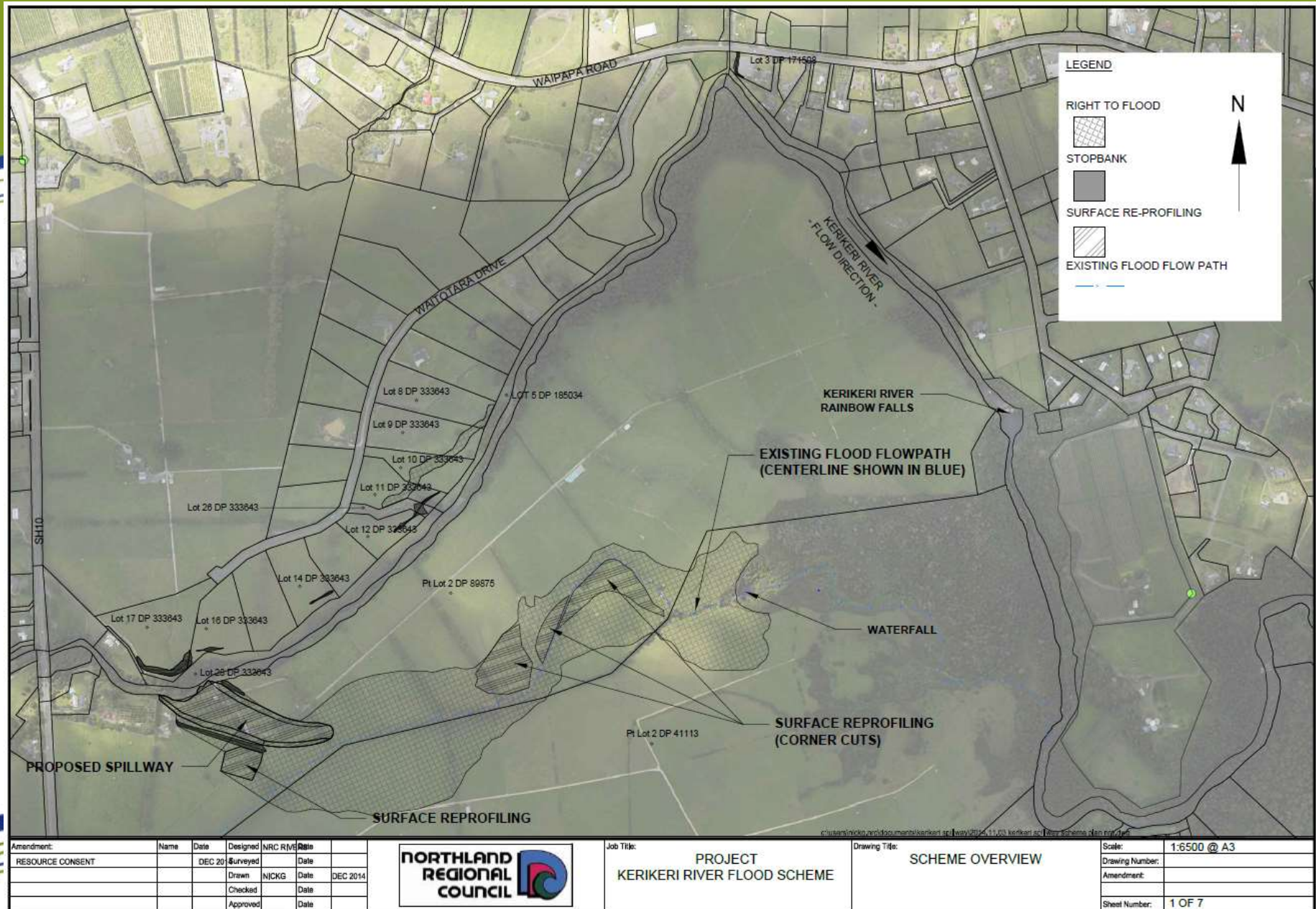
snapihd

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Kerikeri River Flood Scheme



Amendment:	Name	Date	Designed	NRC RVS	Date
RESOURCE CONSENT		DEC 20	Surveyed		Date
			Drawn	NJCKG	Date DEC 2014
			Checked		Date
			Approved		Date



Job Title:
PROJECT
KERIKERI RIVER FLOOD SCHEME

Drawing Title:
SCHEME OVERVIEW

Scale: 1:6500 @ A3
Drawing Number:
Amendment:
Sheet Number: 1 OF 7

Thank you

Toby Kay

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