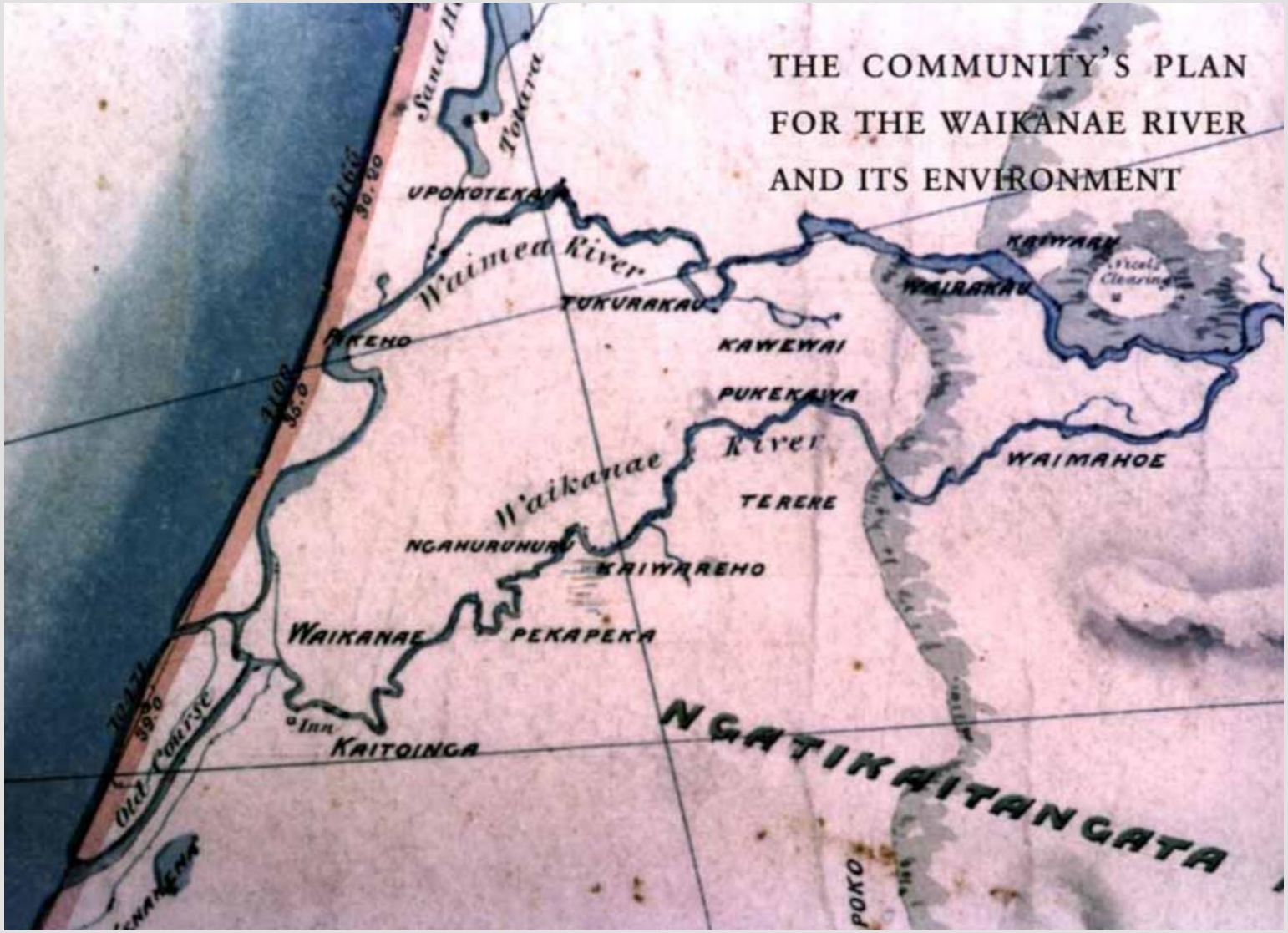
Model Re-build

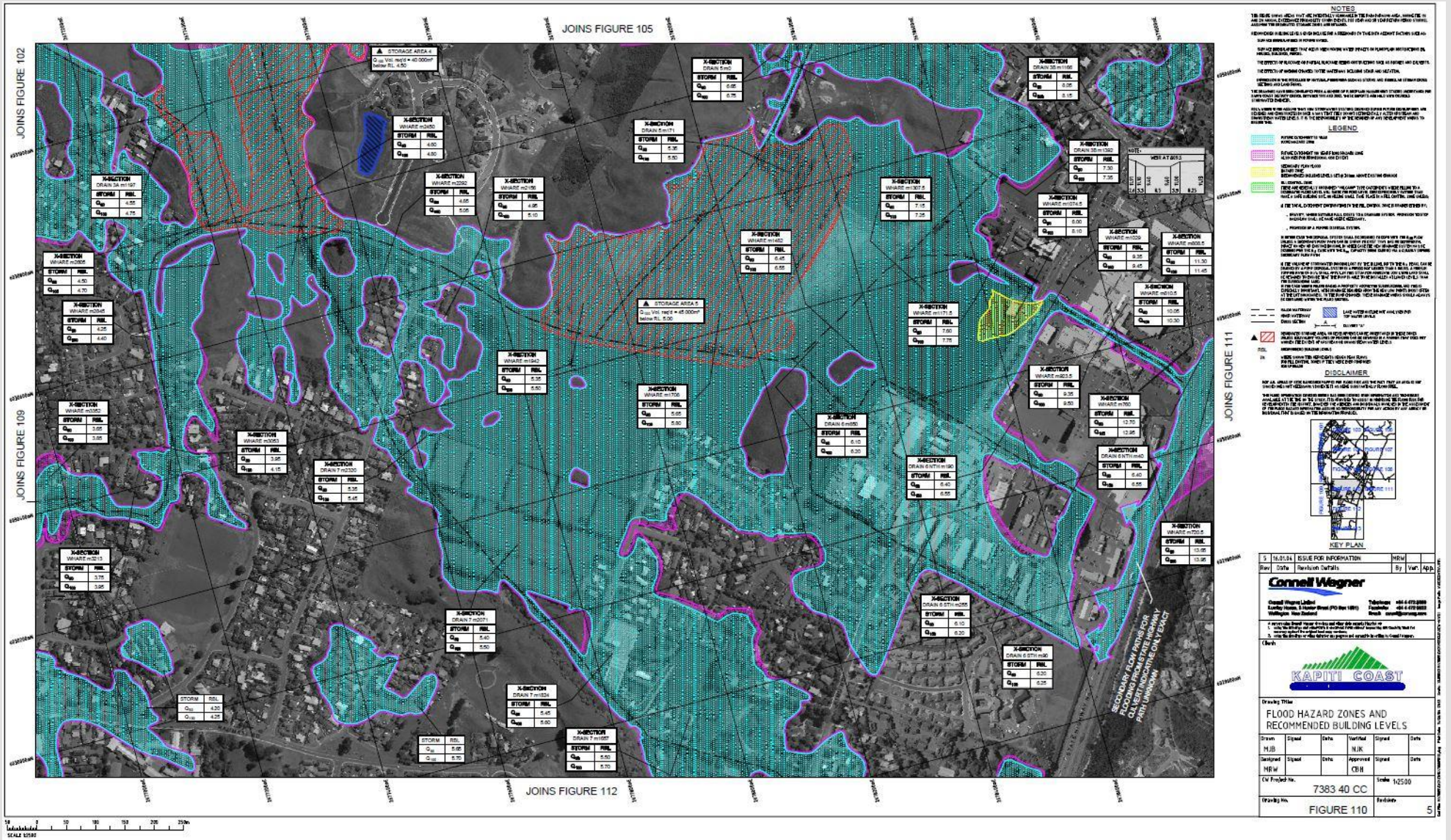
Overview

History - Landform

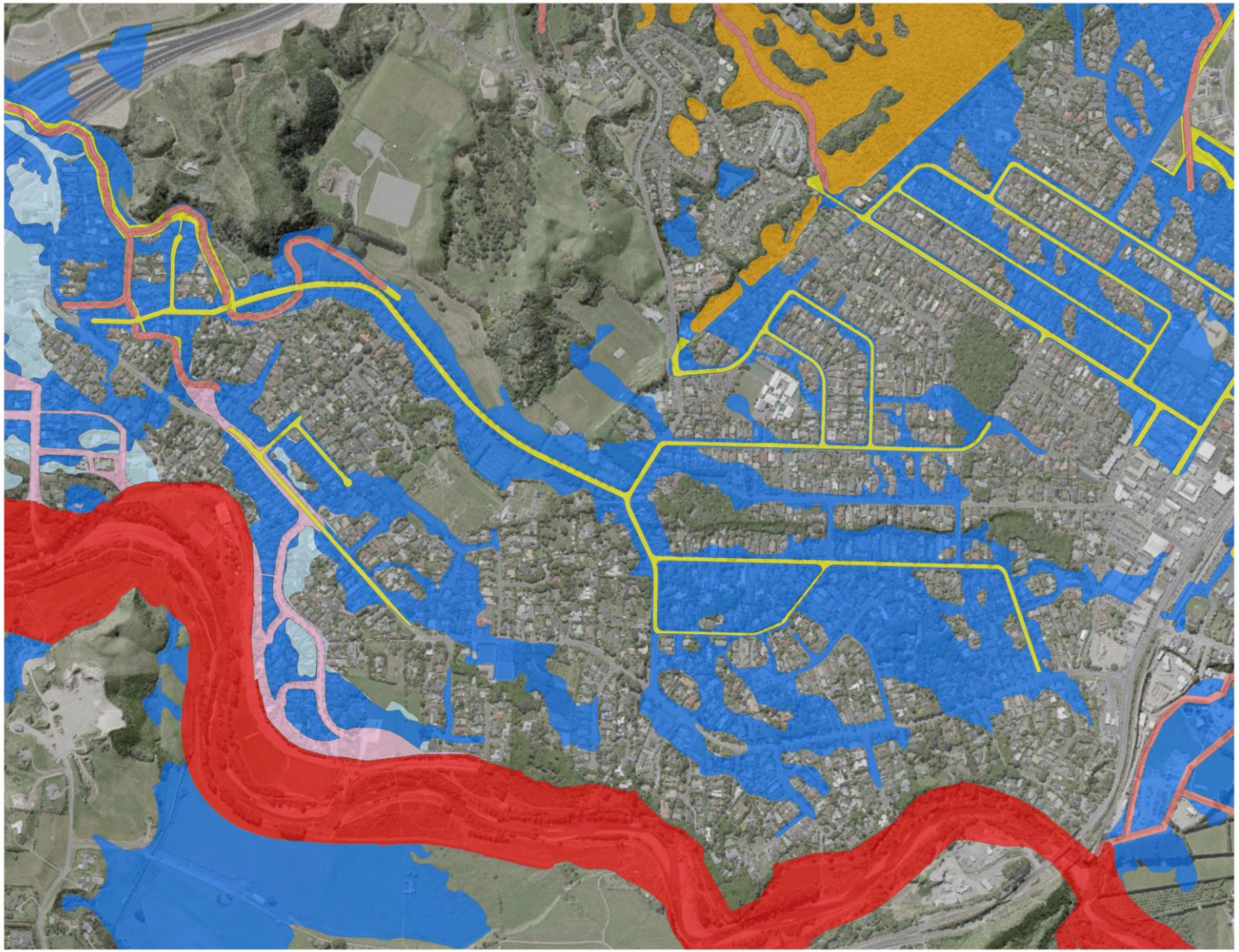


Flood Hazard

- RMA 1992 required Flood Hazards to be identified.
- 1998 Flooding in Kapiti “encouraged” the development of first hydraulic models.
- Flood maps were incorporated into the District Plan through Plan Change 51 including Community Consultation.
- This included bringing together KCDC and GWRC hazard layers.


JOINS FIGURE 105
JOINS FIGURE 102
JOINS FIGURE 109
JOINS FIGURE 111
JOINS FIGURE 112
STORAGE AREA 4
STORAGE AREA 5
SECONDARY FLOW PATHS FOR FLOODING FROM STATE HIGHWAY DO NOT INDICATIVE ONLY EXACT PATH UNKNOWN
NOTES
LEGEND
DISCLAIMER
KEY PLAN
Connell Wagner
KAPITI COAST
FLOOD HAZARD ZONES AND RECOMMENDED BUILDING LEVELS
7383 40 CC
FIGURE 110
5

FLOOD HAZARD MANAGEMENT PLANS



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Date: 14/10/2020

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LEGEND

- River Corridor
- Stream Corridor
- Ponding
- Residual Ponding
- Residual Overflow
- Overflow Path
- Storage
- Fill Control

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Why Update the Models?

- Previous models had no link to Groundwater which has proven to be a significant issue for the District.
- Climate change Updates need to be made including resilience planning.
- The new highways need to be incorporated into the models.
- New Technologies provide additional benefits and uses.
- LiDAR & low lying vegetation have been poorly represented in the past.
- Better planning for future Growth post TG.
- More flexible platform (TuFLOW)

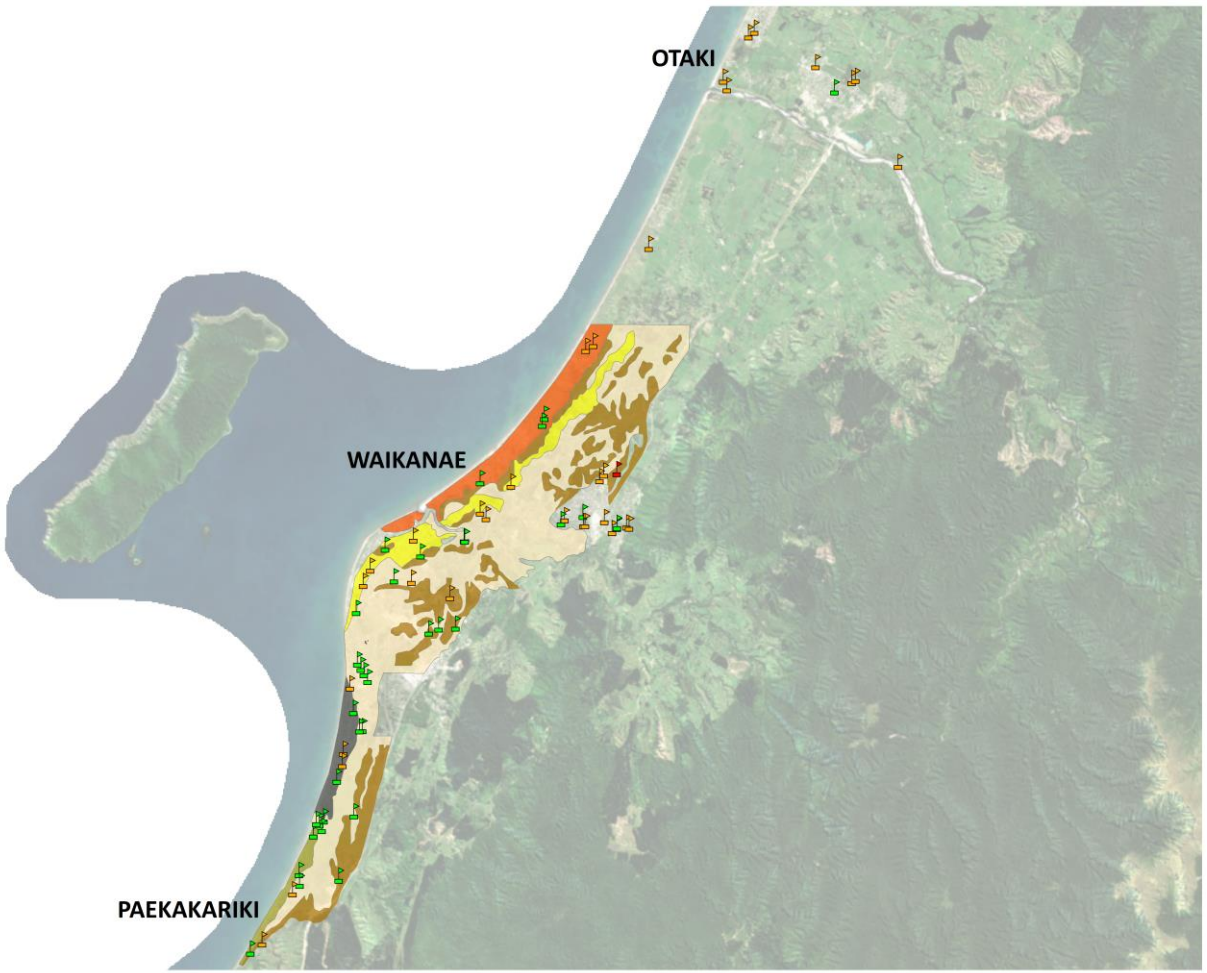
User	Purpose	Requirements/Informs
Civil Defence	• Protect Critical Infrastructure • Plan for emergency events	• Flood Hazard Maps • Modelling and planning for high risk situations (i.e. dambreak, critical infrastructure failure, high risk flooding).
Structure Planning	• Growth Planning • Plan Changes • Whaitua • Development of Strategy Documents • Regional Growth Plan etc.	• Catchment scale overview (ICMP) • Flood Plain Assessment/Mapping • Interaction between 3 waters • Master planning Inputs. • Shared governance with Tangata Whenua. • Climate Change and Adaptive Management Planning • Sensitivity Analysis
Infrastructure planning & design	• LTP • Integrated Catchment Management plans • Flood Damage Analysis • Testing Capital Works Designs • Operations and maintenance	• Asset Management Planning • Renewals Planning • Capacity Assessment • Infrastructure Location/Sizing – Level of service (Risk based Vs LoS Based). • Multi Criteria Analysis – decision making. • Development Contributions • Safety in Design • System Performance Analysis • Holistic, Risk based decision making. • Scenario Testing

User	Purpose	Requirements/Informs
Resource Consent	• Compliance with land development that are associated with/require: • Flood Plains • Overland Flow Paths • Water Quality • Drainage • Assess effects according to relevant plans	• Flood Risk Assessment • Development • Council Infrastructure • Central Gov. Projects • Capacity Assessments • Water Sensitive Design/Catchment Plan Development • Section 106 – Subdivision can be turned down due to Natural Hazards. • Water Quality – Assess the design of water sensitive design solutions. • Streamline Consenting Process.
Building Consent	• Network/drainage infrastructure sizing and design • Designing infrastructure to be owned privately • Development/individual lot scale.	• Network/ Stormwater Management Device Sizing • Capacity Assessment • System Performance Analysis • Avoid Section 72. • Use Section 71? – but very hard to use.
Engineering Approval	• Network/drainage infrastructure sizing and design • Designing infrastructure that will be vested with Council/authority • Analysis of design to be in greater detail than for resource consent/earlier stages	• Network/ Stormwater Management Device Sizing • Capacity Assessment • System Performance Analysis

Model Re-build

- Built in TuFlow
- Rain on Grid
- Incorporates Groundwater
- Much more detailed
- Revised Climate Change Assumptions

SOIL TYPES



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Date: 21/01/2022

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TestingLocations
SiteID
- 0
- 1
- 2

DepositTypes
Type
- F - Foxton
- OW - Old Waitarere
- Y - Young Waitarere
- P - Peat
- T - Taupo
- WM - Waitarere-Motuiti

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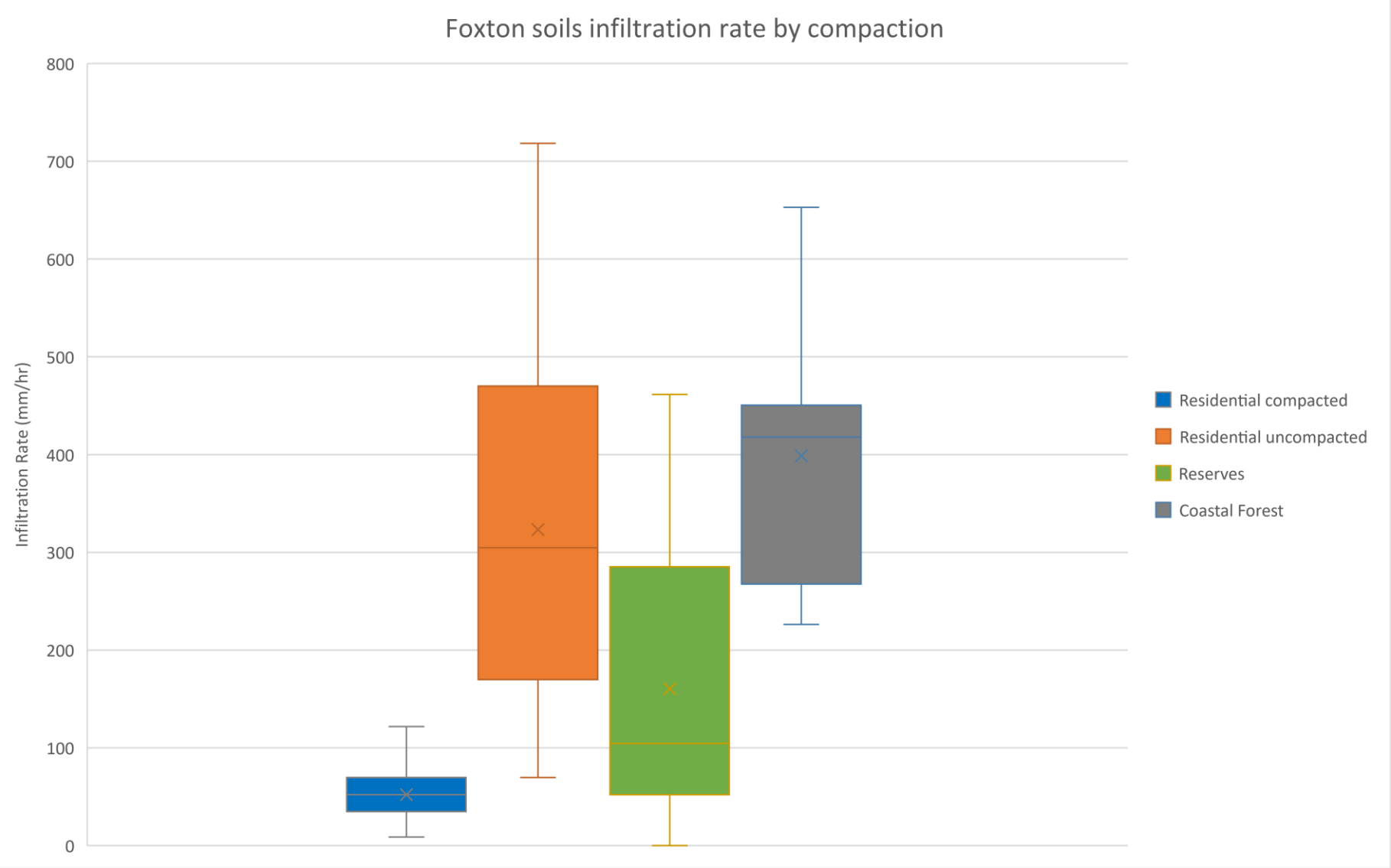
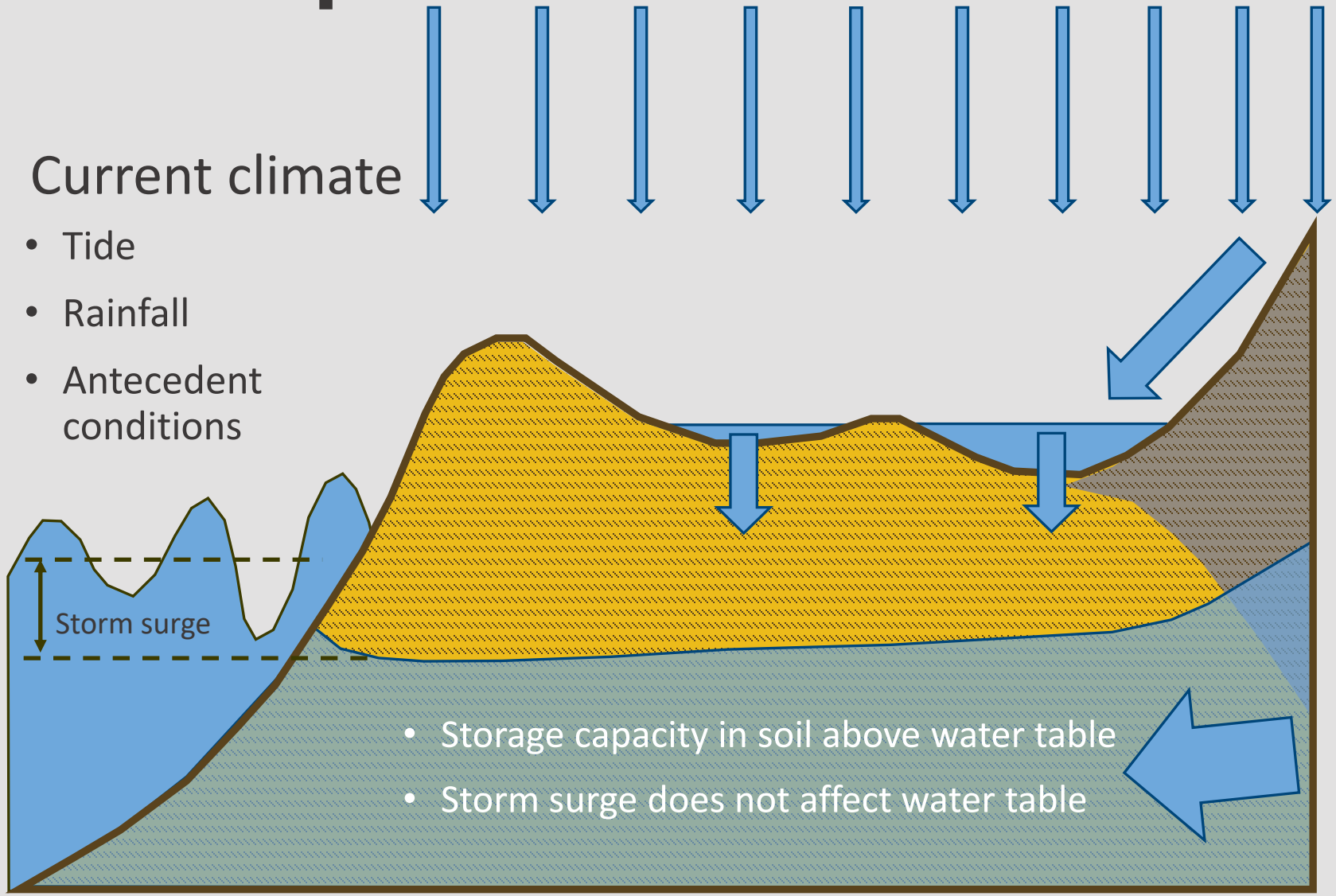
Focussing on Foxton Soils…



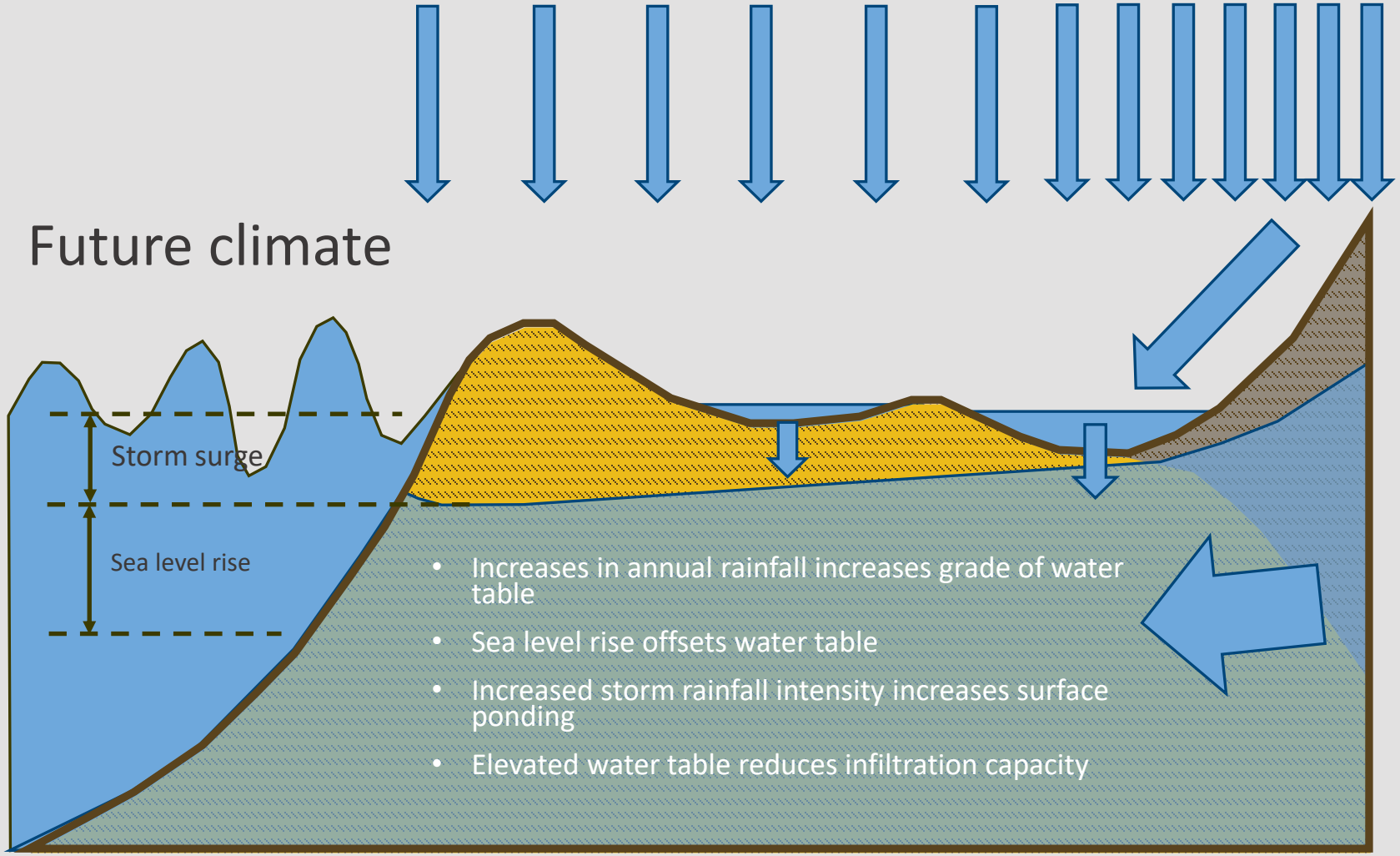
Conceptual model

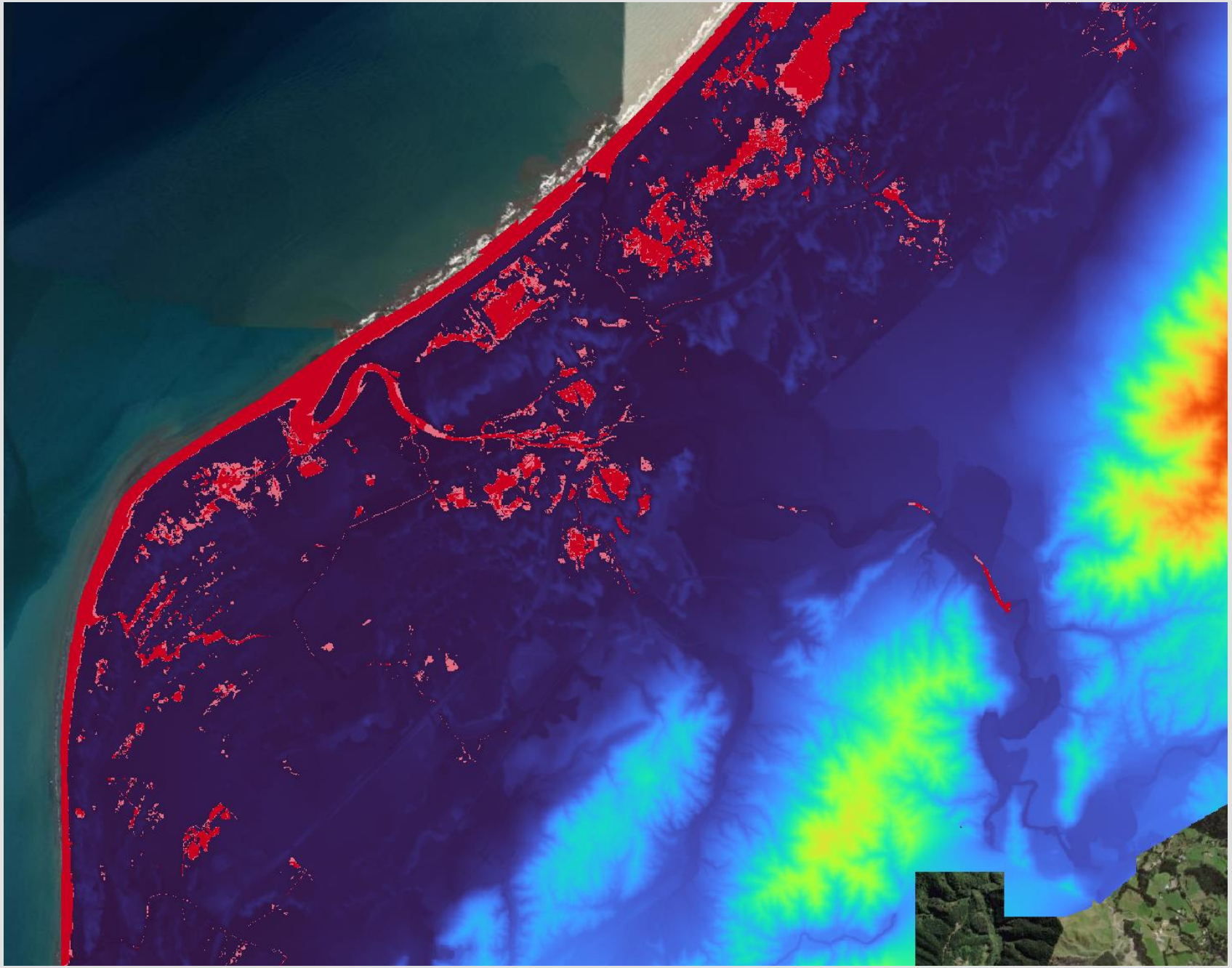
Current climate

- Tide
- Rainfall
- Antecedent conditions



Conceptual model





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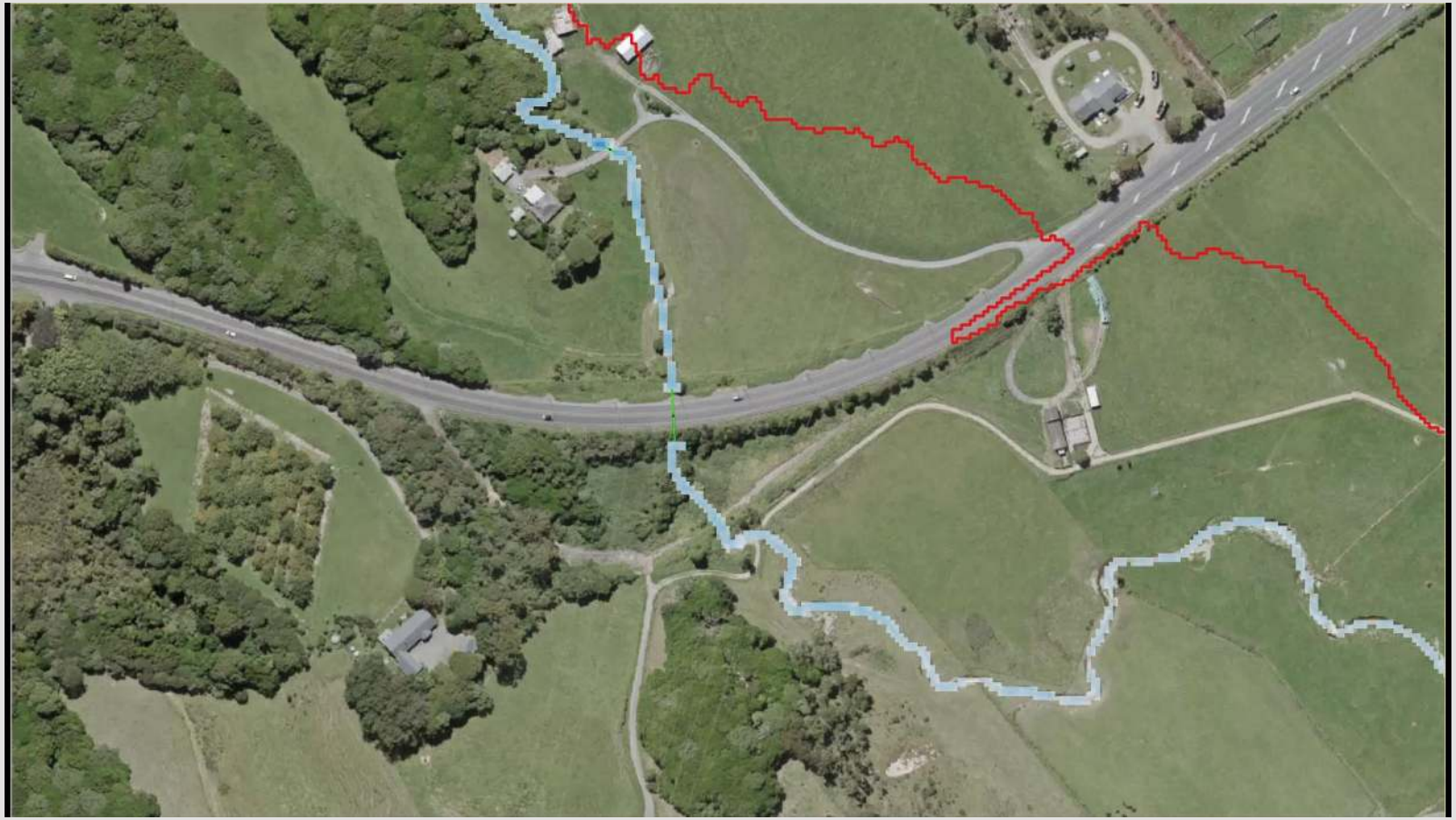
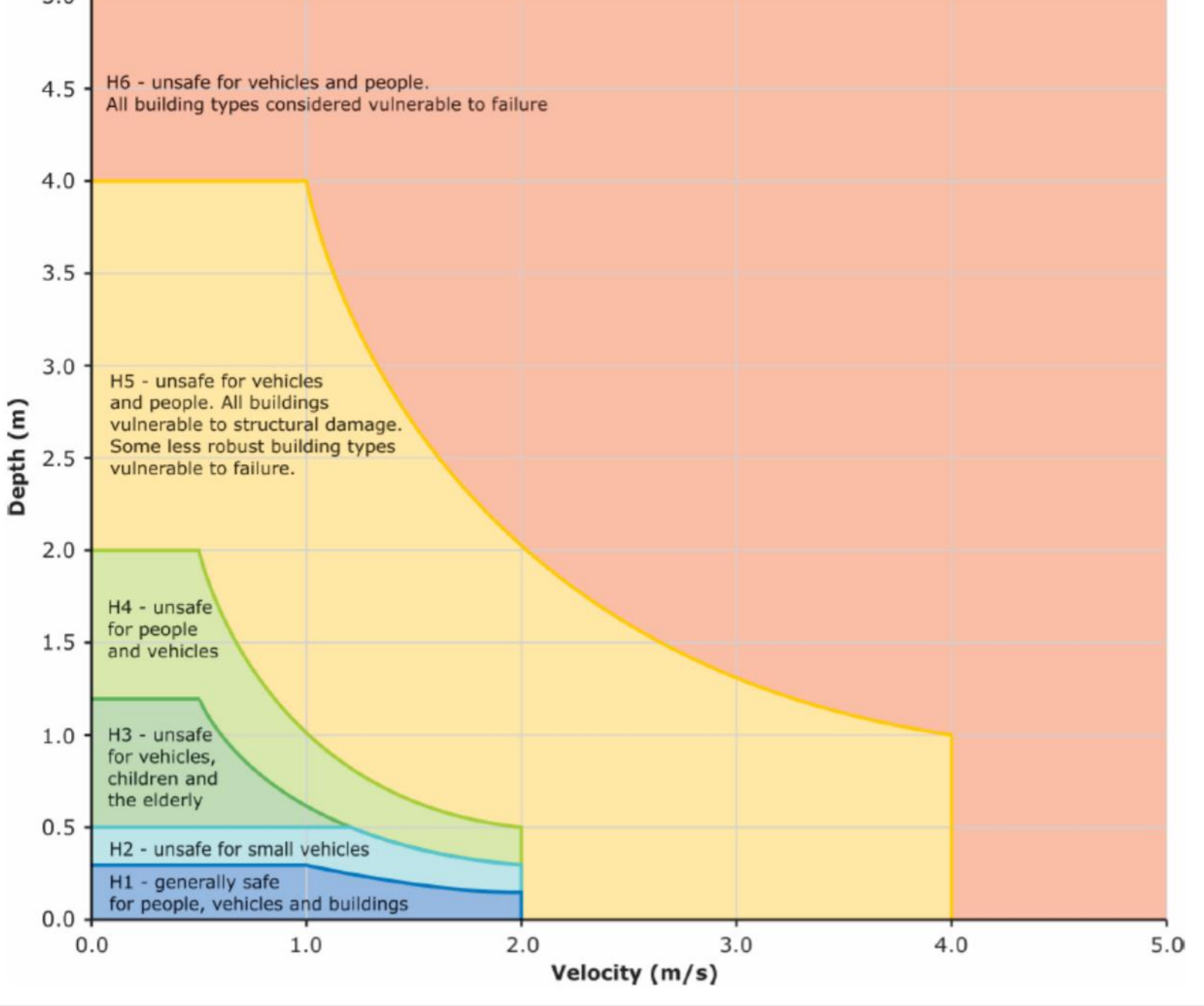
Model results are real time.

Initial Results




H6 - unsafe for vehicles and people.
All building types considered vulnerable to failure
H5 - unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
H4 - unsafe for people and vehicles
H3 - unsafe for vehicles, children and the elderly
H2 - unsafe for small vehicles
H1 - generally safe for people, vehicles and buildings
Depth (m)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Velocity (m/s)
0.0
1.0
2.0
3.0
4.0
5.0

Had

Initial R