



Geospatial Solutions

www.tonkintaylor.com

Geospatial Solutions at Tonkin + Taylor

We help project teams and decision-makers make better, faster, and more confident decisions by turning complex spatial data into clear, actionable insight.

Our team combines strong geospatial expertise with real project experience across infrastructure, environmental, transport, energy, and land development sectors. What sets us apart is our multidisciplinary approach - working alongside engineers, scientists, and specialists to ensure our outputs are grounded in real-world context and directly support better project outcomes.

We work closely with clients and project teams to understand the problem first, then deliver solutions that are practical, reliable, and fit for purpose.

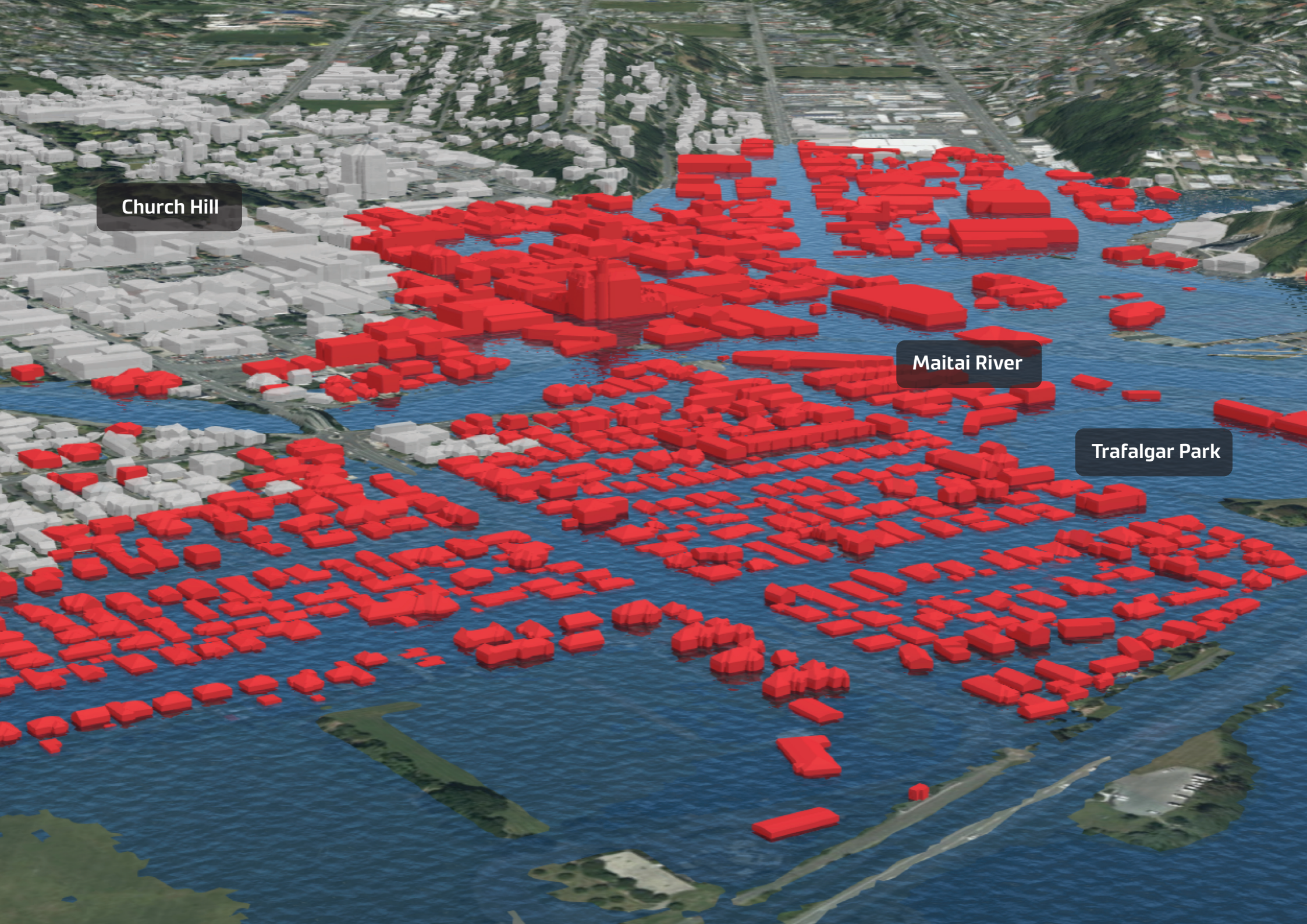
With capability across a wide range of systems and technologies, we are flexible in how we work - integrating data, automating processes, and delivering tools and visualisations that go beyond mapping to support real outcomes.

The examples throughout this showcase are drawn from real projects delivered by our Geospatial Solutions team - demonstrating how geospatial expertise, digital workflows, automation, and multidisciplinary collaboration can be applied to solve complex project challenges and deliver meaningful outcomes.

We thank our clients for allowing selected project imagery and outputs to be shared.

Our focus is simple

Reduce effort, reduce risk, and improve outcomes across the project lifecycle and beyond.

A 3D aerial view of a city area showing a flood simulation. The water is blue, and the buildings are represented by red and white blocks. The flood covers a large portion of the city, with some areas remaining dry. The labels 'Church Hill', 'Maitai River', and 'Trafalgar Park' are visible.

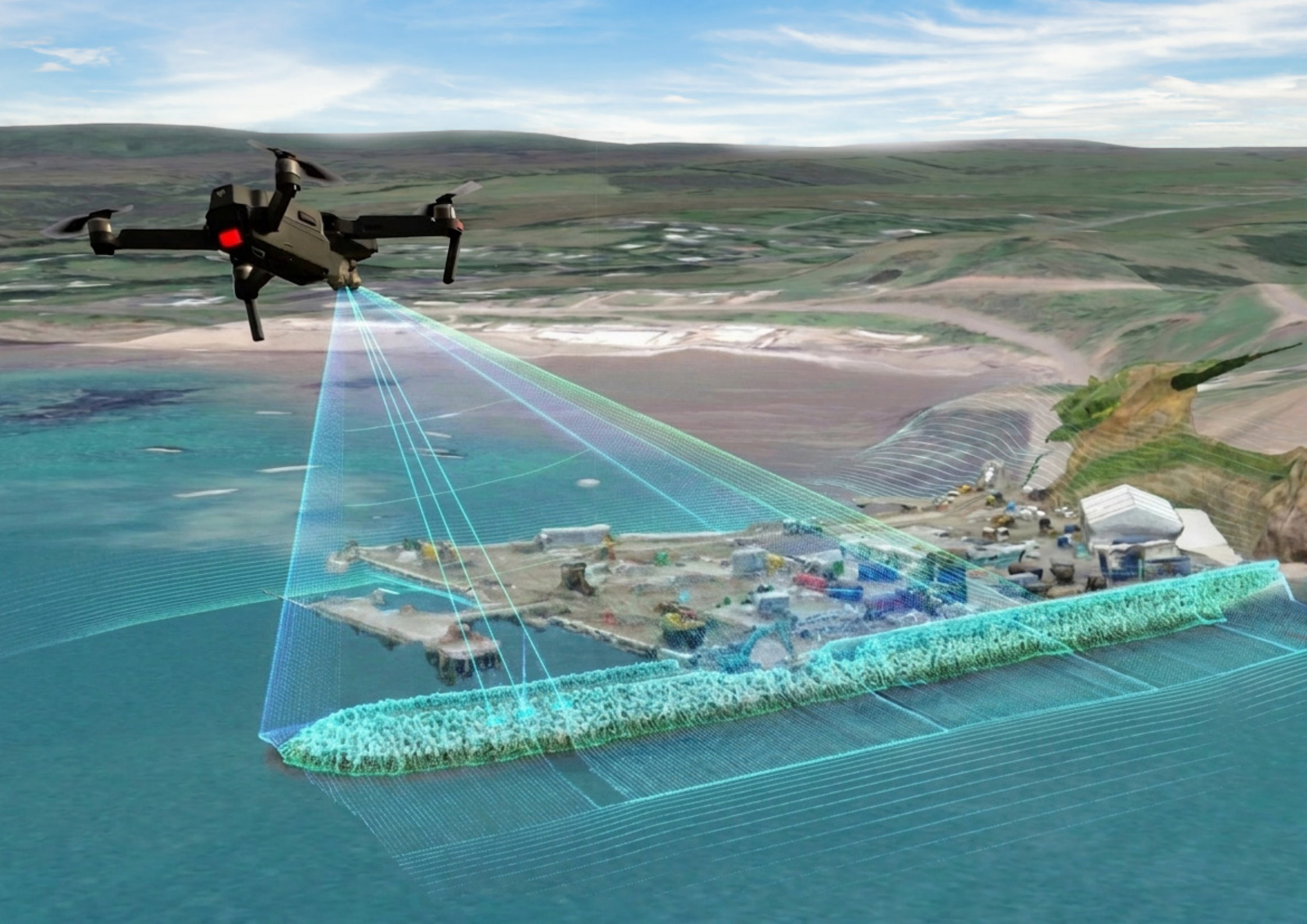
Church Hill

Maitai River

Trafalgar Park

Flood risk brought to life

Award-winning use of 3D flood visualisation to communicate future coastal risk, helping communities and decision-makers clearly understand potential impacts.



A decade of UAV + photogrammetry expertise

Capturing and processing high-resolution UAV imagery to create detailed 3D point clouds and textured mesh models that support engineering understanding, spatial analysis, and real-world project outcomes.

Canterbury region

Surface water irrigation schemes



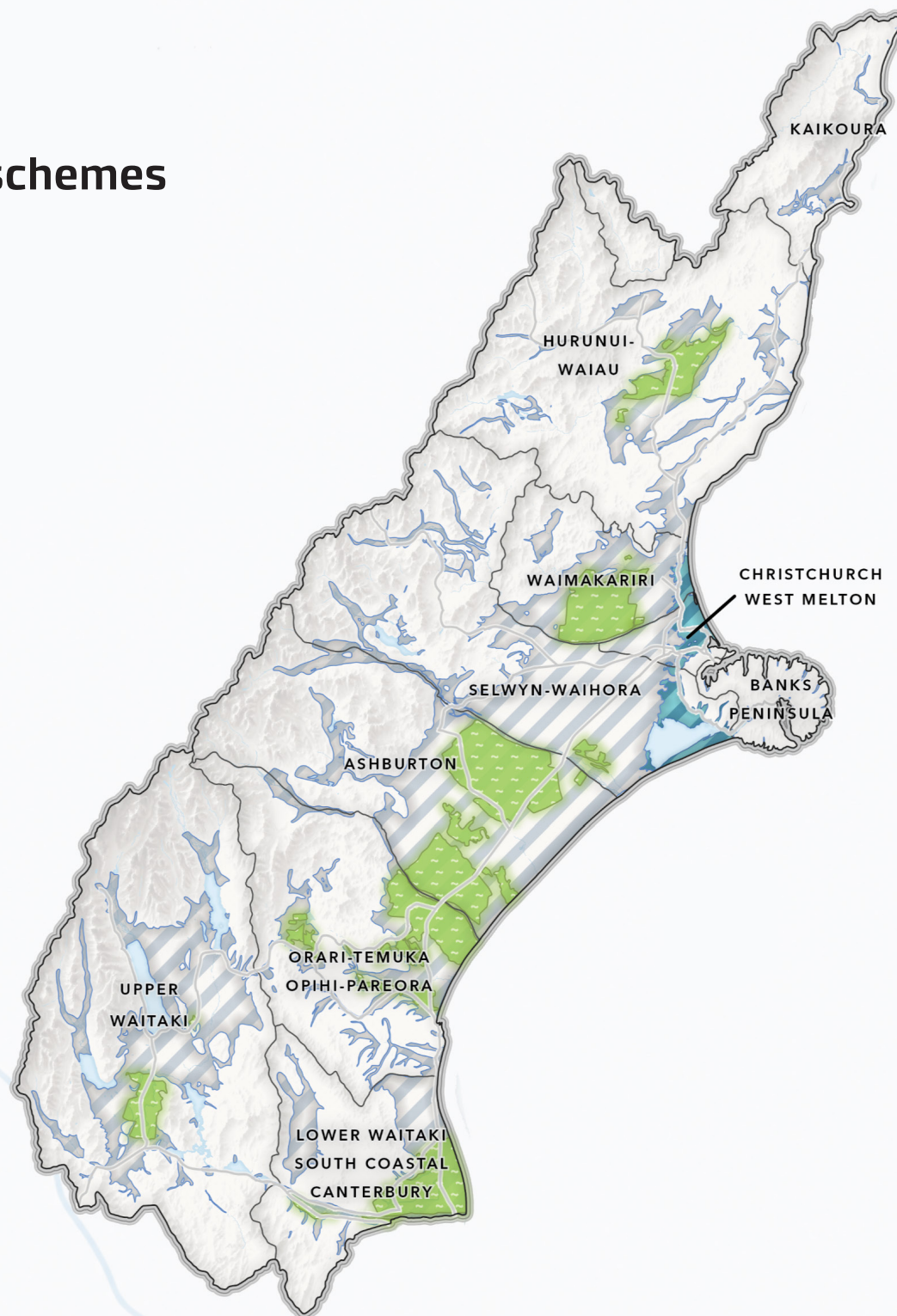
Coastal confirmed aquifers



Unconfirmed or
semiconfirmed aquifers



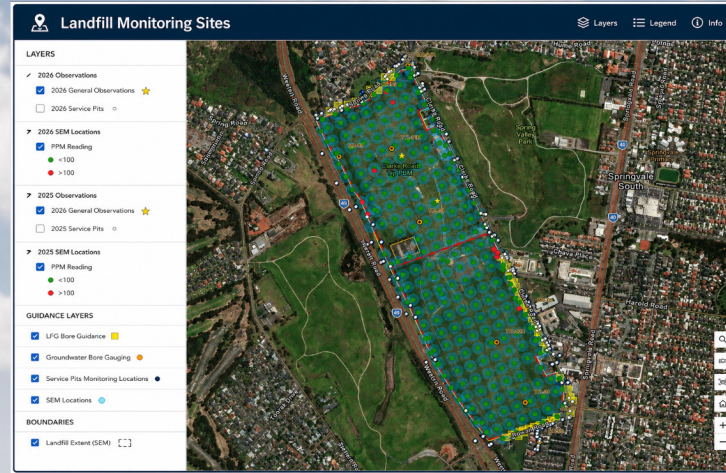
Irrigation scheme



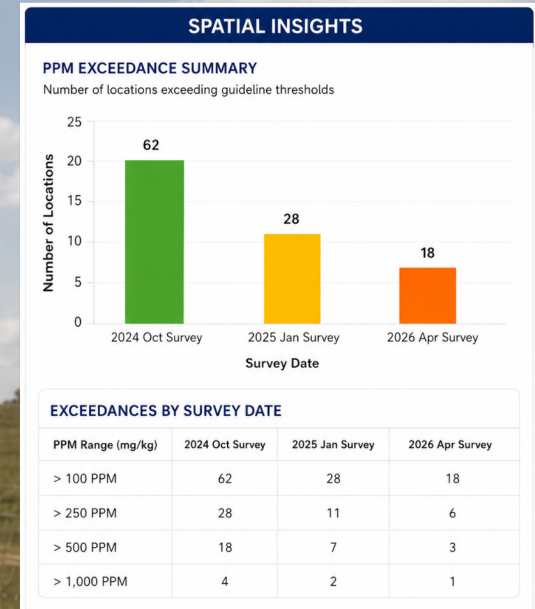
Understanding climate risk

Developing map-based insights that build a clear picture of climate risk across a region - helping decision-makers and communities understand impacts and plan for resilience.

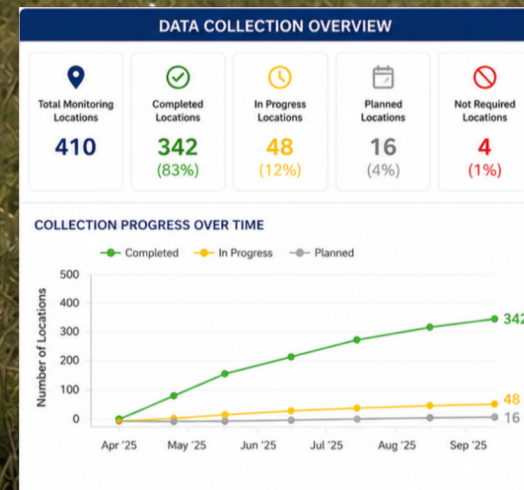
Field data capture



Generate spatial insights



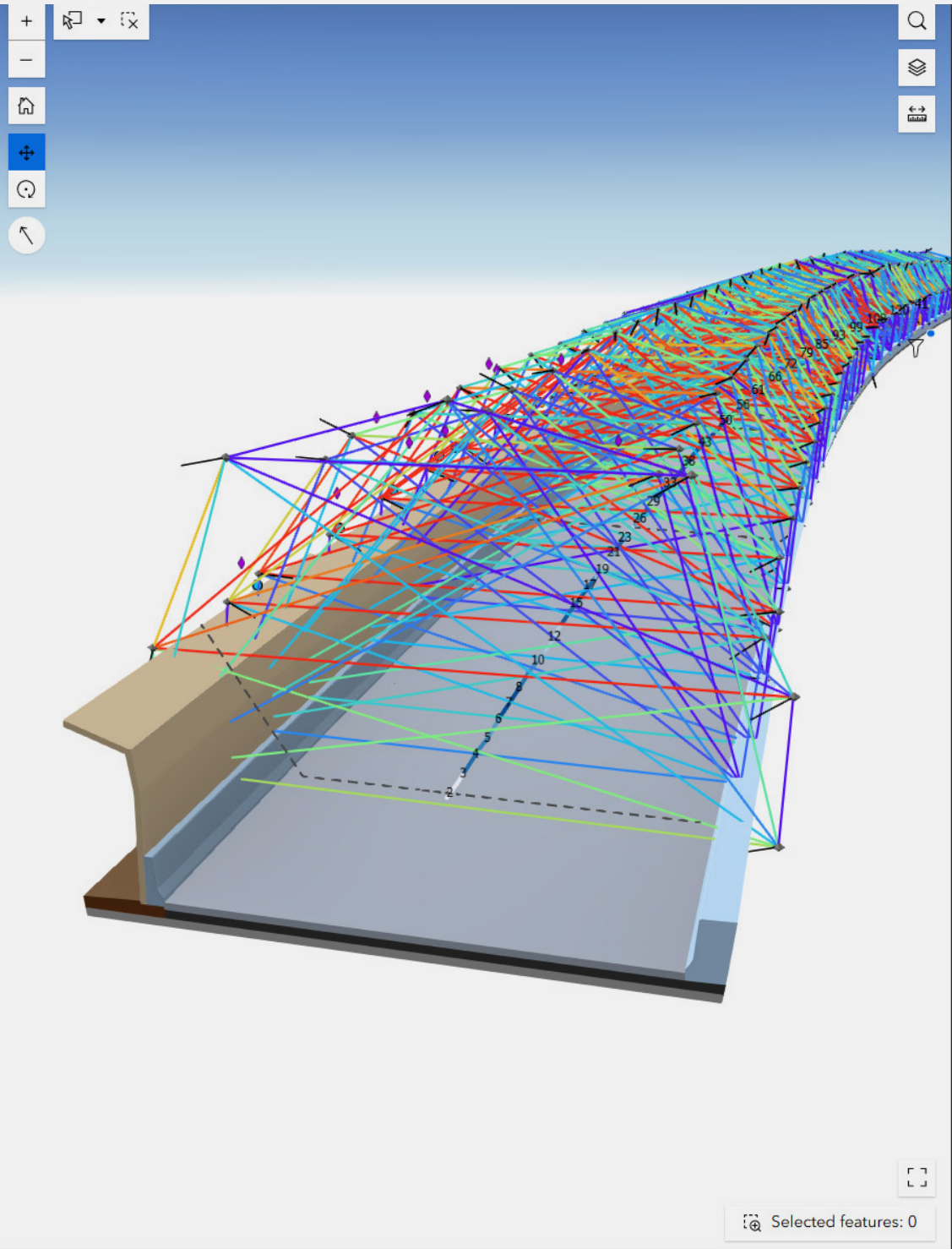
Operational management + Planning



Project oversight + reporting

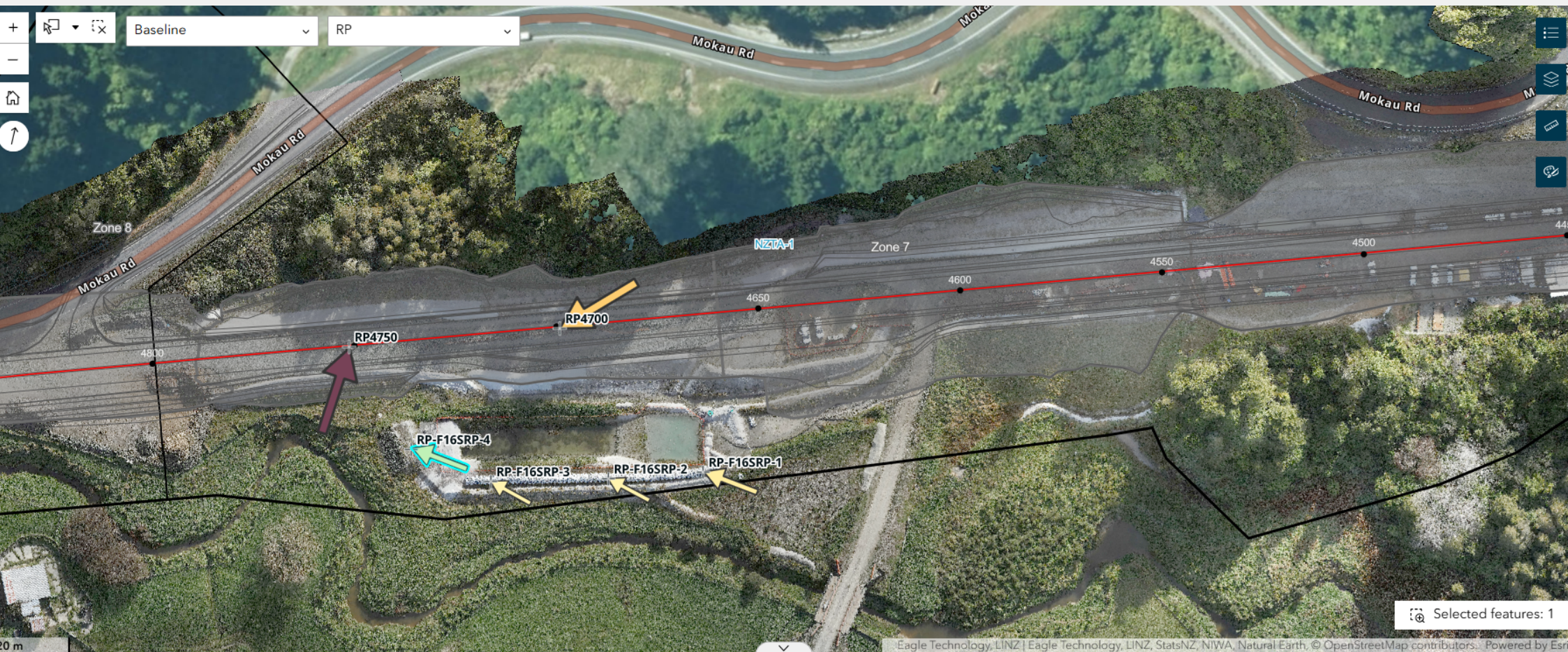
From the field to insights

Deploy digital field data capture solutions that bring map-based and form-based workflows together into a single connected system - improving consistency, reducing manual effort, and enabling faster access to reliable project information.

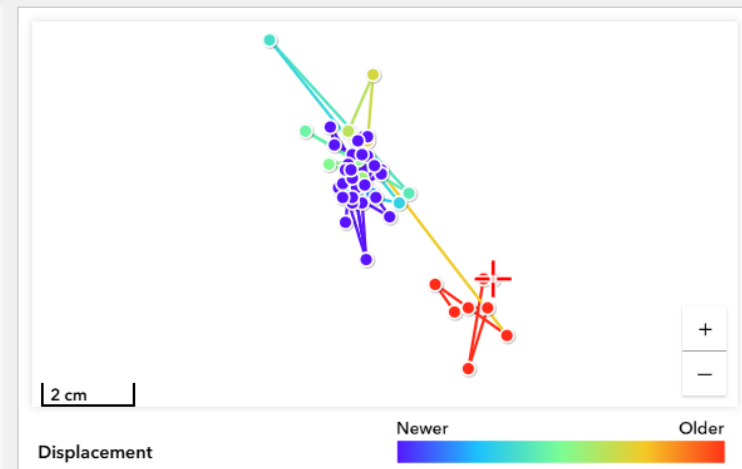
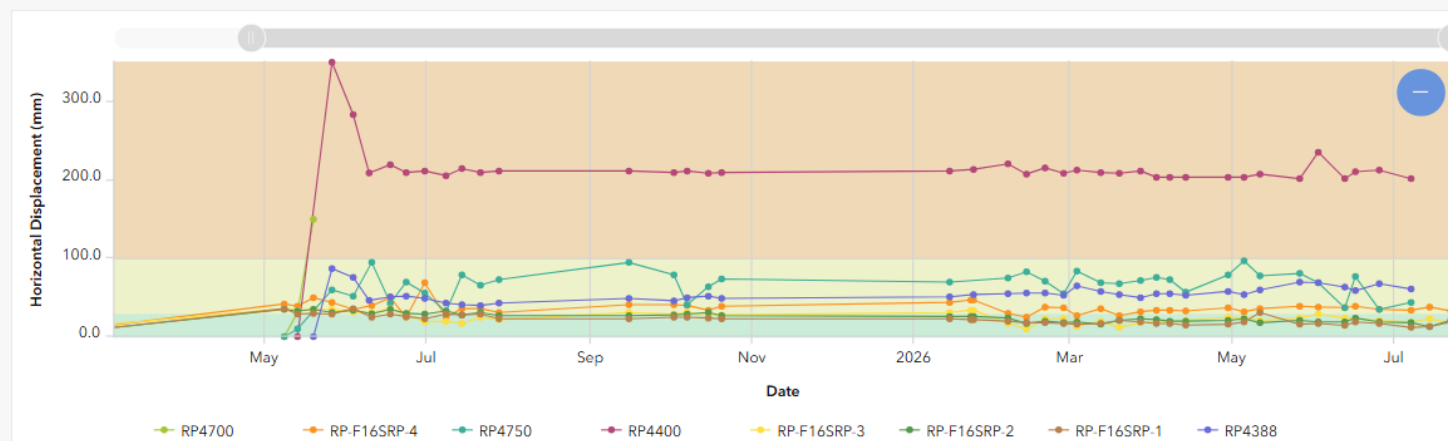


Understanding tunnel behaviour

2D and 3D visualisation of tunnel monitoring data - bringing convergence, cracking, and seepage into a single view to support informed construction decisions.



Details Alerts Total Displacement **Horizontal Displacement** Outward Displacement Vertical Displacement Table View Reports

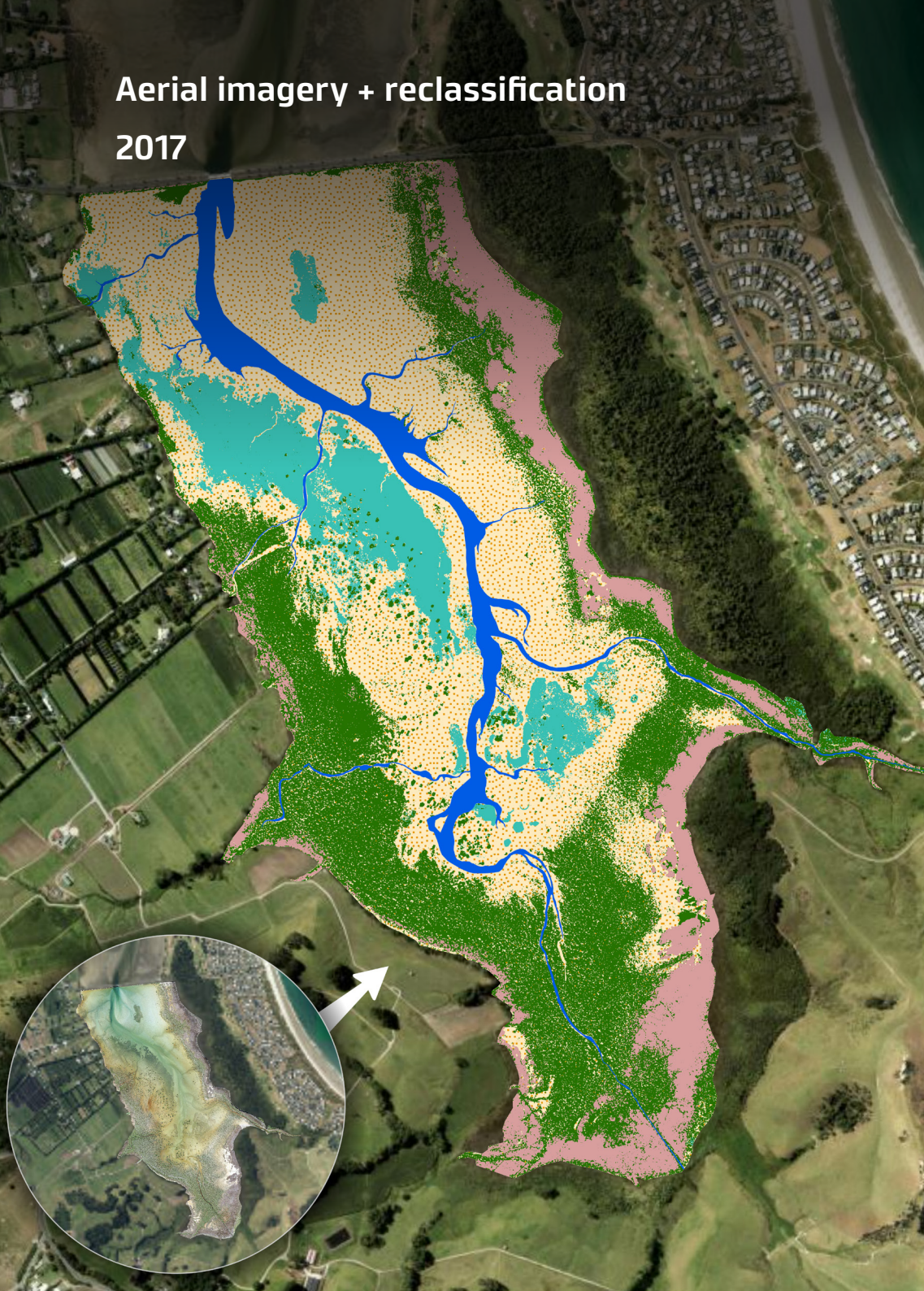


Monitoring risk in real time

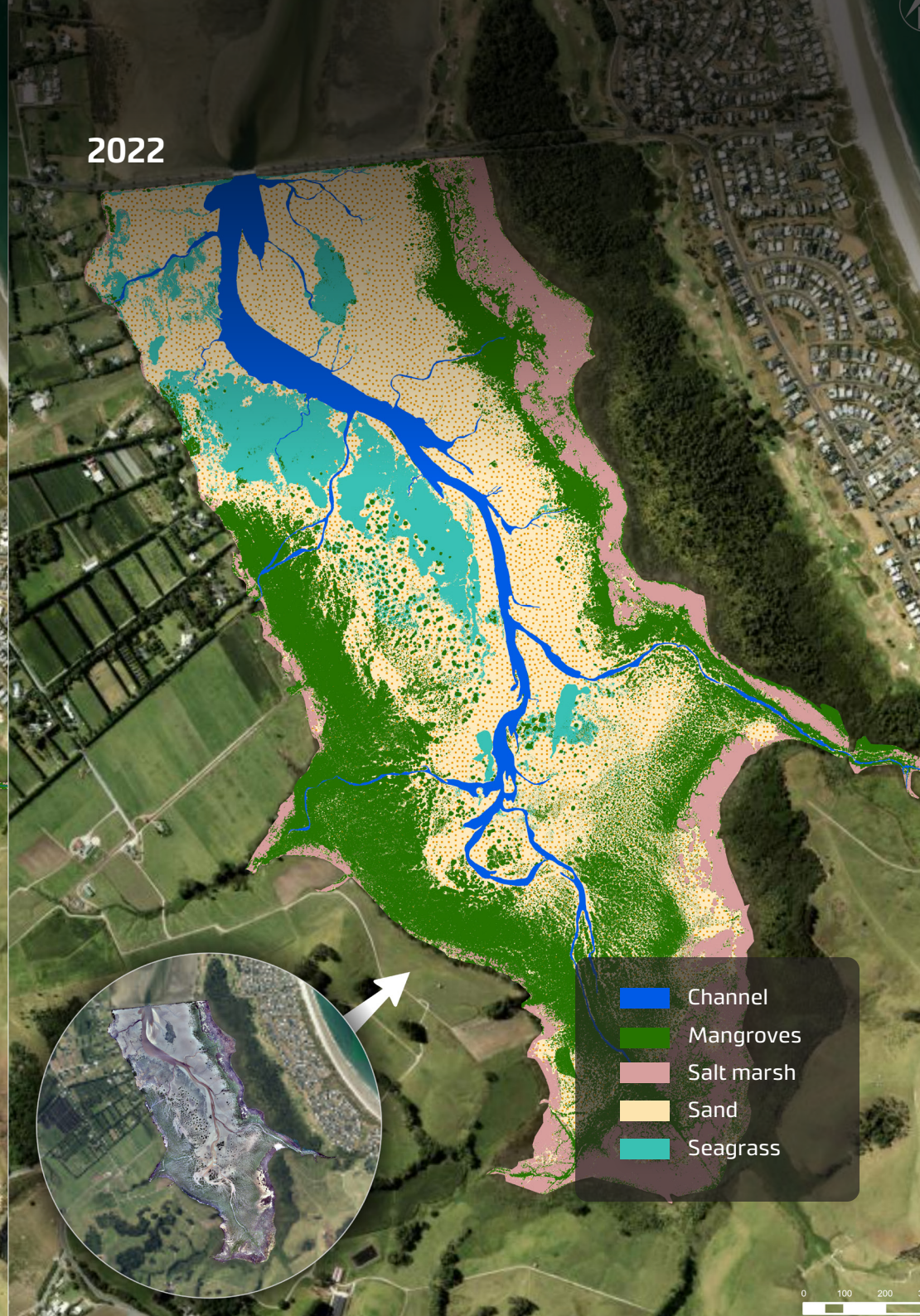
Dynamic visualisation of ground monitoring data - providing clear insight into geotechnical risk and construction compliance, with automated updates and user-driven analysis.

Aerial imagery + reclassification

2017



2022



- Channel
- Mangroves
- Salt marsh
- Sand
- Seagrass

Mapping marine change

Classifying aerial imagery to map marine habitats - enabling quantification of spatial and temporal change and supporting informed environmental decisions.

Newtown to city

Newtown to city is a 3km-long transport corridor that connects the southern suburbs of Wellington to the central city.

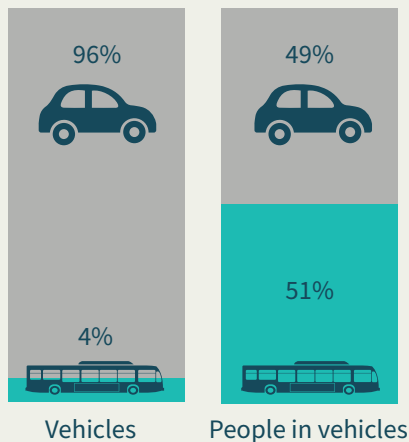
The Newtown corridor connects Newtown, Mt Cook and Mt Victoria to the central city. There are five public bus services operating on this corridor and 15 school services. This is also a primary part of the bike network.

There are several significant destinations along this route including Courtenay Place, Pukeahu National War Memorial, Basin Reserve, Wellington College, Wellington East Girls' College, Newtown shopping centre and the Wellington Regional Hospital.

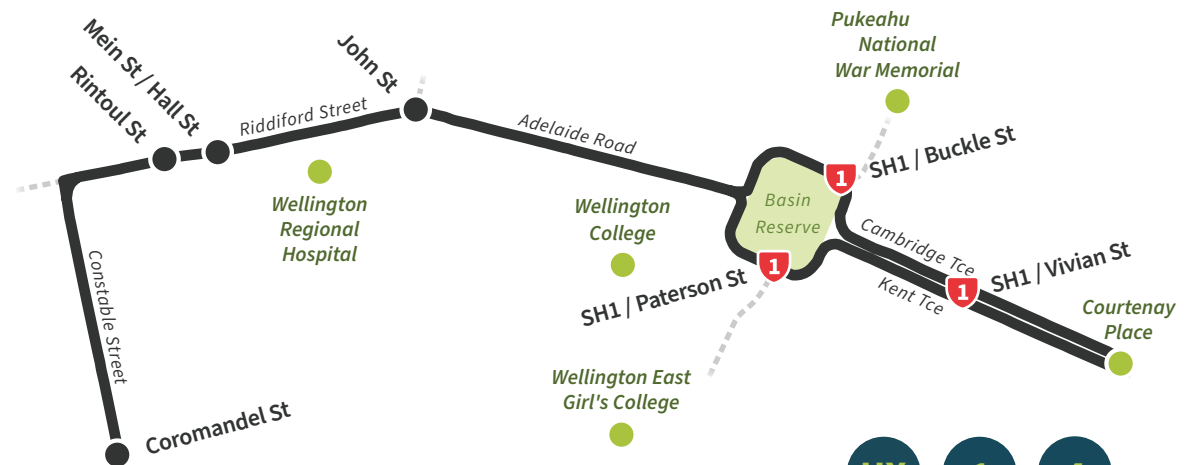
The land uses along the corridor are mainly central city or suburban shopping zones with one institutional precinct (Wellington Regional Hospital). The corridor also passes through the Newtown shopping heritage area.

There are bus lanes present between Newtown and the city, along sections of Cambridge Terrace / Kent Terrace, Adelaide Road and Riddiford Street with varying hours of operation.

Corridor traffic by mode of transport at Cambridge Terrace (8am-9am)



Route: Newtown to City



SERVICES USING CORRIDOR

*Services only using small sections of the corridor

**8,100+
DAILY
PASSENGERS**



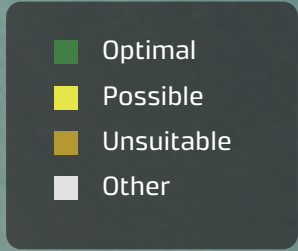
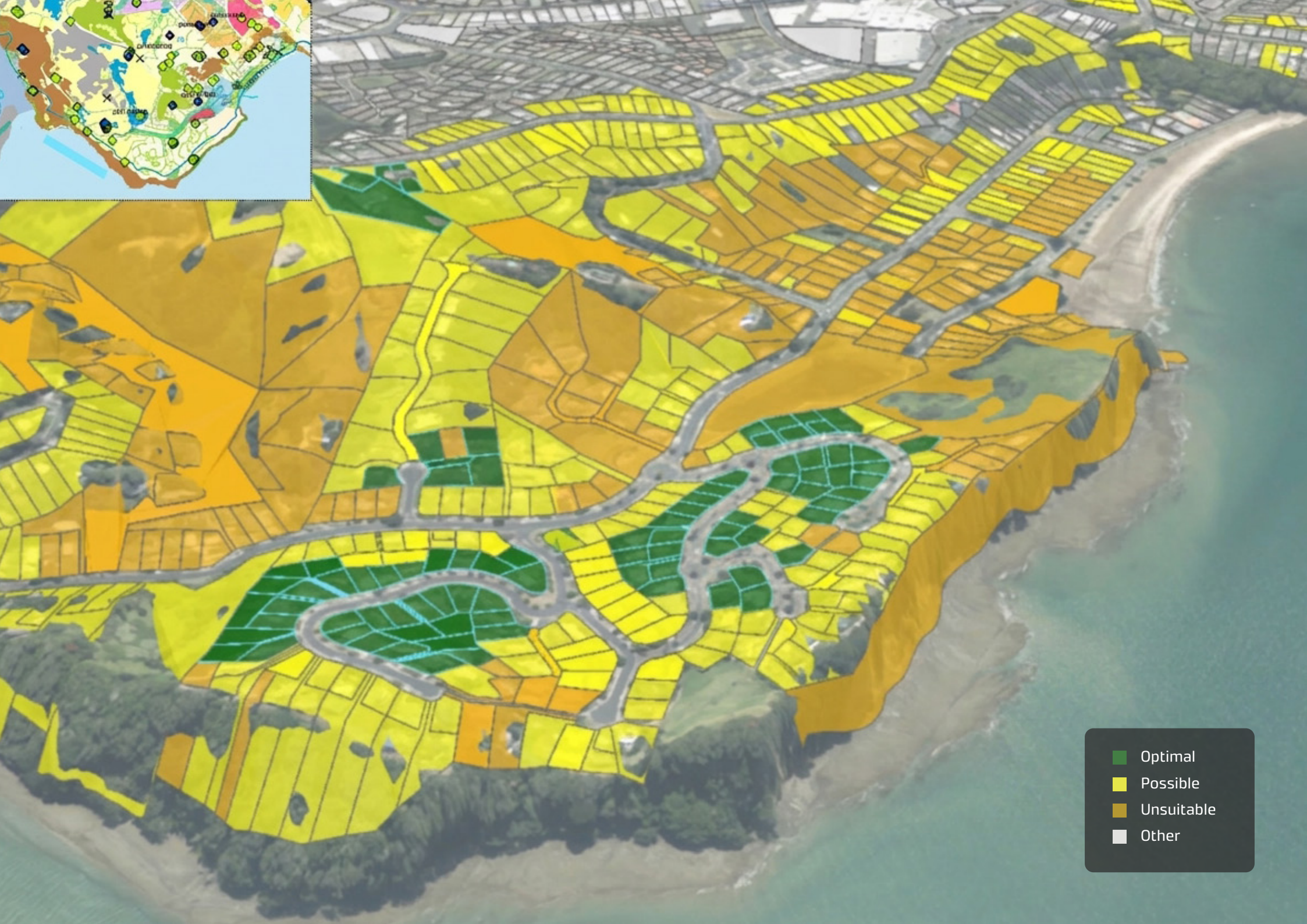
**1,000+
PASSENGERS TRAVEL ALONG RIDDIFORD
STREET IN THE AM PEAK**



**3km route – 12mins
AVERAGE JOURNEY TIME**

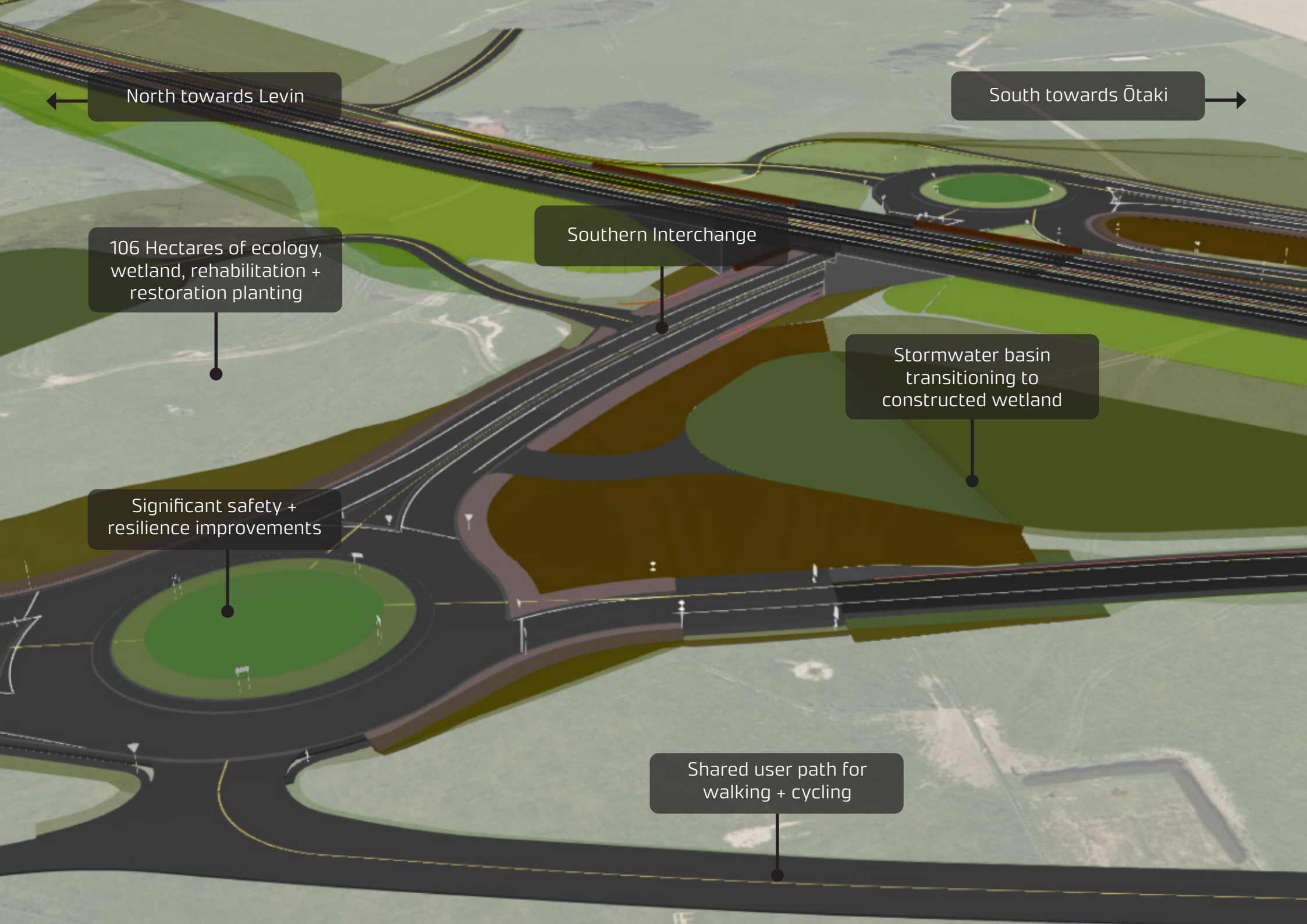
Improving public transport performance

Using passenger data to identify key bus corridors - delivering clear insights and practical solutions to improve reliability and network performance.



Informed investment decisions

Identify optimal sites for development with custom spatial analysis - supporting faster, more informed decisions while reducing time and cost.



North towards Levin

South towards Ōtaki

106 Hectares of ecology,
wetland, rehabilitation +
restoration planting

Southern Interchange

Stormwater basin
transitioning to
constructed wetland

Significant safety +
resilience improvements

Shared user path for
walking + cycling

One source of project truth

Centralised geospatial platform transforming and visualising project data - enabling multidisciplinary teams to access, understand, and act on information throughout design and construction.

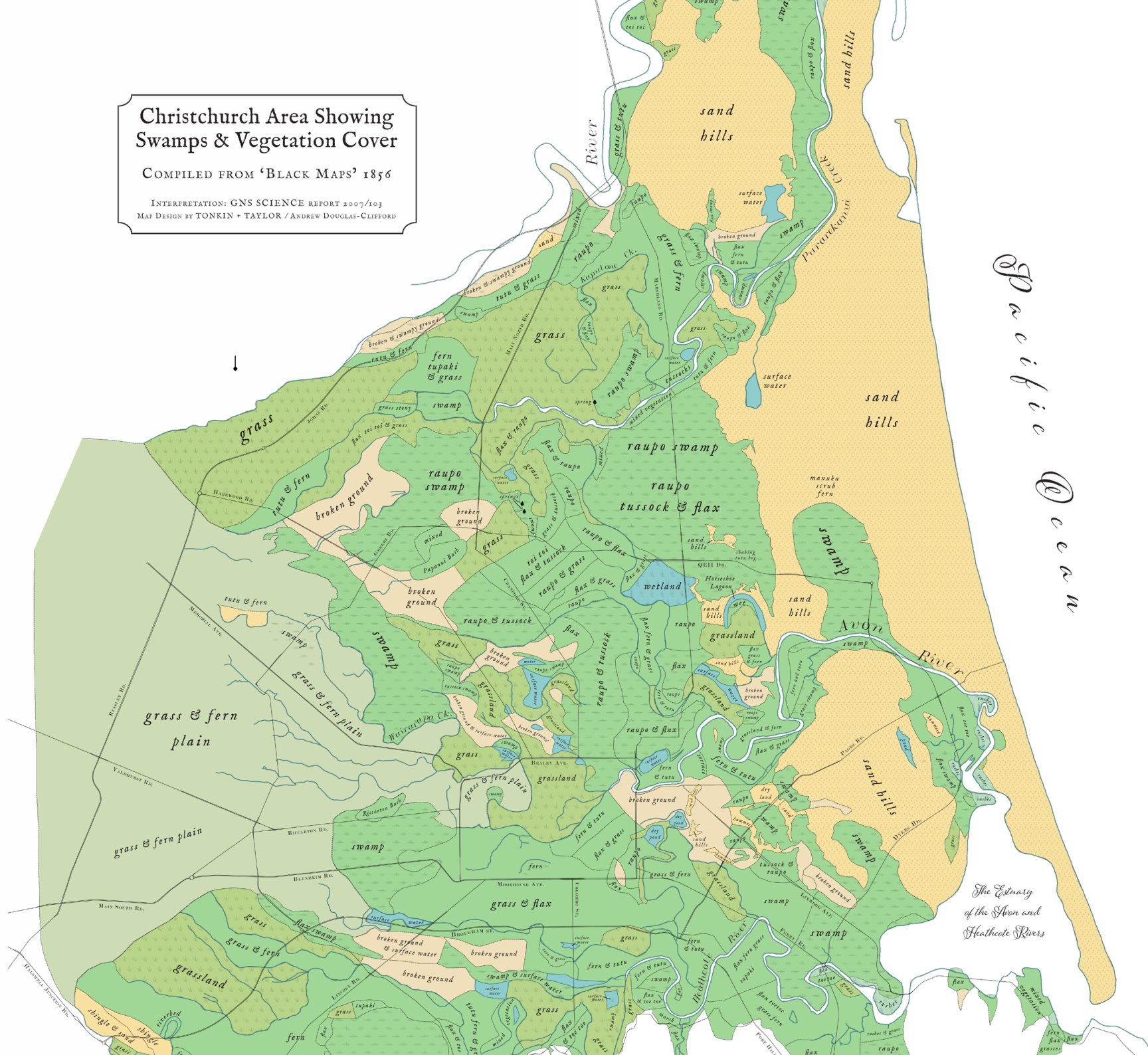
Transforming a 150-year-old geology map into a modern digital resource - providing accessible insights that inform development decisions and risk awareness.

Transforming a 150-year-old geology map into a modern digital resource - providing accessible insights that inform development decisions and risk awareness.

Christchurch Area Showing Swamps & Vegetation Cover

COMPILED FROM 'BLACK MAPS' 1856

INTERPRETATION: GNS SCIENCE REPORT 2007/103
MAP DESIGN BY TONKIN + TAYLOR / ANDREW DOUGLAS-CLIFFORD

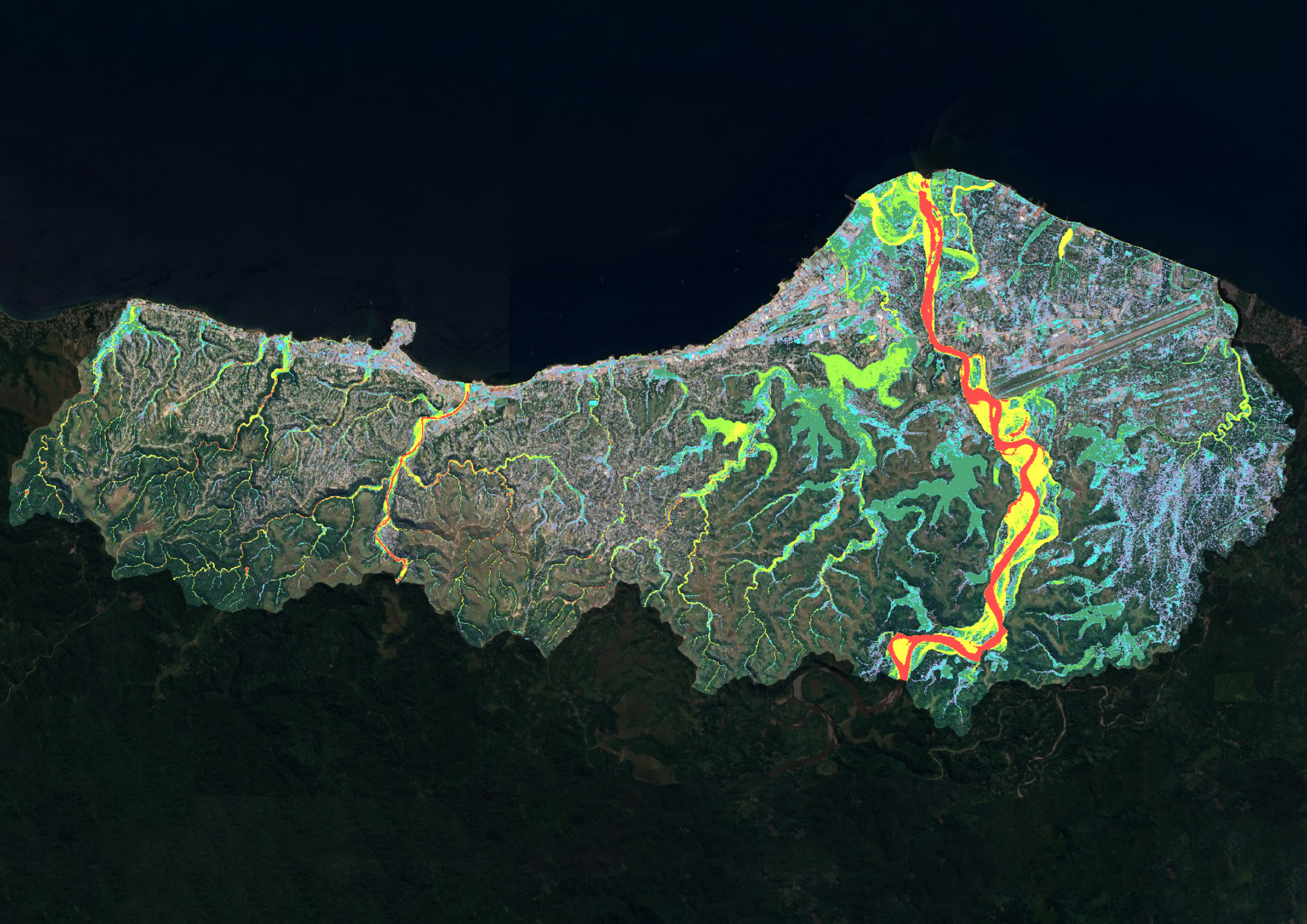


NORTH



Pacific Ocean

The Estuary of the Avon and Heathcote Rivers



Strengthening resilience

Strategic flood modelling for Greater Honiara - informing land-use planning, emergency response, and investment decisions to strengthen the city's resilience to flooding.



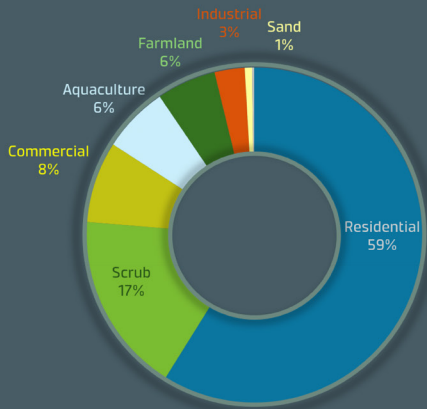
Understanding slope risk

Automated slope setback analysis identifies and quantifies stability hazards- helping teams target investigations and make informed decisions based on site-specific conditions.

Kiribati | South Tarawa

Landuse + Population

Landuse



Landuse

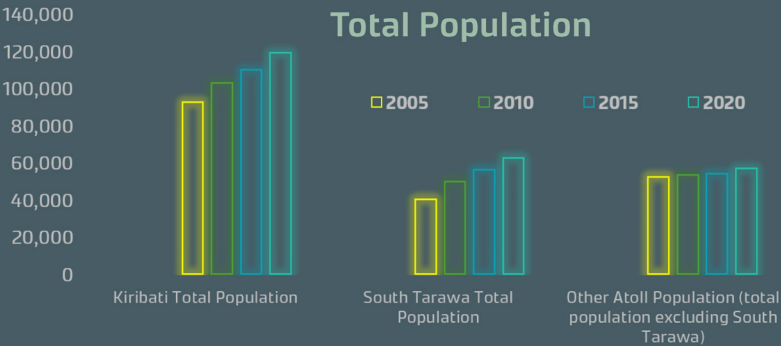
- Scrub
- Sand
- Residential
- Commercial

- Industrial
- Aquaculture
- Farmland
- Other

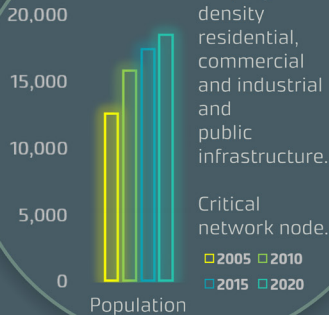
Key Assets

- Health center
- School
- Place of worship
- Police or fire station
- Park
- Telecom
- Transport
- Other public
- Fuel tank/station

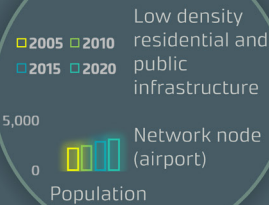
Total Population



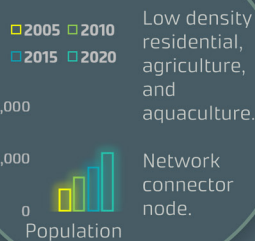
Betio



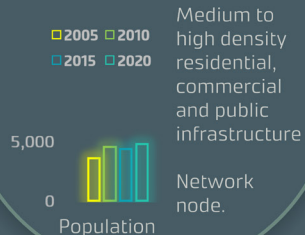
Bonriki



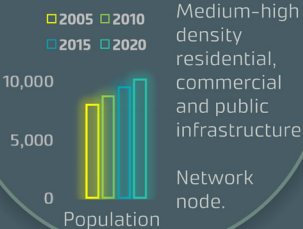
Temaiku



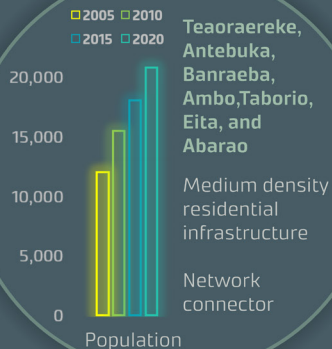
Bairiki & Nanikai



Bikenibeu and Ananau Causeway



Teaoraereke, Antebuka, Banraeaba, Ambo, Taborio, Eita, and Abarao



0 2,500 5,000 m

Climate risk made clear

Visual infographics communicating climate risks and adaptation options - supporting informed planning and meaningful community engagement across Pacific atoll nations.

Park Buildings (Unleased)

Extreme



High



Moderate



None



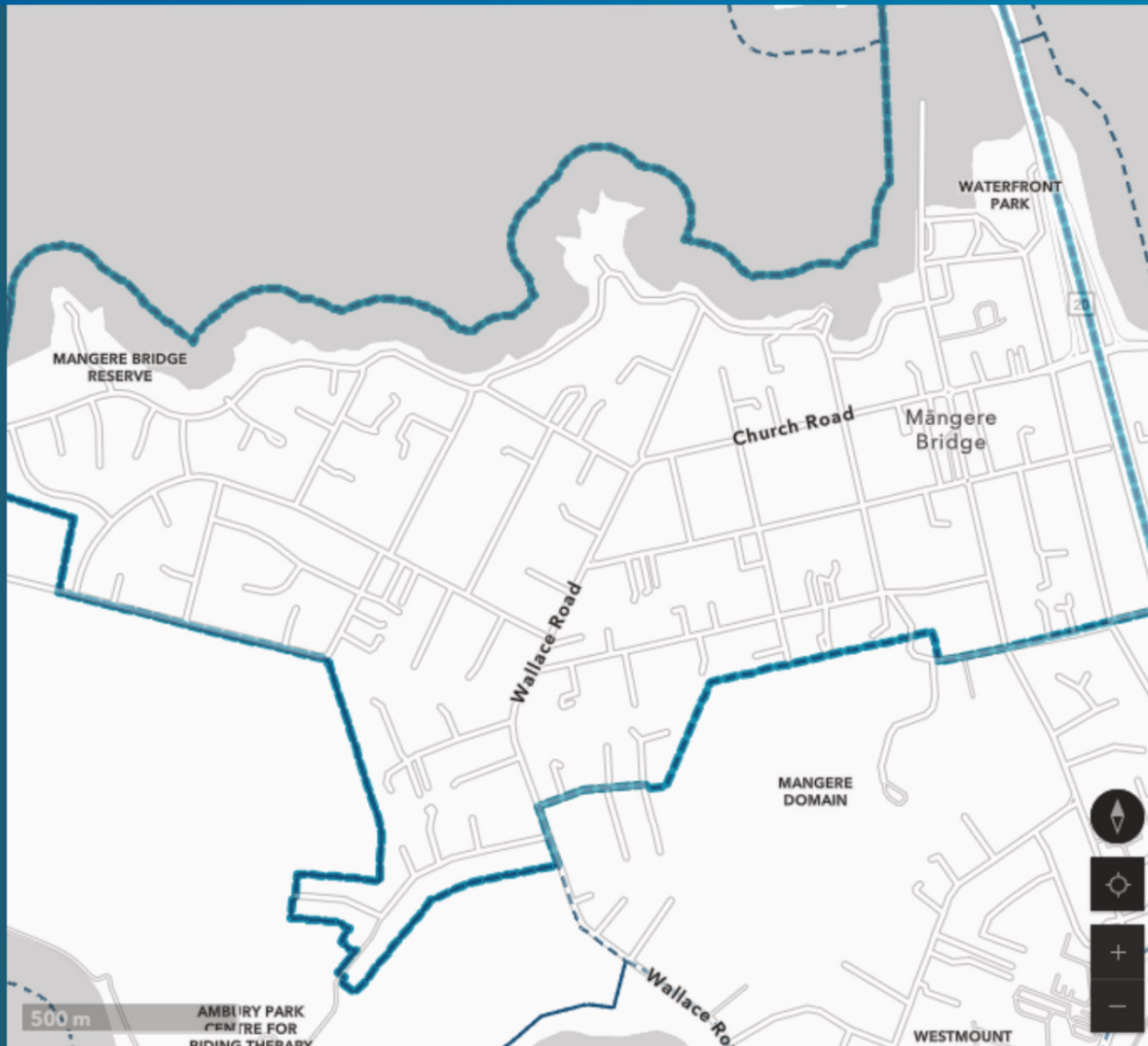
Cultural Heritage Index
Locations
Extreme



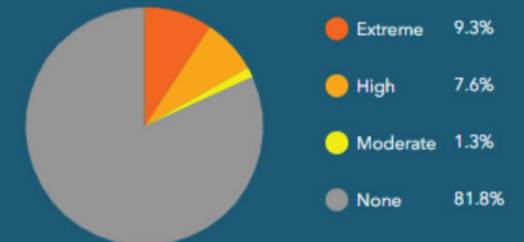
High



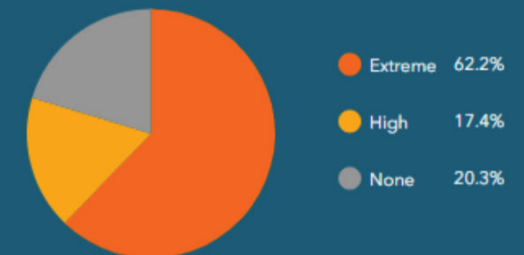
No Risk



Park Extent



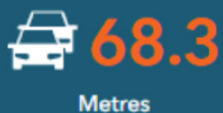
Significant Ecological Area



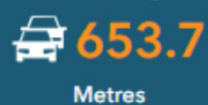
Historic Heritage Extent of Place



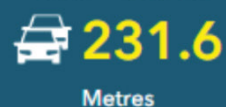
Roads - Extreme



Roads - High



Roads - Moderate

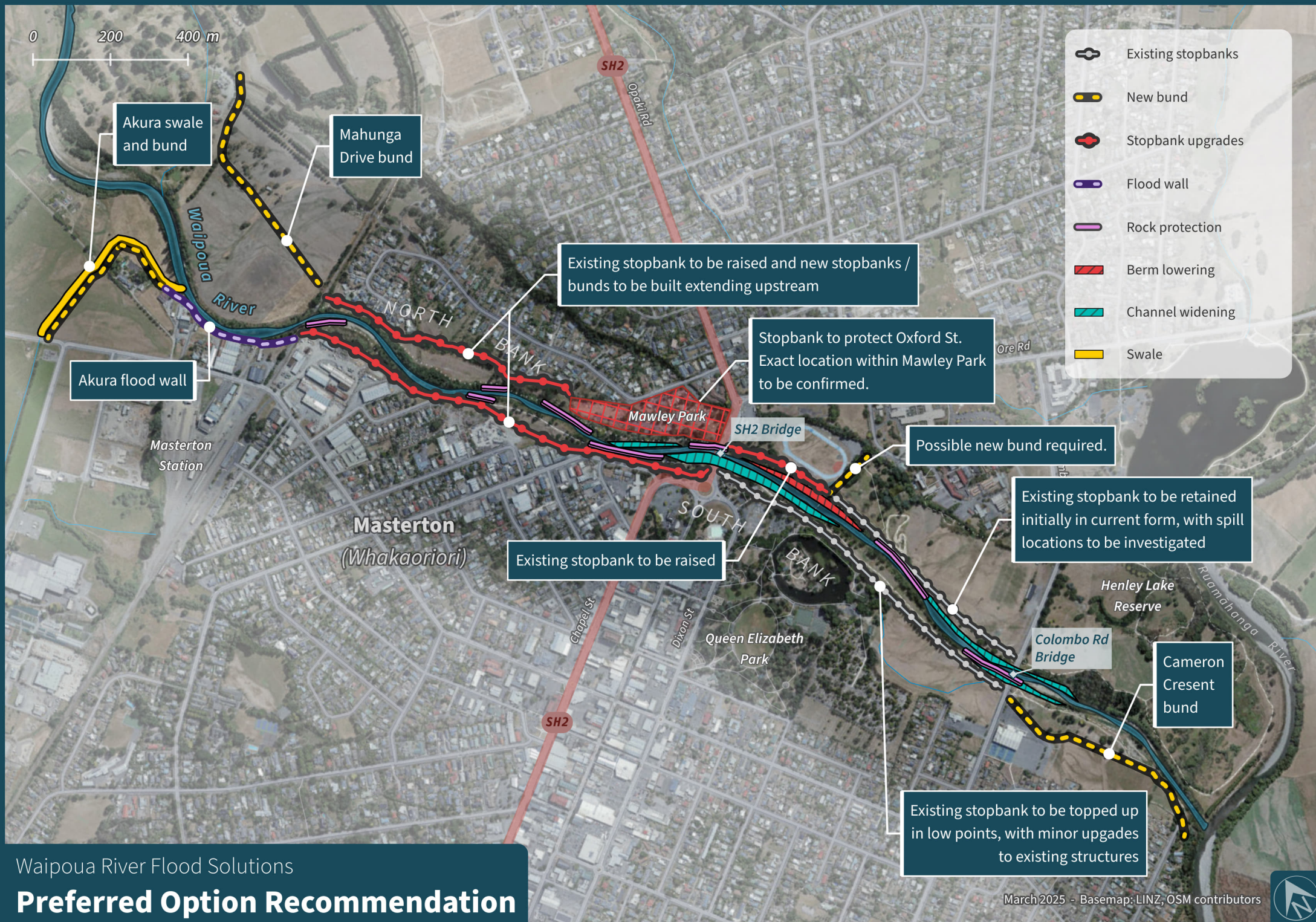


Roads - No Risk



Prioritising coastal risk

Geospatial risk modelling integrating asset and hazard data - enabling prioritisation of at-risk areas and supporting informed shoreline adaptation planning.



Waipoua River Flood Solutions

Preferred Option Recommendation

March 2025 - Basemap: LINZ, OSM contributors



Clear choices for communities

Map-based visualisation of stop-bank upgrade options
- supporting transparent consultation and informed
decision-making during public engagement.

Ruatoria

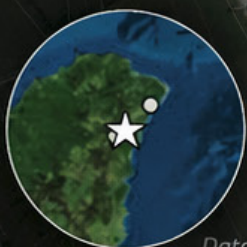
Buildings Suitable for Solar Generation

Mean Annual Potential
(MWh/yr)



Assumes a 21.6% efficiency and performance ratio of 83%, and a total roof productive area greater than 30 sqm

Tonkin+Taylor



Data: LINZ, Eagle, OSM

0 280 560 m



Rooftop solar mapped

LiDAR-based analysis of roof area and aspect - revealing solar potential across communities and supporting informed energy decisions.

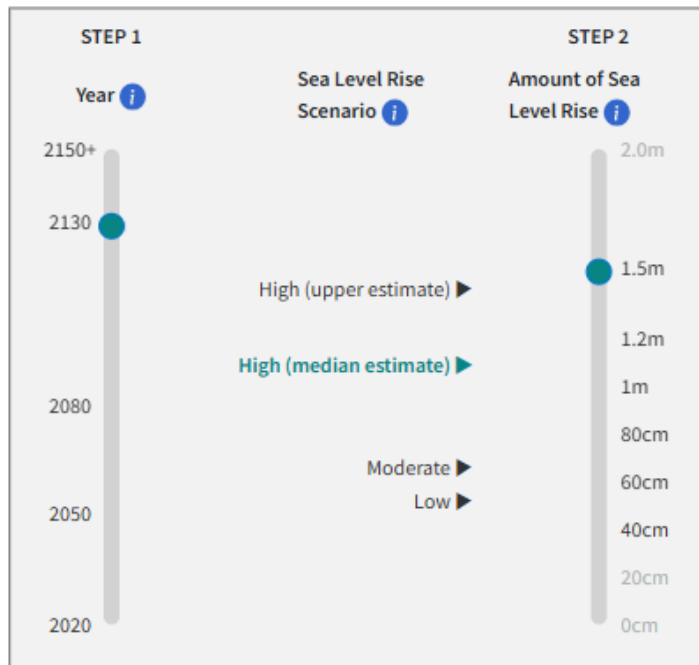
Areas projected to be susceptible to erosion in the year 2130 with 1.5m of sea level rise

This amount of sea level rise could be reached [between 2135 and 2150+](#), depending on future greenhouse gas emissions and how the environment responds.

To start viewing the map, select a location from the options below.

Christchurch Coast

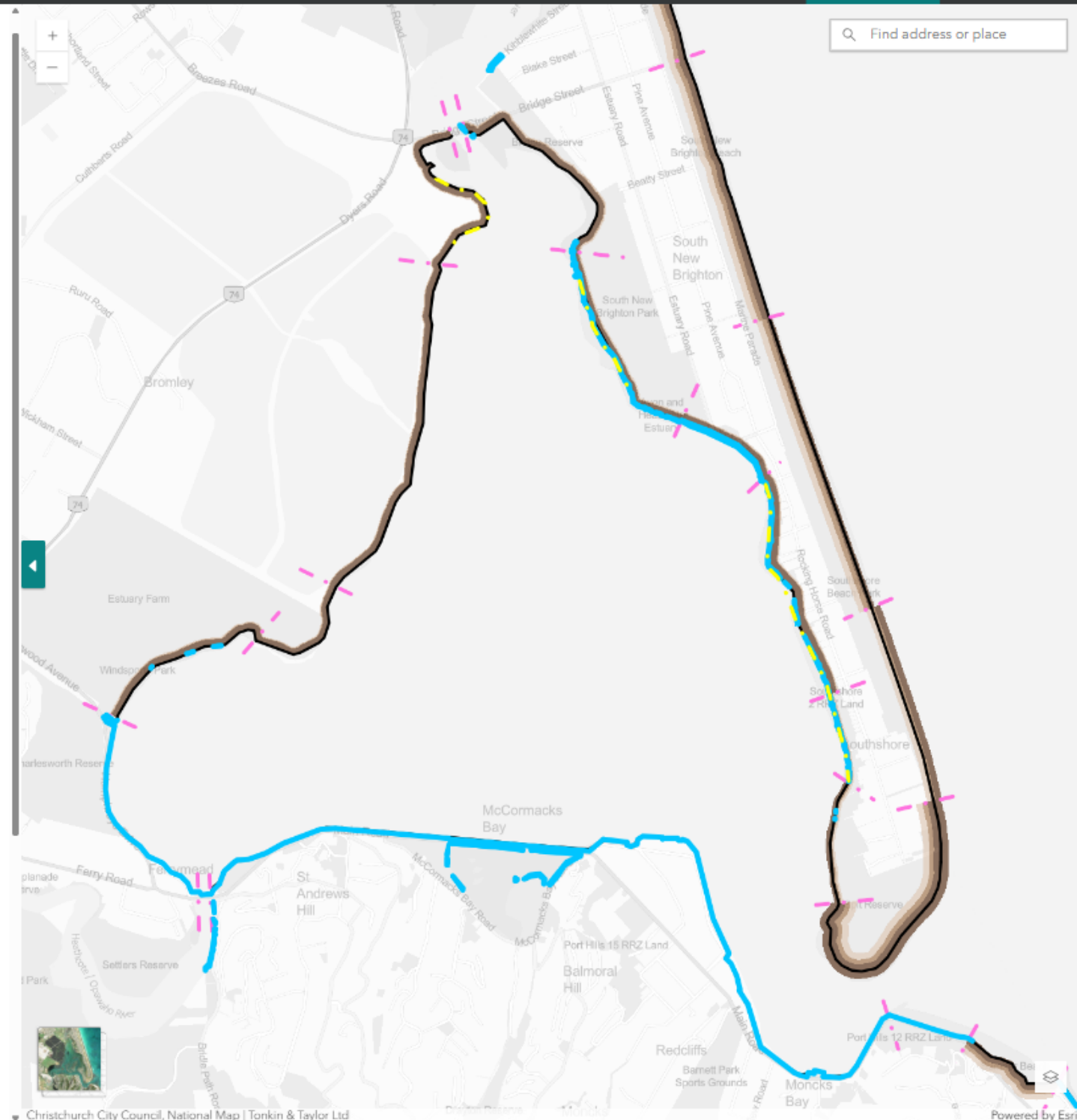
Show map of areas



Use the sliders to choose the timeframe and sea level rise, which will change the hazards shown on the map.

- Step 1: Use the 'Year' slider to select how far into the future you want to go. This will adjust the arrows to show the range of sea level rise scenarios in that year.
- Step 2: Use the 'Amount of Sea Level Rise' slider to see how the hazards shown on the map change depending on how much sea level rise occurs.

The map to the right shows the chances of land being affected by erosion in future. Whether or not erosion occurs at a particular location is influenced by the four key factors described below.



Coastal risk, made accessible

Interactive web platform presenting coastal hazard information - helping communities and decision-makers understand how risks may change with sea level rise.



Te Ara o Te Ata

 WAKA KOTAHITransport New Zealand

Mt Messenger Bypass

Data Displayed in this Dashboard is Dated 25th May 2026.

Vegetation Clearance Avoided

Areas within original design not required to be felled

Remaining Vegetation Clearance

Areas within original design that are yet to be felled

Vegetation Clearance Within Original Design

Vegetation Clearance Occurrence

Vegetation Clearance Exceeding Original Design

Vegetation Clearance Occurrence

Original Design refers to the 2017 Original Design Footprint and the Auxiliary Works Area (AWA). **Vegetation Clearance Occurrence:** The spatial delineation of these layers have been digitized from drone captured aerial imagery.

Select a Zone

☐ Zone 1

☐ Zone 10

☐ Zone 2

☐ Zone 3

☐ Zone 4

☐ Zone 5

☐ Zone 6

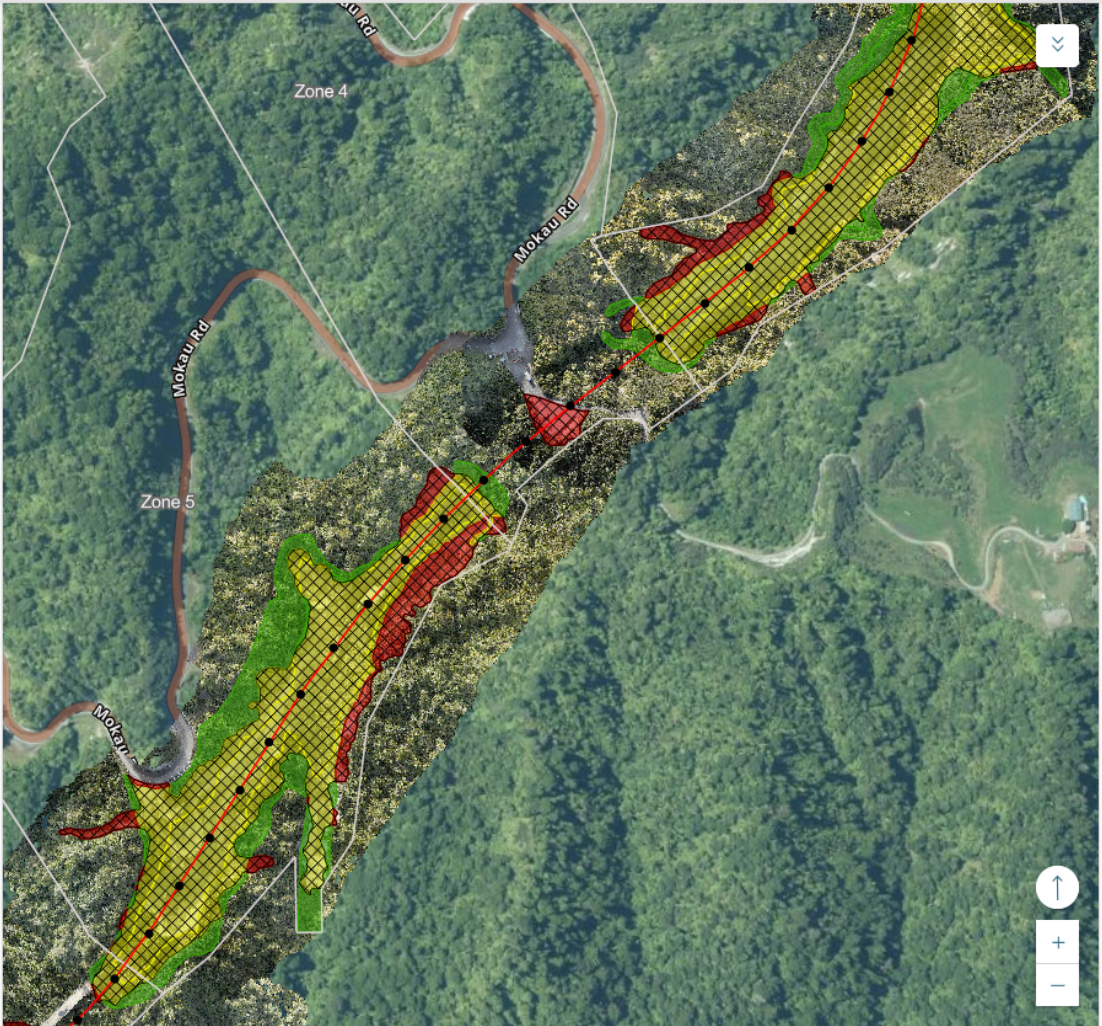
☐ Zone 7

☐ Zone 8

☐ Zone 9

Reset

Select all



Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors | Eagle Technology, LINZ, StatsNZ, NI... Powered by Esri

Zone	Original Design Area (Ha)	Vegetation Clearance Area (Ha)	Difference in Area (Ha)	Net Vegetation Loss Status
Zone 1	0.59	0.55	0.04	Net Within Original Design Total
Zone 10	0	0	0	
Zone 2	24.68	0.24	24.44	Net Within Original Design Total
Zone 3	9.5	8.27	1.23	Net Within Original Design Total
Zone 4	0.3	0.29	0.01	Net Within Original Design Total
Zone 5	4.6	4.12	0.48	Net Within Original Design Total
Zone 6	0.25	0.29	-0.04	Net Exceedance
Zone 7	3.9	2.07	1.83	Net Within Original Design Total
Zone 8	0.05	0	0.05	Net Within Original Design Total
Zone 9	0	0	0	

The numbers below summarize the amount of vegetation clearance that has occurred over the project site. These numbers will display by Zone when the zone filter is applied.

Actual Vegetation Clearance / Original Design

15.8

—out of—

46.2

A fraction displaying the area of clearance that has occurred to the area proposed in the original design + AWA (Hectares)

Projected Vegetation Clearance / Original Design

40.1

—out of—

46.2

A fraction displaying the area of clearance that is PROJECTED to occur to the area proposed in the original design + AWA (Hectares)

Actual Vegetation Clearance within Original Design + AWA (Ha)

13.5

Area value in hectares, for the vegetation clearance that has occurred spatially within original design + AWA

Projected Vegetation Clearance within Original Design + AWA (Ha)

37.8

Area value in hectares, for the PROJECTED vegetation clearance within the original design + AWA

Vegetation Clearance Exceeding the Original Design + AWA (Ha)

2.3

Area value in hectares, for the vegetation clearance that has occurred spatially outside of the original design + AWA

Remaining Vegetation Clearance (Ha)

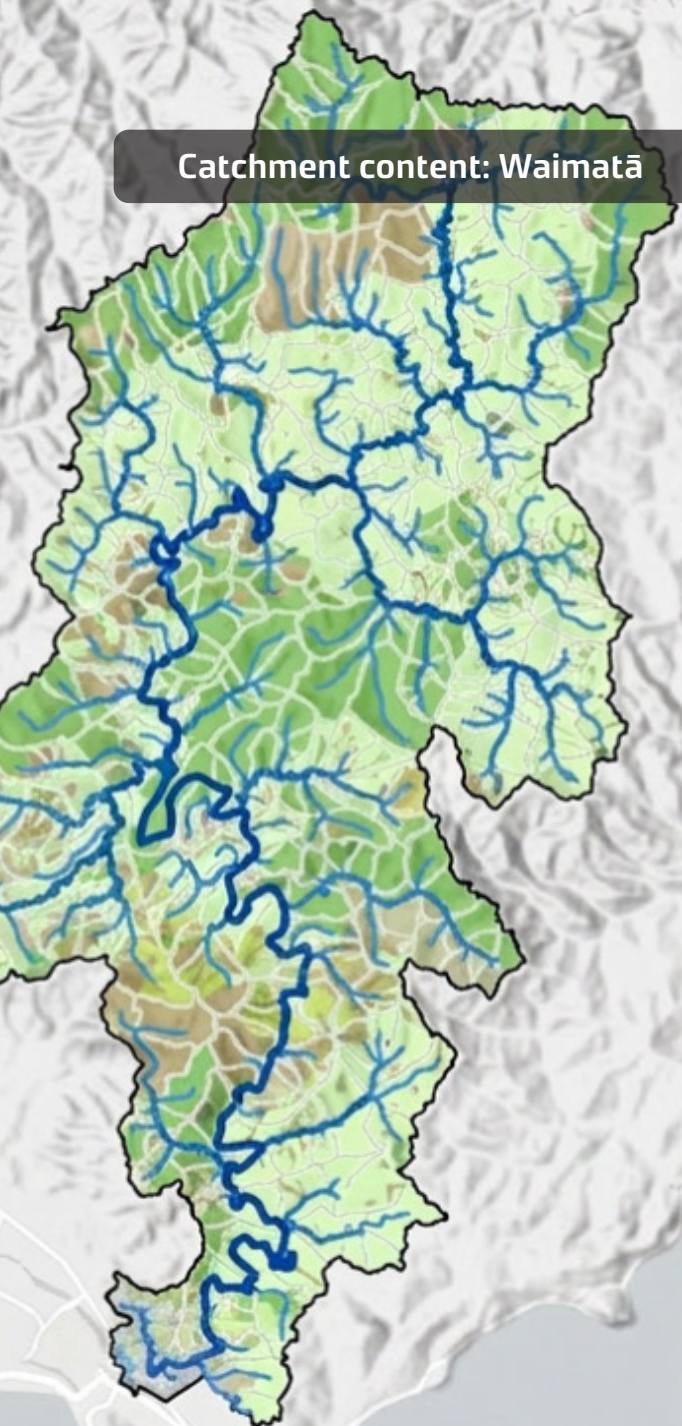
24.3

Area value in hectares, for the remaining vegetation clearance based off the original design + AWA

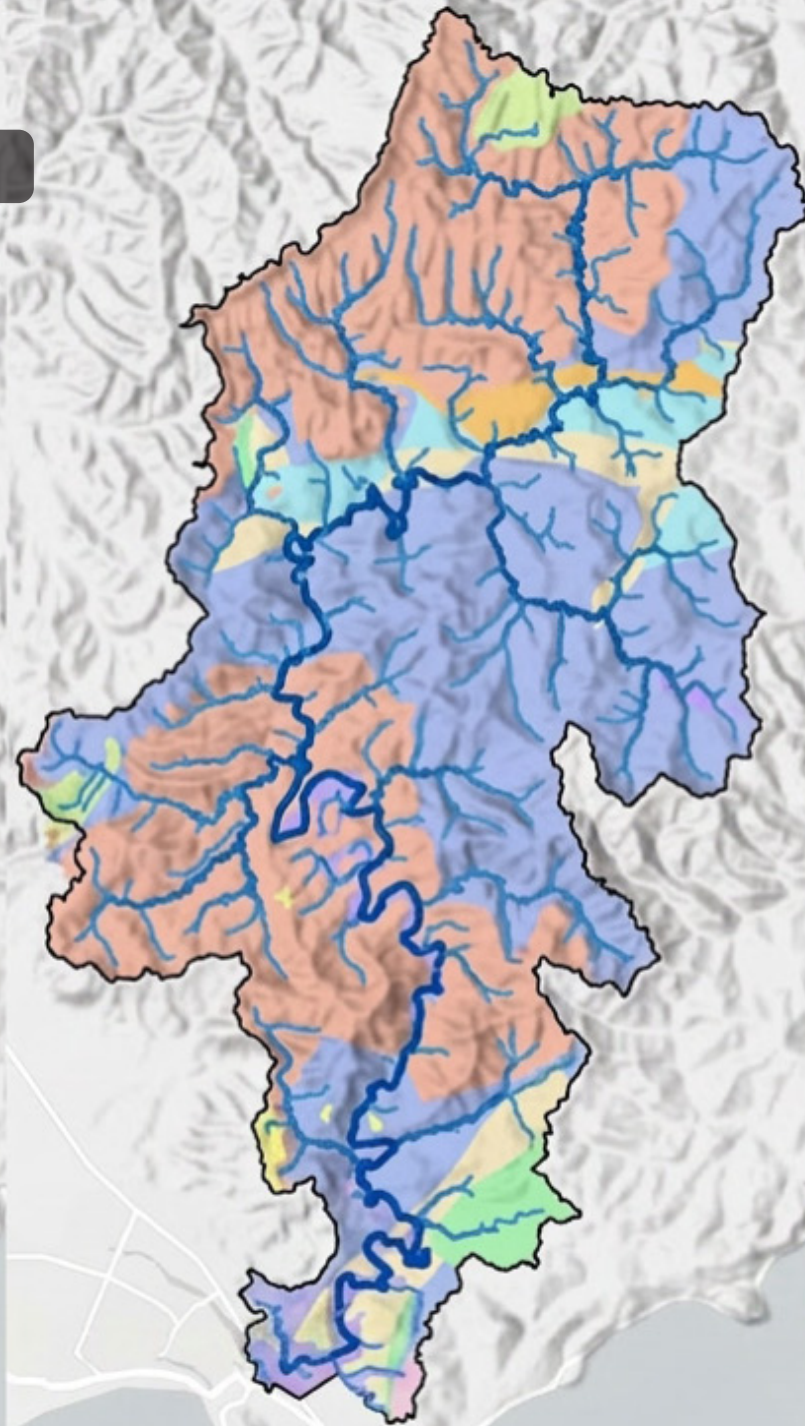
Compliance, tracked in real time

Map-based visualisation of stop-bank upgrade options
- supporting transparent consultation and informed
decision-making during public engagement.

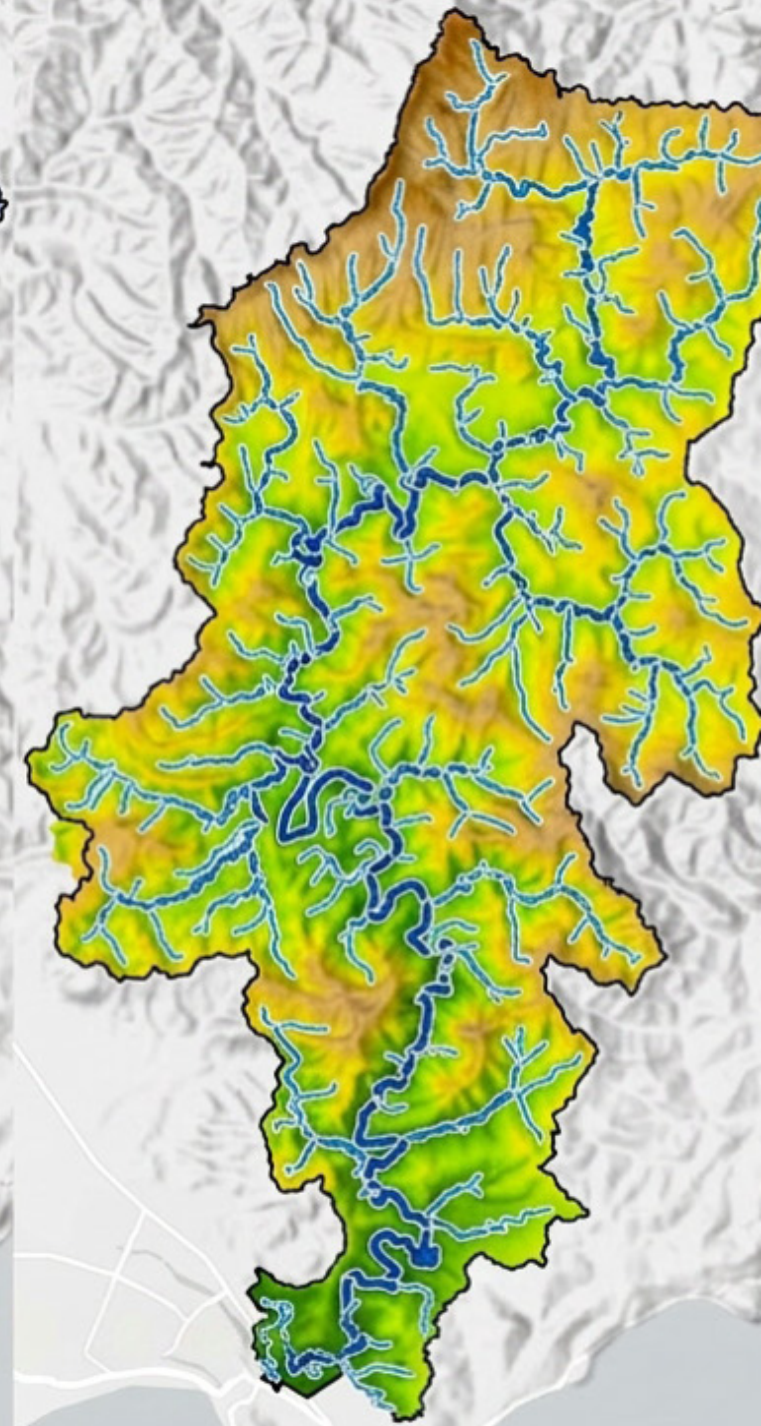
Catchment content: Waimatā



Landcover



Geology



Topography

Modelling nature - based solutions impact

Predicting impacts of catchment-scale interventions with geospatial machine-learning models to identify where nature-based solutions are most effective in reducing erosion and woody debris risks.

- Portfolio
- Documents
- Tasks & Calendar
- Transmittal
- DSMS/OSAP Overview
- Governance
- People
- DSMS Audits & Reviews
- Failure Modes
- Operation, Maintenance, Sur...
 - Geospatial Map
 - Devices
 - Data
 - Alerts
- Dam Safety Reviews
- Dam Safety Issues
- Regulatory Compliance
- Emergency Preparedness



Alerts

0 0 0

Instrument Status

3

Regulatory Compliance

3

Dam Classification Certificate: 01/05/2050 ●
 Dam Safety Assurance Programme: 10/11/2050 ●
 Annual Dam Compliance Certificate: 16/11/2020 ●

Dam Safety Issues

0

High Priority: 0 ●
 Medium Priority: 0 ●
 Low Priority: 0 ●

Tasks

1

You can find all tasks here.
 These include relevant tasks
 & key dates for each dam,
 and across the dams' portfolio.

Demtec Inspection Form - Morey Street West

WWTD L01 Flow Rate

Flow at WWTD L017

☐ Dry ☒ Flow

If possible please record a numerical reading.
 If you cannot do this please leave the
 measuring container size and time to fill
 questions blank.

Measuring Container Size (L) 3 Time to Fill (s) 60

Flow Rate : 0.05 L/s

Flow rate is within the acceptable range.

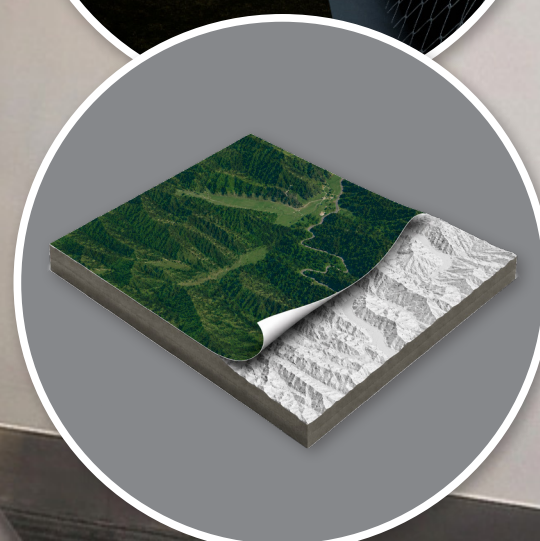
Comment:
 Low flow. Clear.

Observations:
 What is the condition of the apron rock lining?
 Is there evidence of scour?

6 of 8

Digital tools supporting safer, smarter asset management

Geostationary field capture and visualisation workflows developed as part of the Damtec platform help streamline inspections and improve access to critical dam safety information.



Experience the future before it's built

Combining engineering design, geospatial expertise, and custom development to create an immersive driving simulator that helps communities and stakeholders better understand the project, its benefits, and the future experience it will deliver.

How we support projects

We provide end-to-end geospatial services, supporting projects from early planning through to delivery, operation, and ongoing use. Our approach combines data, technology, and domain knowledge to deliver practical, fit-for-purpose solutions.

This includes:

Field Data Collection - Capture the right data, first time

Structured field data capture workflows that improve data quality, reduce rework, and create a reliable foundation for decision-making.

Spatial Data Analysis

Turn complex data into clear decisions. We uncover patterns, risks, and opportunities - so teams can act faster with confidence.

Imagery + LiDAR - See what others can't

High-resolution spatial data reveals terrain, change, and constraints - enabling better planning and design.

Interactive Maps - Put insights in everyone's hands

Live, interactive maps that allow teams and stakeholders to explore, understand, and act on project data.

Maps + Data Communication - Make complexity easy to understand

Clear, visual outputs that align teams, support engagement, and drive better decisions.

GeoBIM + 3D Scenes - Visualise the project before it's built

Integrated GIS and BIM models provide spatial context for planning, coordination, and risk reduction.

Data + Systems Support - Make your data work harder

Integrated systems and automated workflows that improve efficiency, consistency, and reliability.

Contact us

To find out more about how we can help you, **contact us at:**

geospatialsolutions@tonkintaylor.co.nz

Or visit our website
by **scanning the QR code below:**





Together we create + sustain a better world

www.tonkintaylor.com