Addressing climate change impacts on health service access in Aotearoa New Zealand

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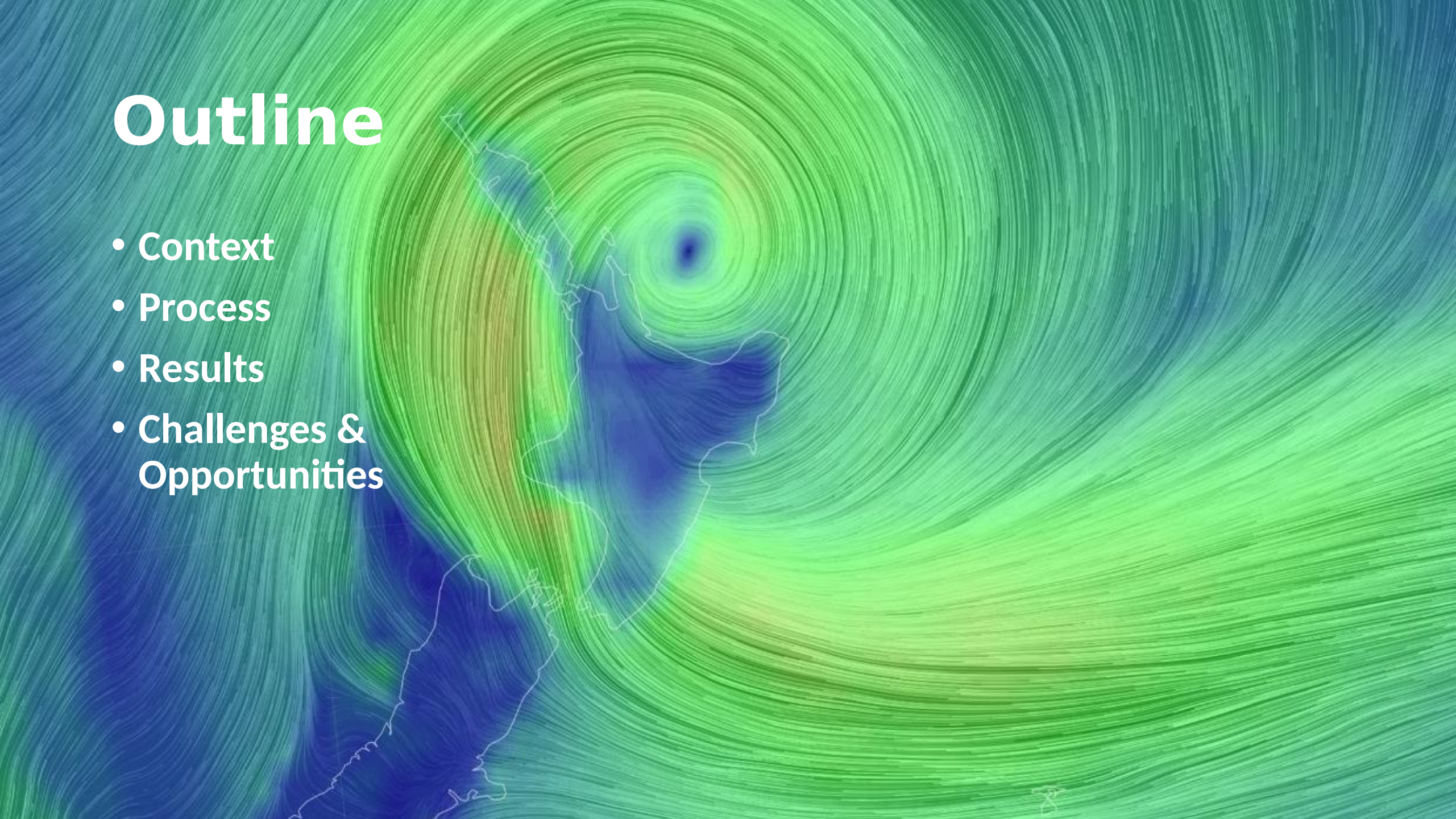
CARA Centre for Australian Research into Access

Outline

- Context
- Process
- Results
- Challenges & Opportunities



Cyclone Gabrielle *Feb 2022*

$3.18bn in insurance claims

11 Deaths due to the cyclone

6 Regional States of Emergency

700 houses in Govt buy out

Estimated total cost to NZ

30 sections of state highway closed

$14.5bn

2 months of raw sewage pumped into Napier ocean

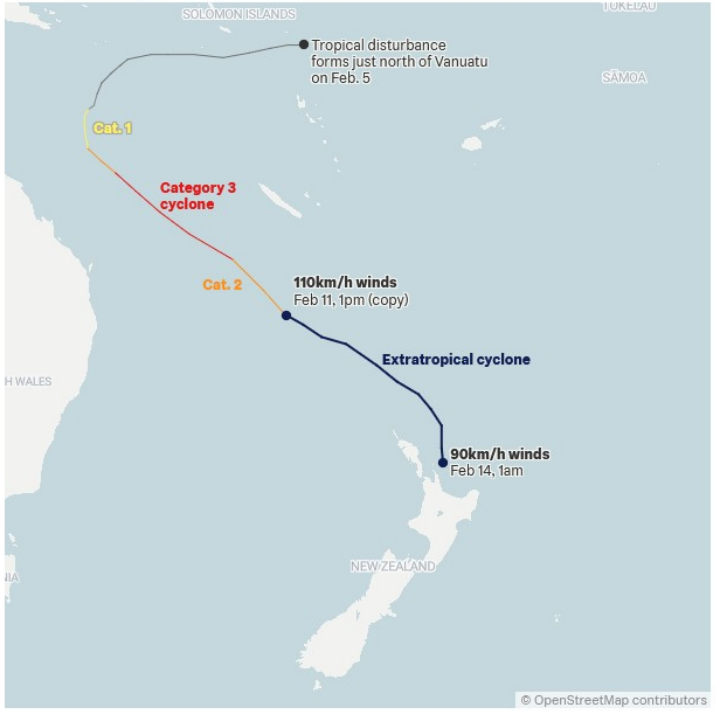
330,000 households lost power

2000 ACC injury claims

300 houses red-stickered

90% of mobile towers offline for 2 days in Gisborne

phcc



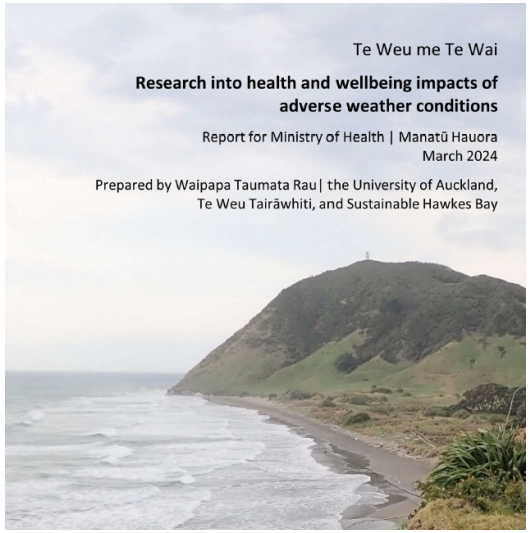
Source: Joint Typhoon Warning Center

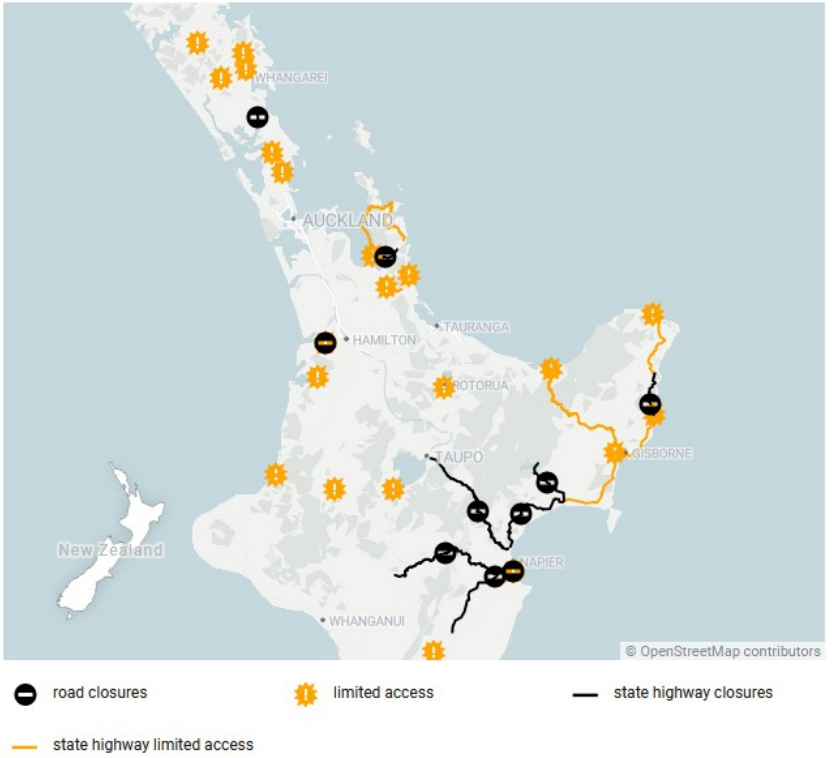
Impact on health

Increased ASH rates (“potentially preventable”)

Decline in service utilization

- Especially in rural & remote areas
- 24m immunization rates
- Cancer pharmaceuticals
- Maternity procedures
- Colonoscopy





Didn’t examine disruption in service *access*

Roading

NZ roads are difficult, smaller, windier, slower

Landscapes change

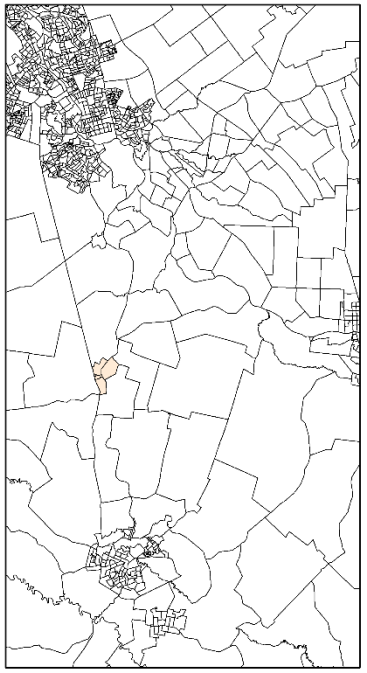
Rural access a major issue

Scale and boundary issues

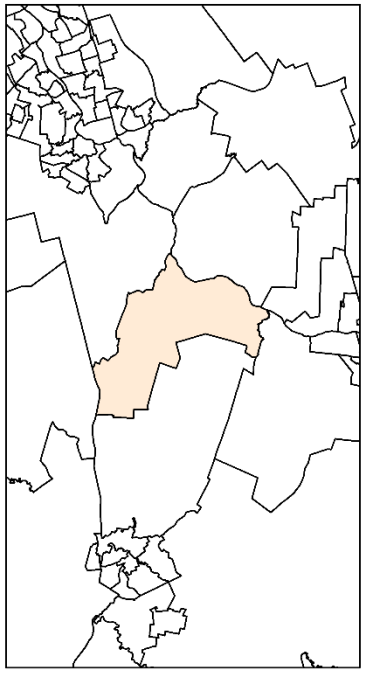
Non-alignment w health data

Address-level output for flexibility

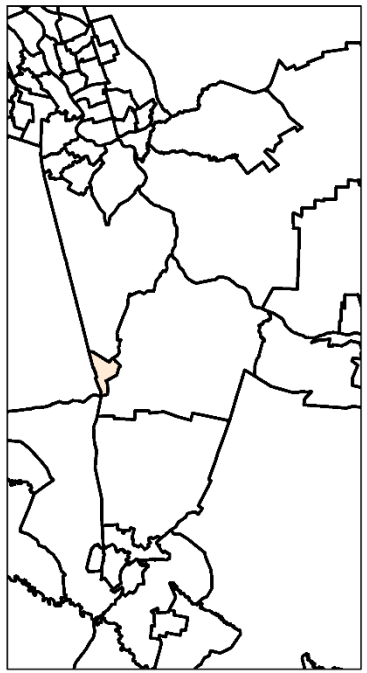
Statistical Area 1



Statistical Area 2



Domicile



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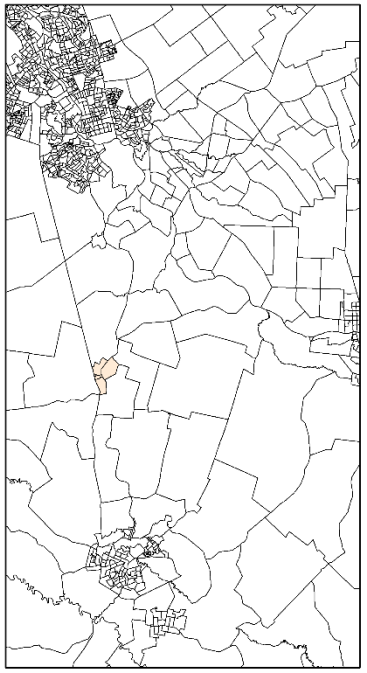

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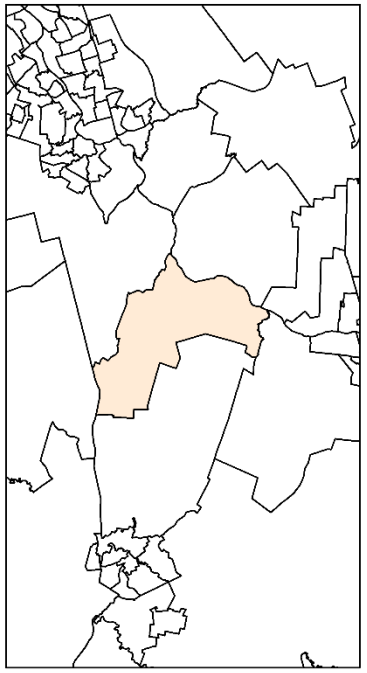

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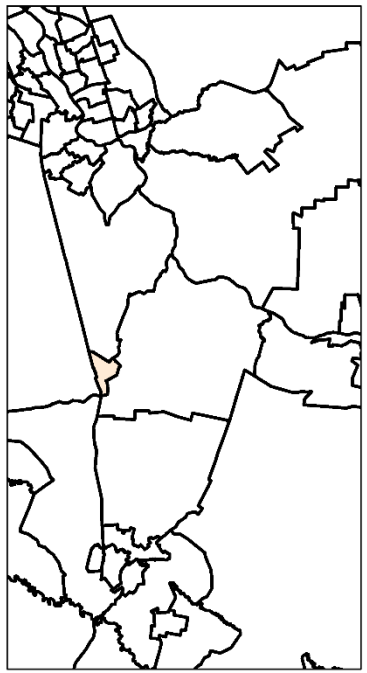

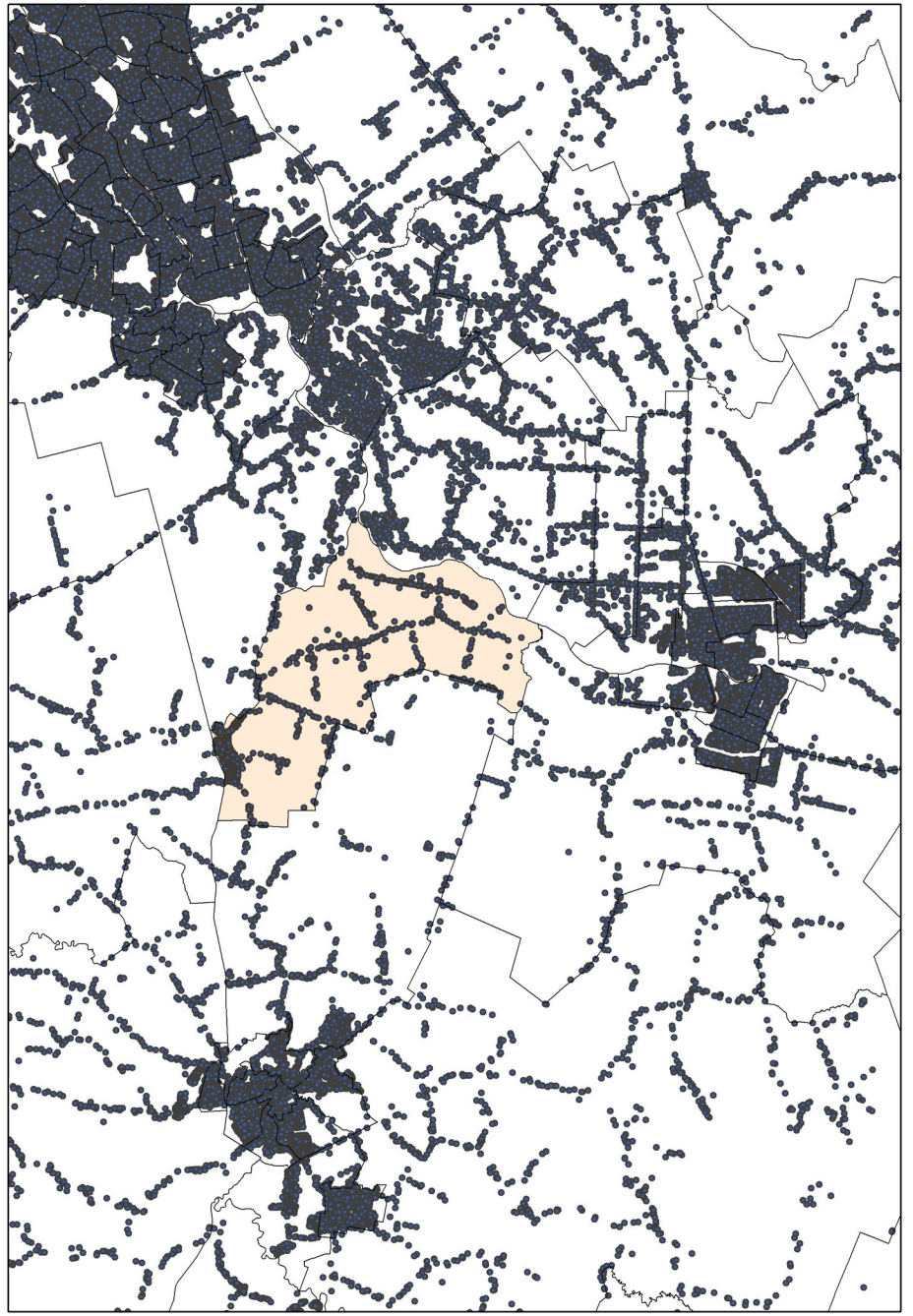

Research Aims

Develop a Proof-of-Concept to:

- Quickly estimate access at the address level
- Compare access to health services before and after cyclone Gabrielle

Process

- CARA is developing detailed and high-quality data sets that enable to analysis of accessibility to services
  - Detailed = address level (ABS Address Register)
  - High quality = Admin & Commercial Data (Government Registers & Precisely Ltd Road Network)
  - Quick = Python, Parquet and Pandana
- Adapting CARA to the NZ context: Proof of concept for the use of Open-Source Data
  - Still Detailed = address level (LINZ)
  - But Lower quality = OSM Data (Government Registers & OSM Road Network)
  - Still Quick = Python, Parquet and Pandana
- NZ Datasets & Issues
  - Open Street Map road network
  - Land Information NZ addresses (*n*=2.3million)
  - Ministry of Health facilities (GP clinics)
  - Road closures (NZ Transport Agency, Local Government)
- Code adapted to change the network to represent road closures & increased in

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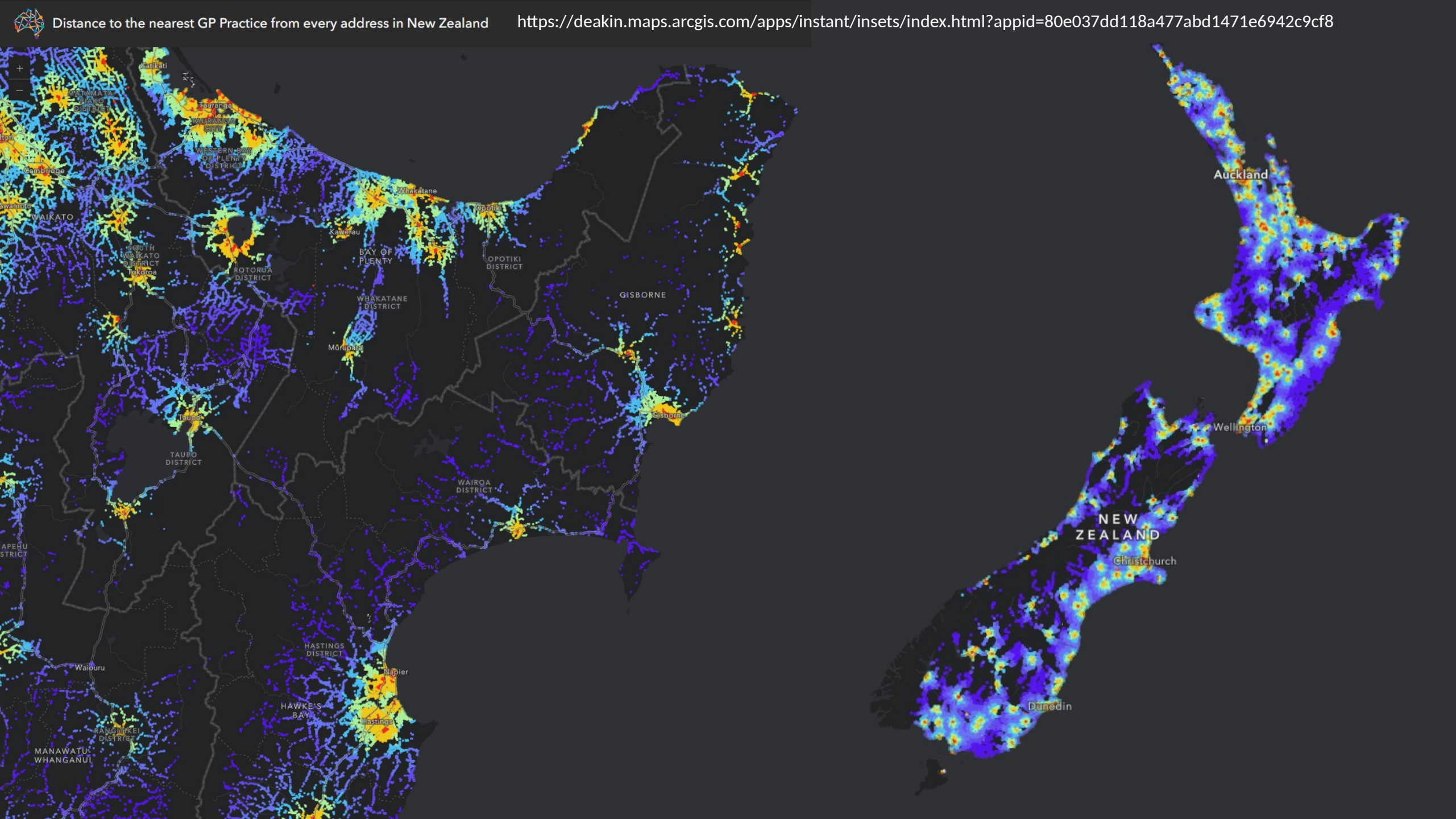
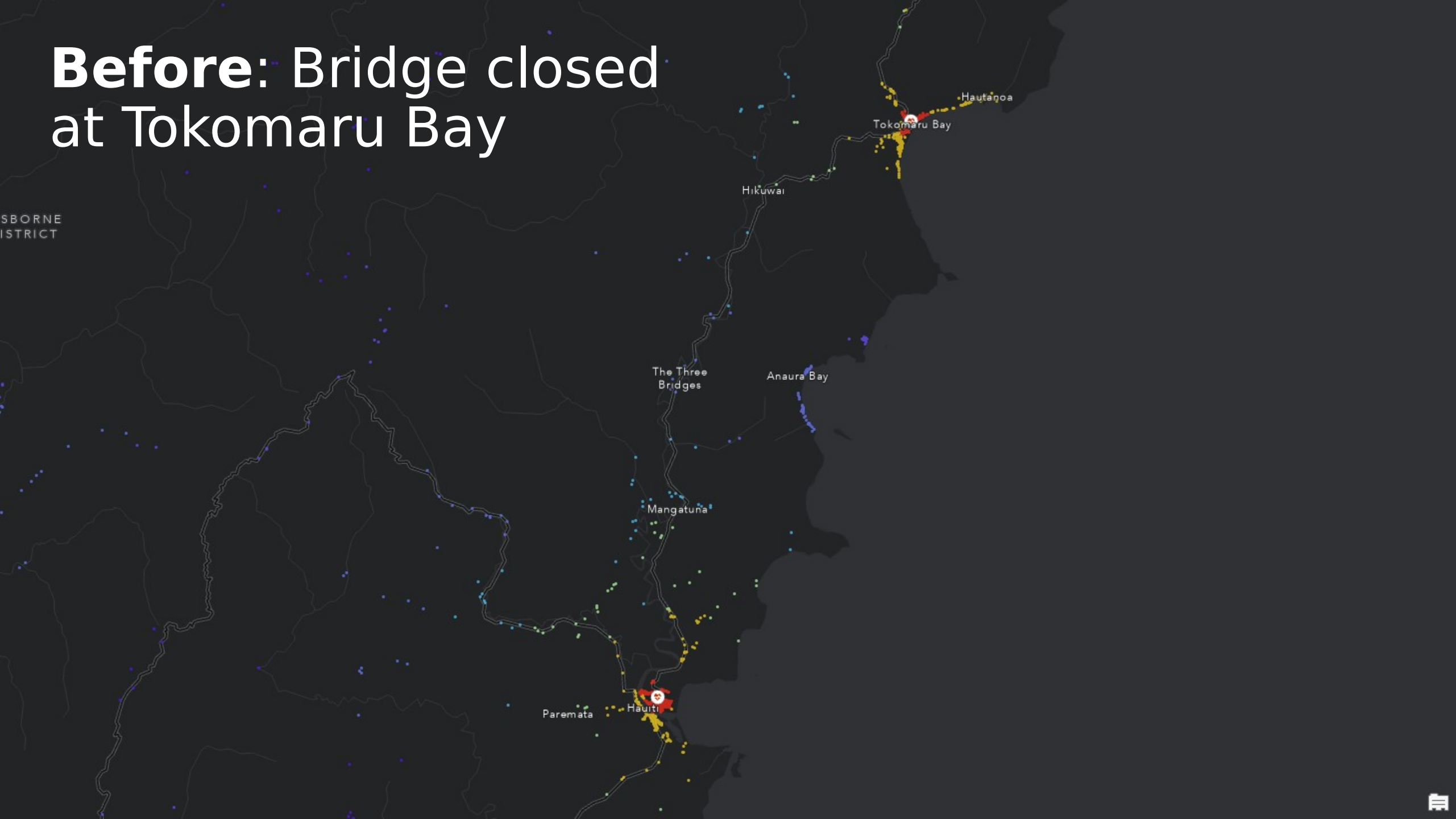
Distance to the nearest GP Practice from every address in New Zealand

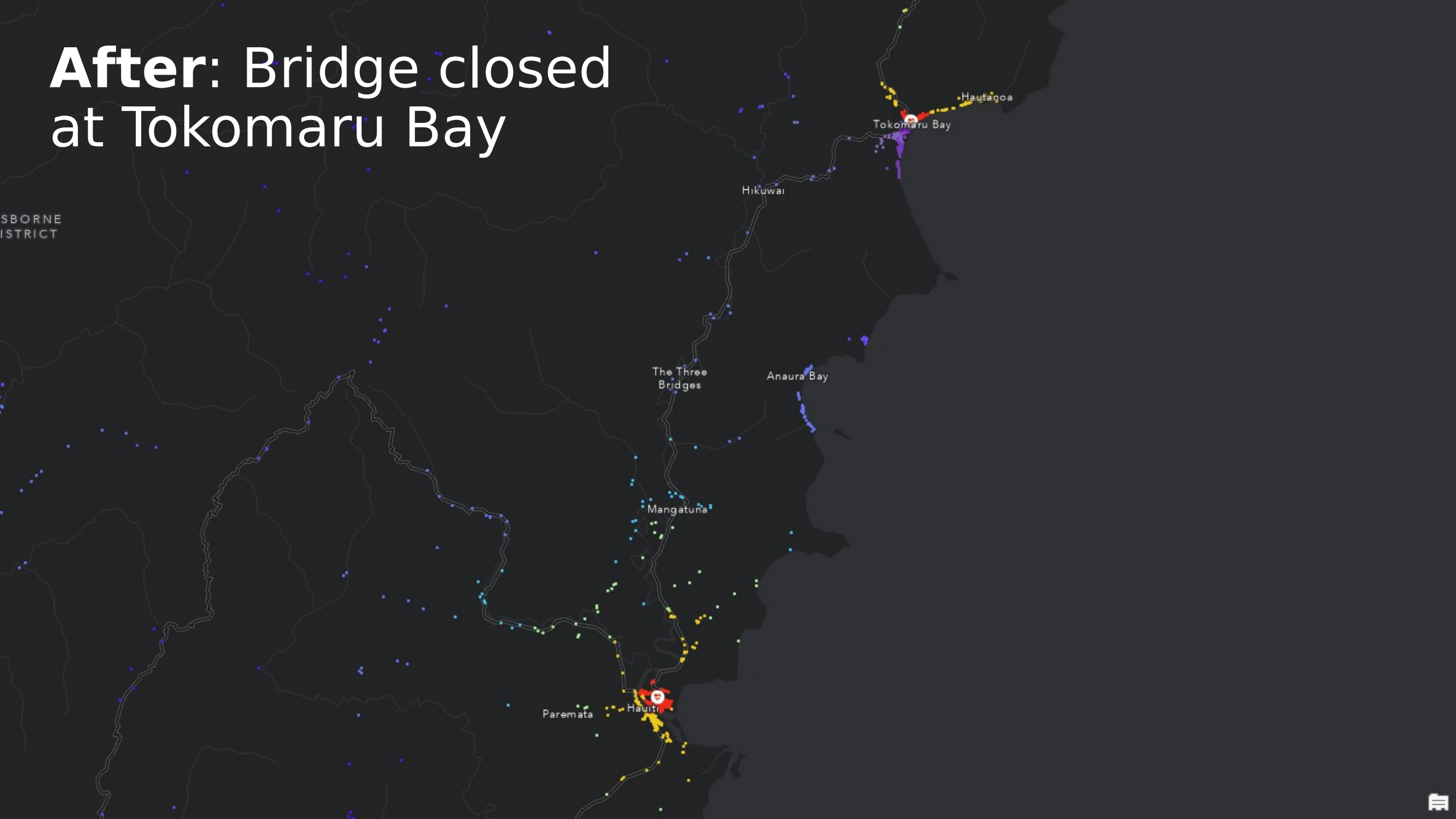
https://deakin.maps.arcgis.com/apps/instant/insets/index.html?appid=80e037dd118a477abd1471e6942c9cf8



Before: Bridge closed at Tokomaru Bay



After: Bridge closed at Tokomaru Bay



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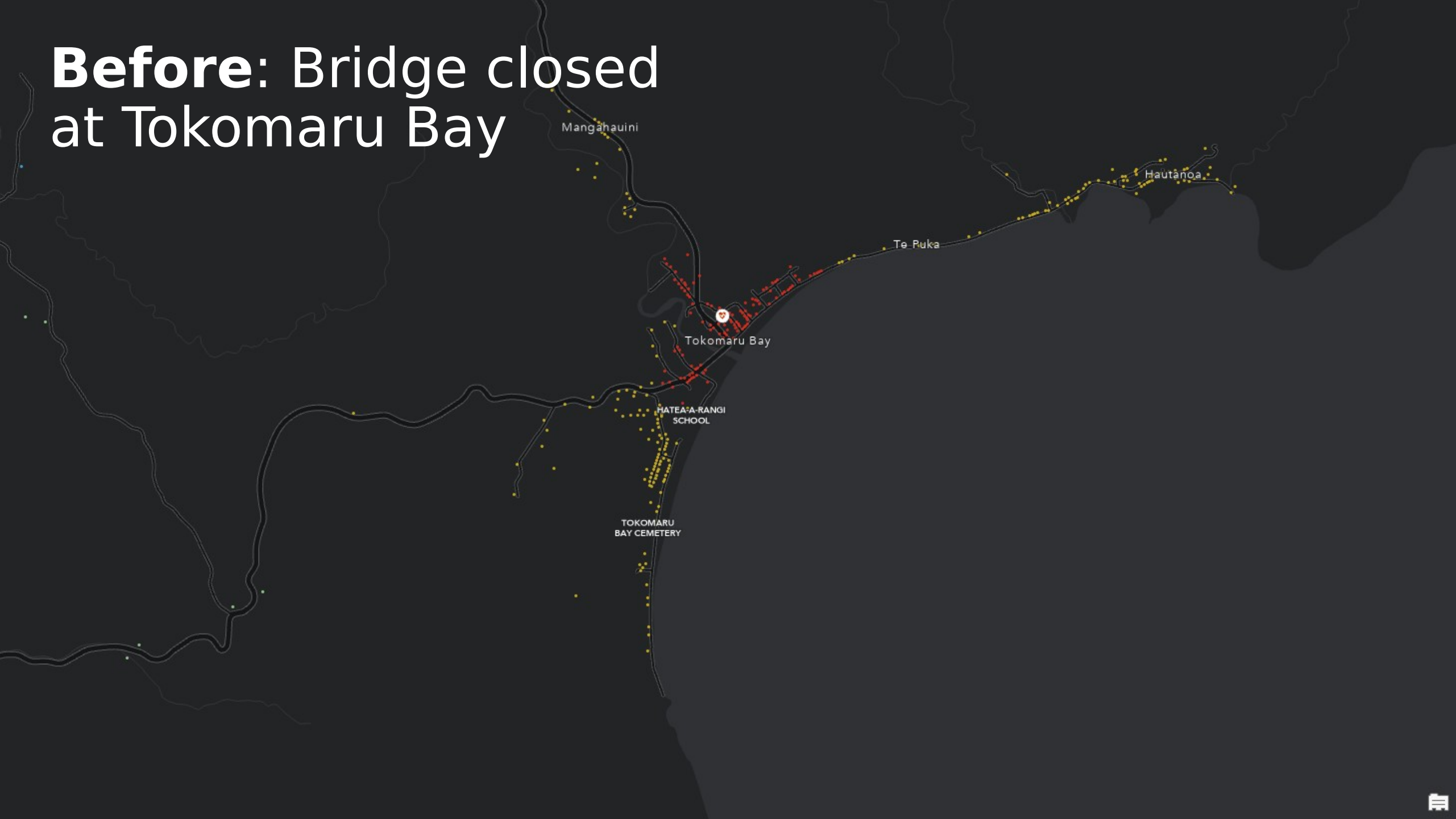

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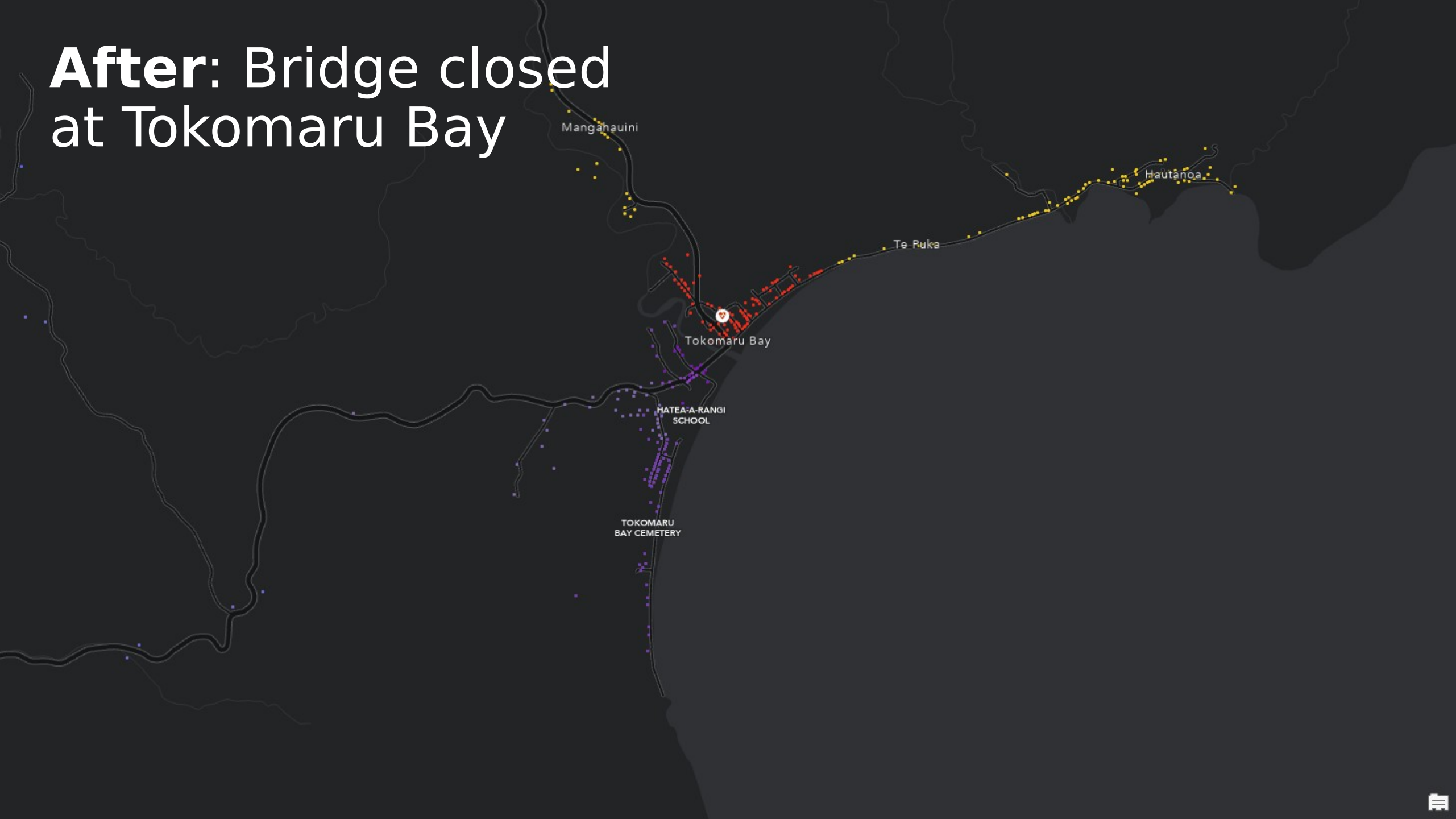

Challenges

Data

- Quality (road network changes daily!)
- Lack of National integration
- Not regularly updated in a coordinated way
- Issues for both road network and health services

Institutions

- Slow
- Cuts

Privacy & Confidentiality implications?

Emergency warning system work halted by public sector cuts

10:12 am today

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Phil Pennington, Reporter
@pjppenn phil.pennington@rnz.co.nz

A system allowing everyone to quickly share the same information was needed during the response to Cyclone Gabrielle. Photo: Nathan McKinnon

Public sector cuts have stopped work on a half-built emergency warning system, similar to what Cyclone Gabrielle reviews say the country urgently needs.

Inquiries into last year's lethal storms showed people were let down by lack of any system to allow everyone to quickly share the same, best information.

RNZ can reveal that Land Information NZ (LINZ) has built most of the datasets of maps and risks already - but has now dropped a project to find a way to easily share access to them in a disaster.

The work on building joining-up technology began in 2021, but was never properly funded from the start.

Now LINZ has opted to drop work on the Common Operating Datasets for Emergency Management (CODEM).

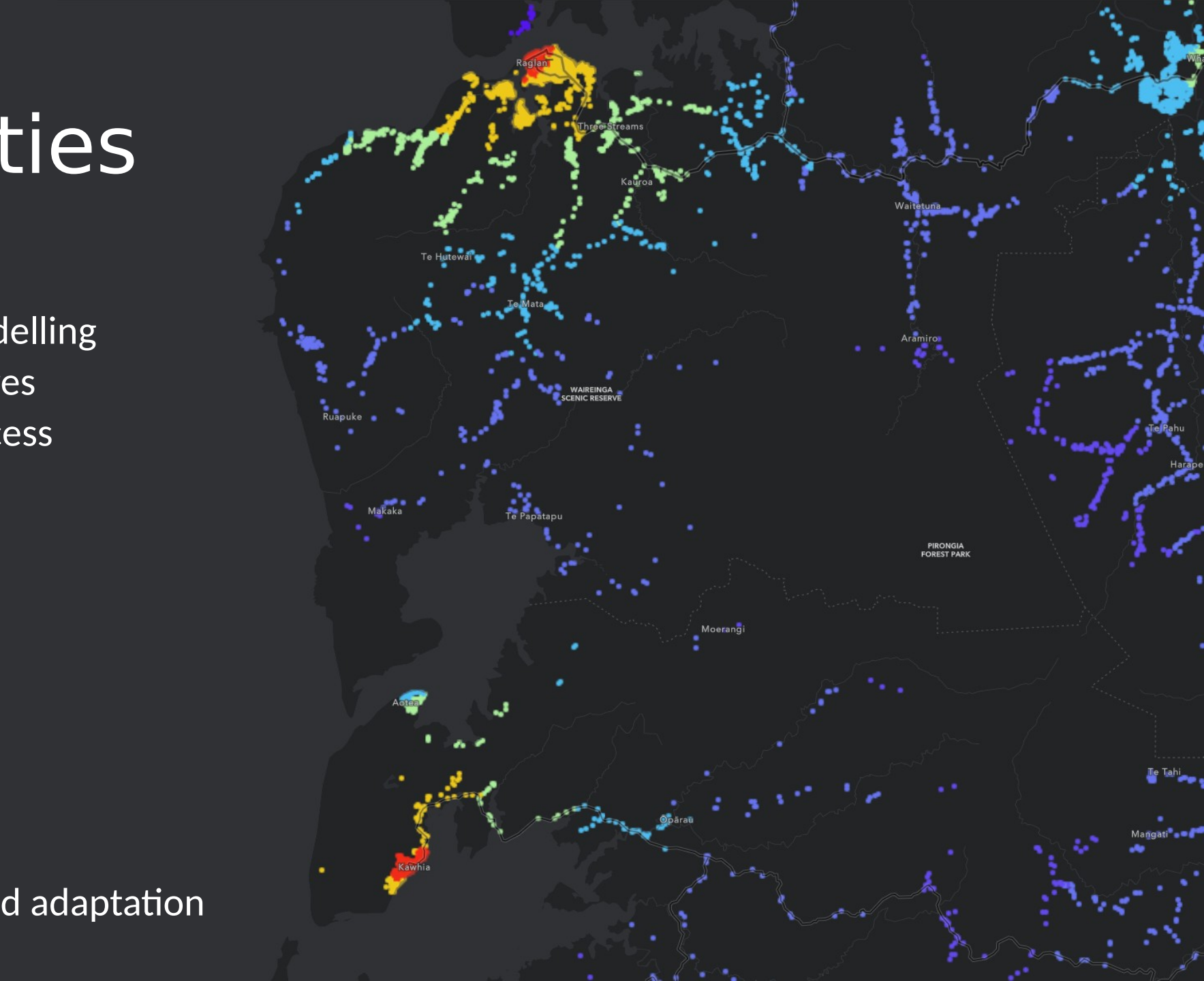
Opportunities

Rapidly estimate access:

- Simulation & scenario modelling
- "Live" accessibility measures
- Longitudinal studies of access
- Monitor policy impacts

Place-based approaches

- Bespoke geographies

Administrative linking

- Emergency response
- Health system planning and adaptation