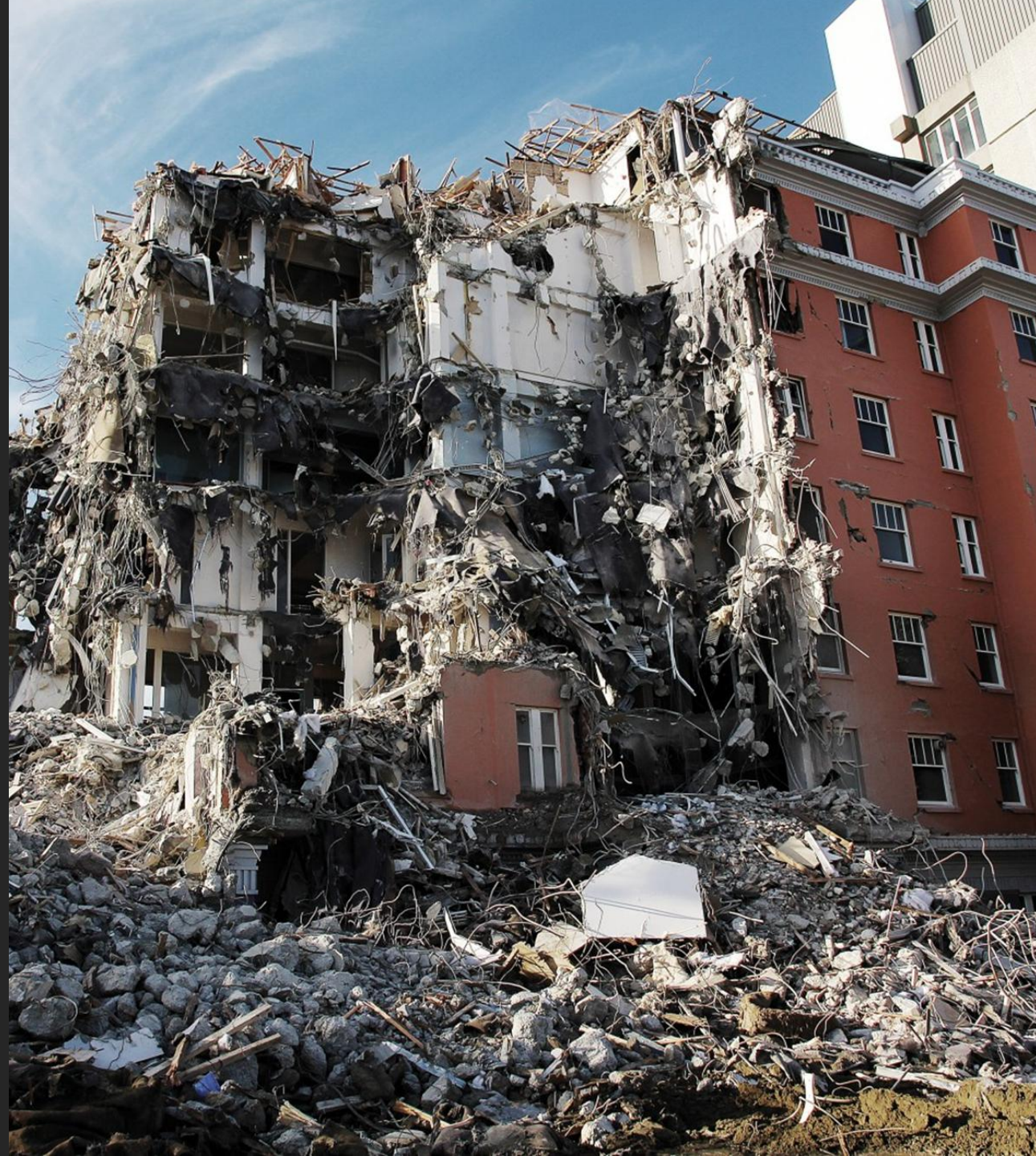
The Potential for Disaster Waste and Debris in Canterbury



When the next big disaster hits, where are we going to put all the waste?

The purpose of estimating volumes:

- To help Identify and establish a list of potential management and disposal locations across the Canterbury region to use following a disaster event.

- To support the development of disaster planning.

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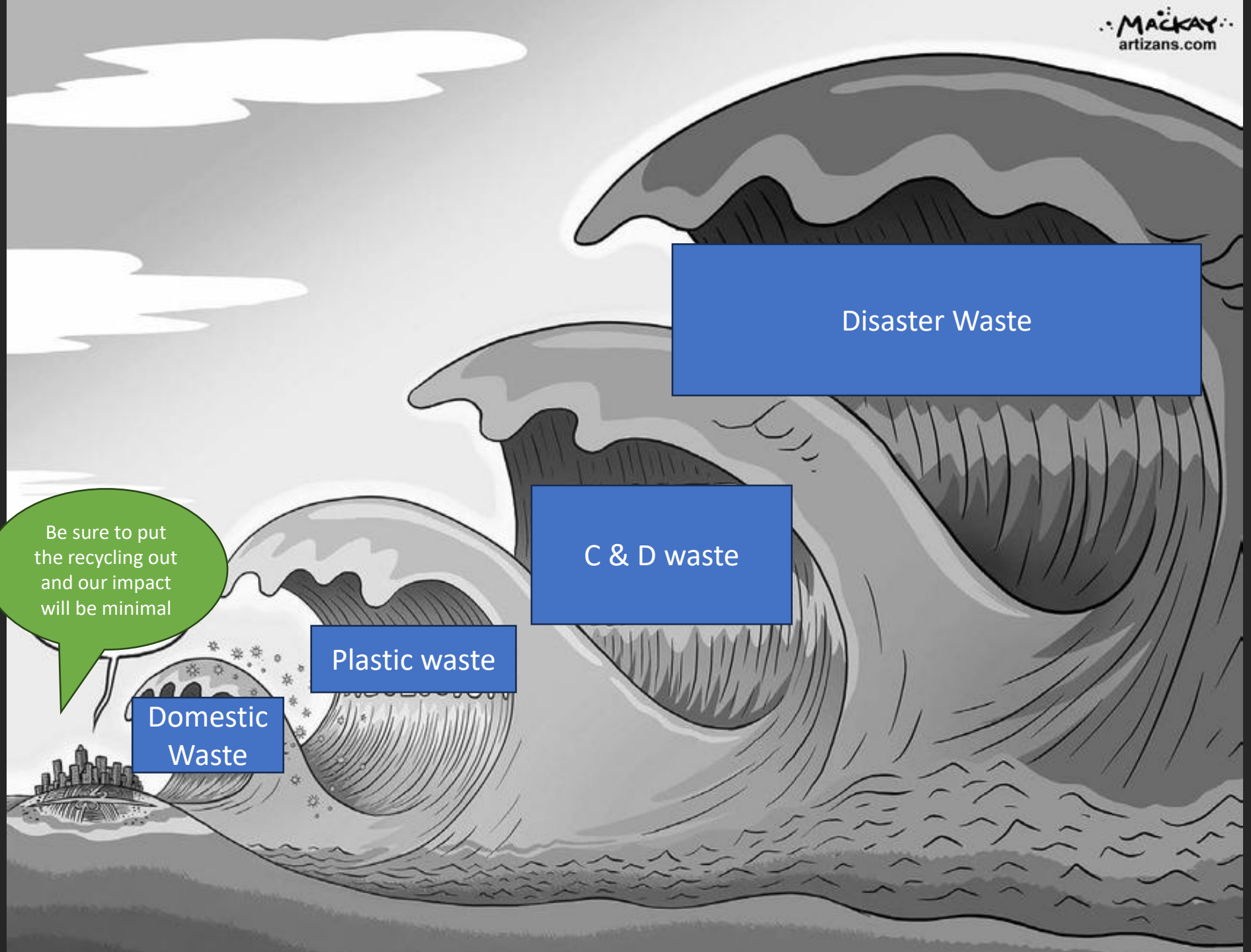
MACKAY
artizans.com
Disaster Waste
C & D waste
Plastic waste
Domestic Waste
Be sure to put the recycling out and our impact will be minimal

Why?

- To avoid putting waste and debris in poorly chosen locations in the haste to clean up following a disaster.

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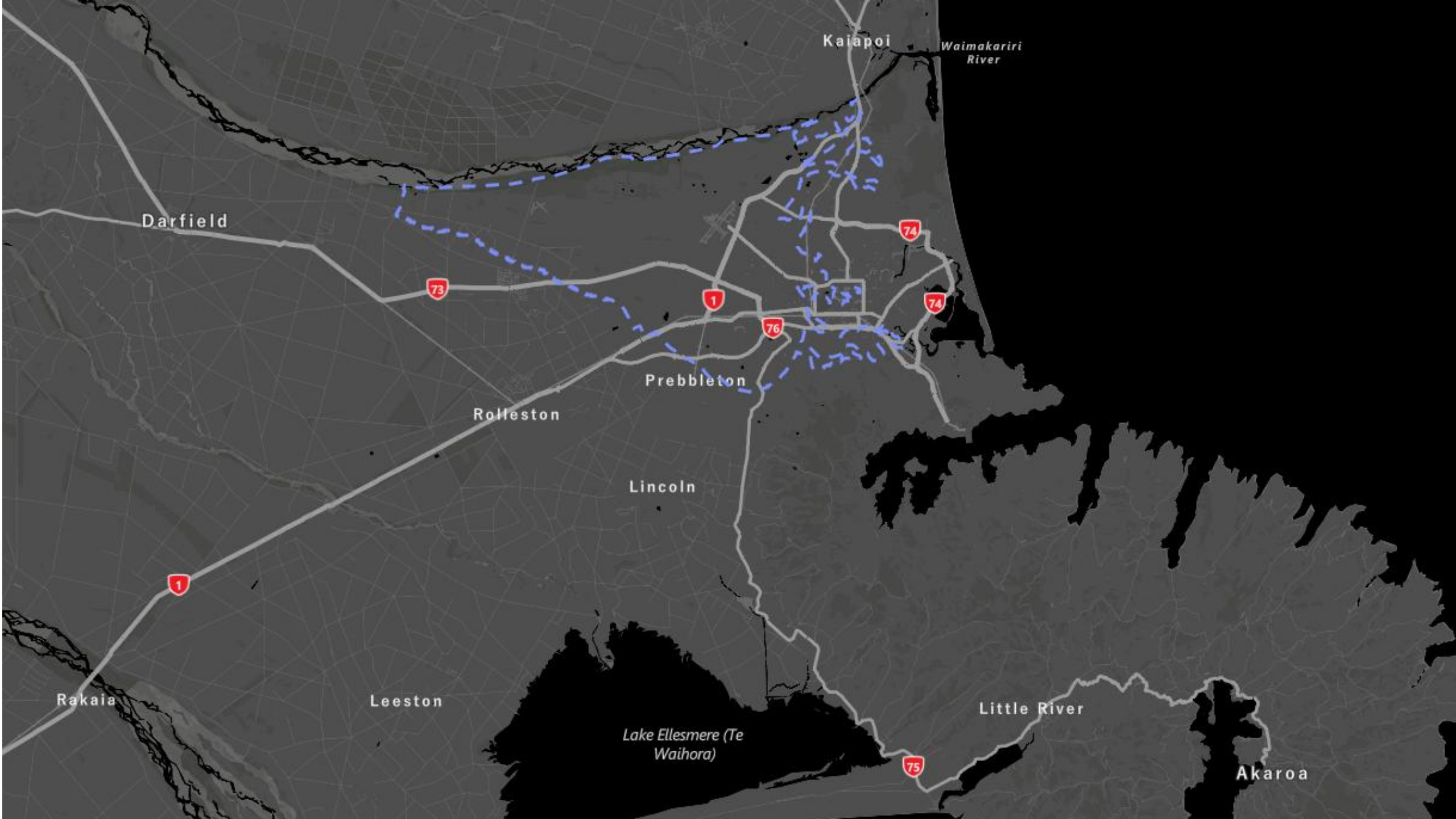
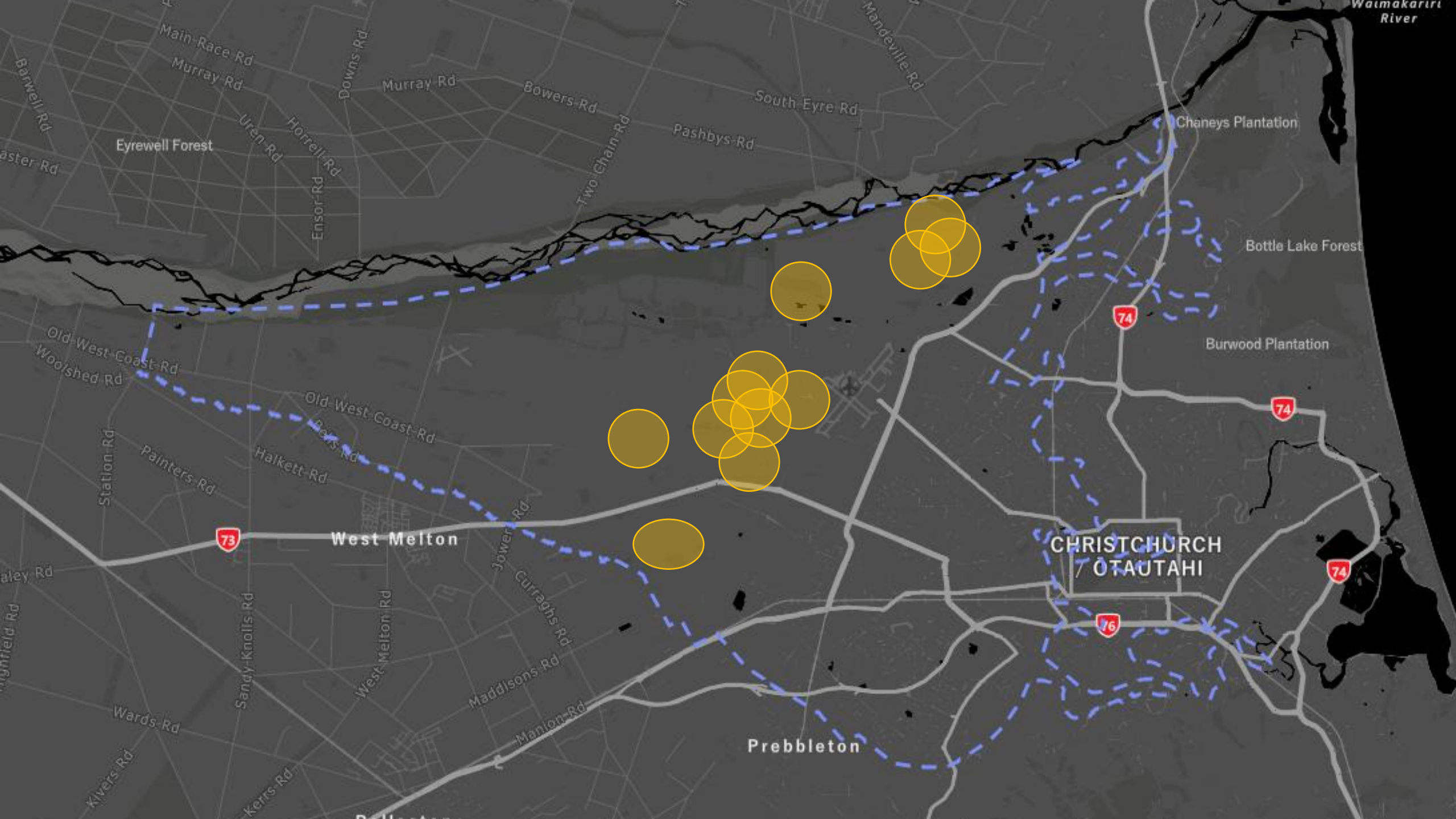
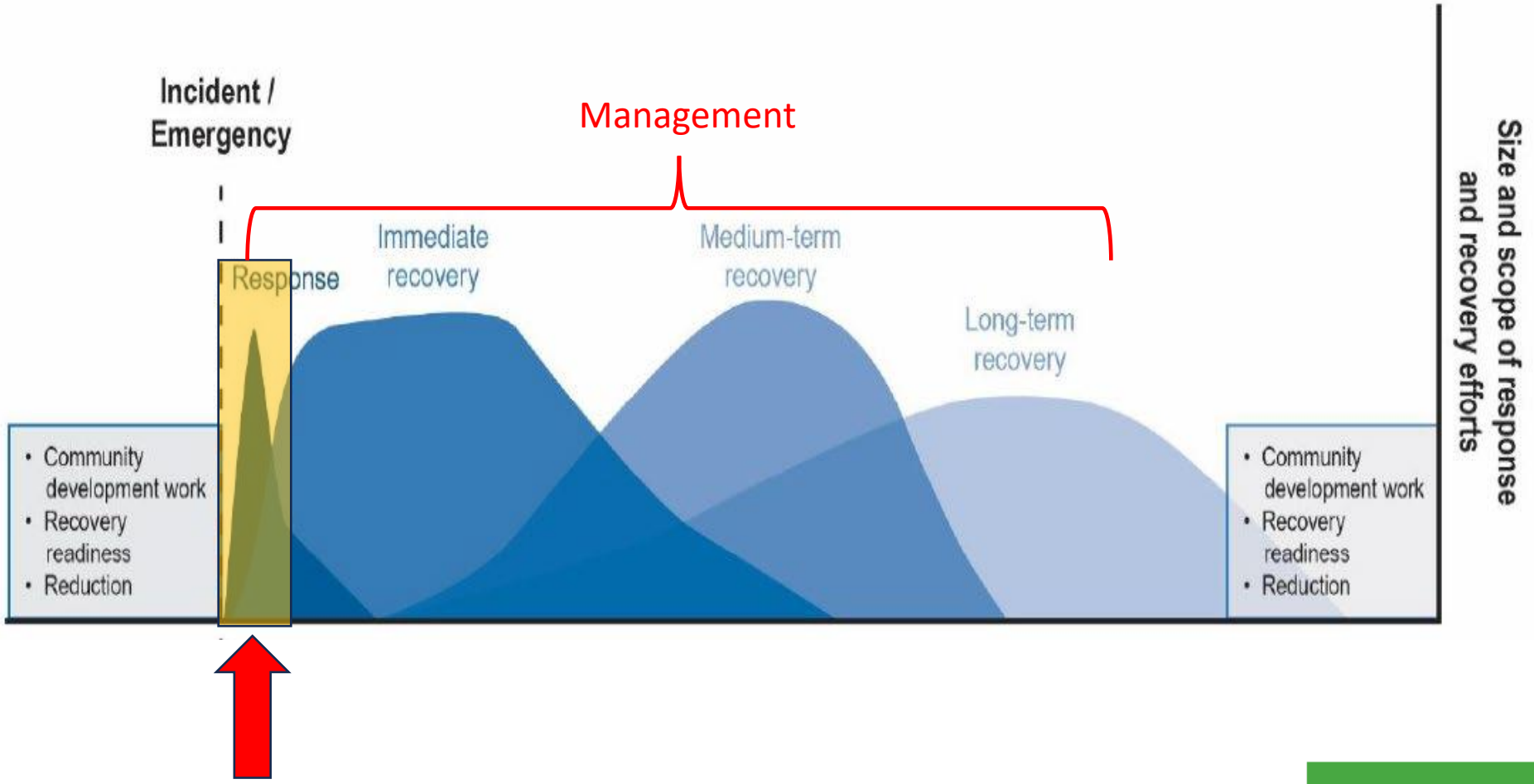
West Coast rubbish to end up at bottom of 4km deep ocean canyon, impacts felt for generations


Kaiapoi
Waimakariri River
Darfield
73
1
74
74
76
Prebbleton
Rolleston
Lincoln
1
Rakaia
Leeston
Lake Ellesmere (Te Waihora)
Little River
75
Akaroa


Waimakariri River
Eyrewell Forest
Chaneys Plantation
Bottle Lake Forest
Burwood Plantation
West Melton
CHRISTCHURCH / ŌTAUTAHI
Prebbleton
Main Race Rd
Murray Rd
Downs Rd
Mandeville Rd
Barwell Rd
Uren Rd
Horrell Rd
Ensor Rd
Bowers Rd
South Eyre Rd
Two Chain Rd
Pashbys Rd
Old West Coast Rd
Woolshed Rd
Boys Rd
Halkett Rd
Painters Rd
Station Rd
Jowers Rd
Curraghs Rd
Sandy Knolls Rd
West Melton Rd
Maddisons Rd
Manion Rd
Wards Rd
Kivers Rd
Kerrs Rd
73
74
76



Planning starts here

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Project plan:

Estimate volumes of disaster waste and debris . (University of Canterbury) – this presentation.

Next steps:

- District or isolated ‘Islands’ workshops
- Identifying potential management and disposal locations.


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The Potential for Disaster Waste and Debris in Canterbury

Connor Wilson, Heather Craig - *University of Canterbury*
Jack Grinsted - *Environment Canterbury*
Richard Mowll - *Richard Mowll Consulting Ltd*
Richard Ball, Gavin Treadgold - *Canterbury CDEM*

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What is Disaster Waste?

- Debris created from a natural hazard
- E.g.
  - Putrescible (food)
  - Clean fill
  - Liquefaction
  - Recyclable materials
  - Construction and Demolition (C&D)
  - Hazardous/sensitive waste
  - Mixed waste (from tsunami or flood)

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2010/11 Christchurch Earthquakes Waste

8.75 million tonnes of mixed earthquake waste, mainly C & D waste

Burwood Resource Recovery Park (BRRP) and landfill sites

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Cyclone Gabrielle Waste/Debris

- **2.7 million** tonnes of mixed flood waste
- Over **3 million** m^3 of silt and woody debris

Silt Recovery Taskforce
~2.5 million m^3 of silt collected

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Overview of Work

Estimating disaster waste in Canterbury for three disasters (Earthquake, Tsunami, Flood)

Adapting a waste estimate model used in Wellington

Future work: Using estimates to inform disposal through workshops

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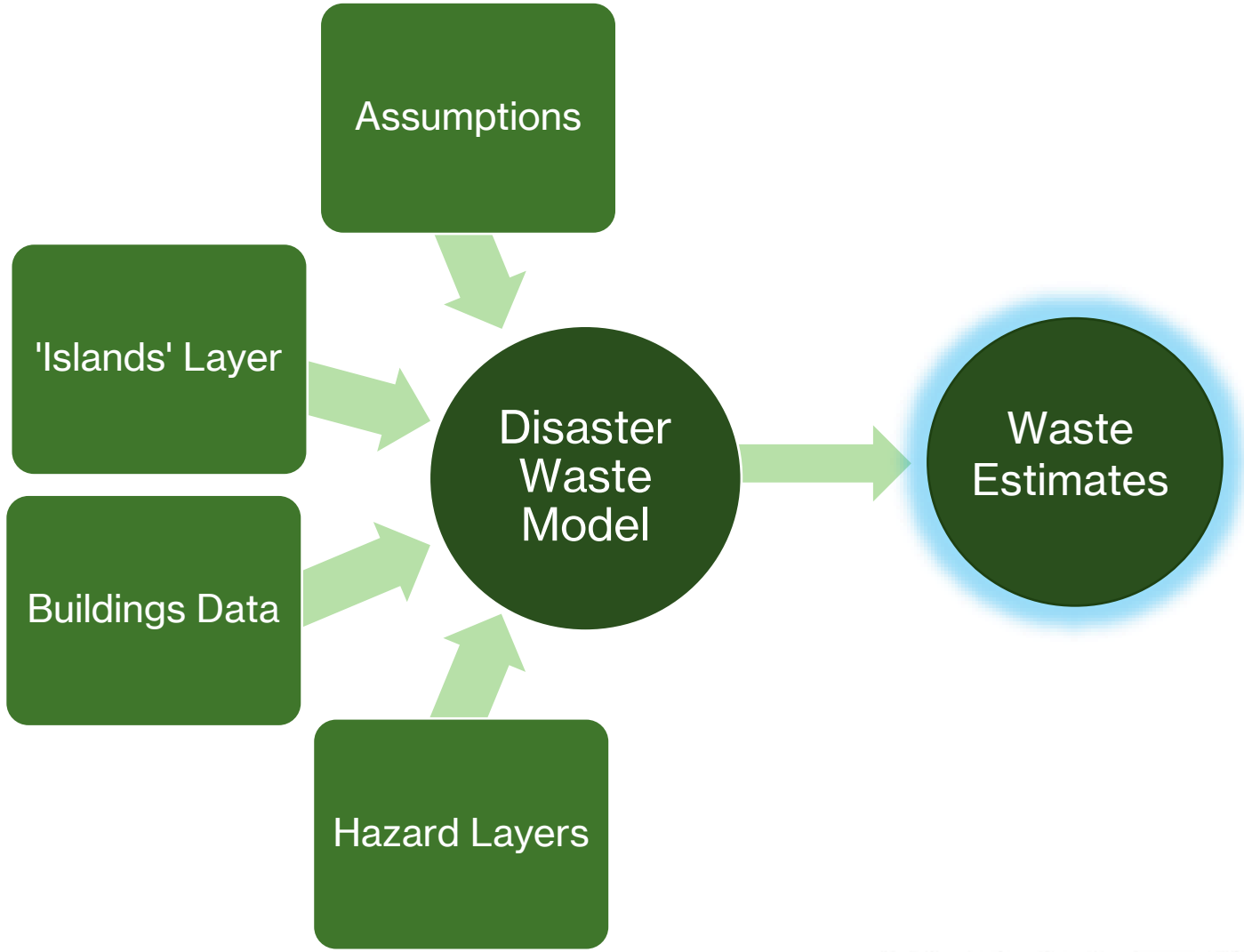
Methods



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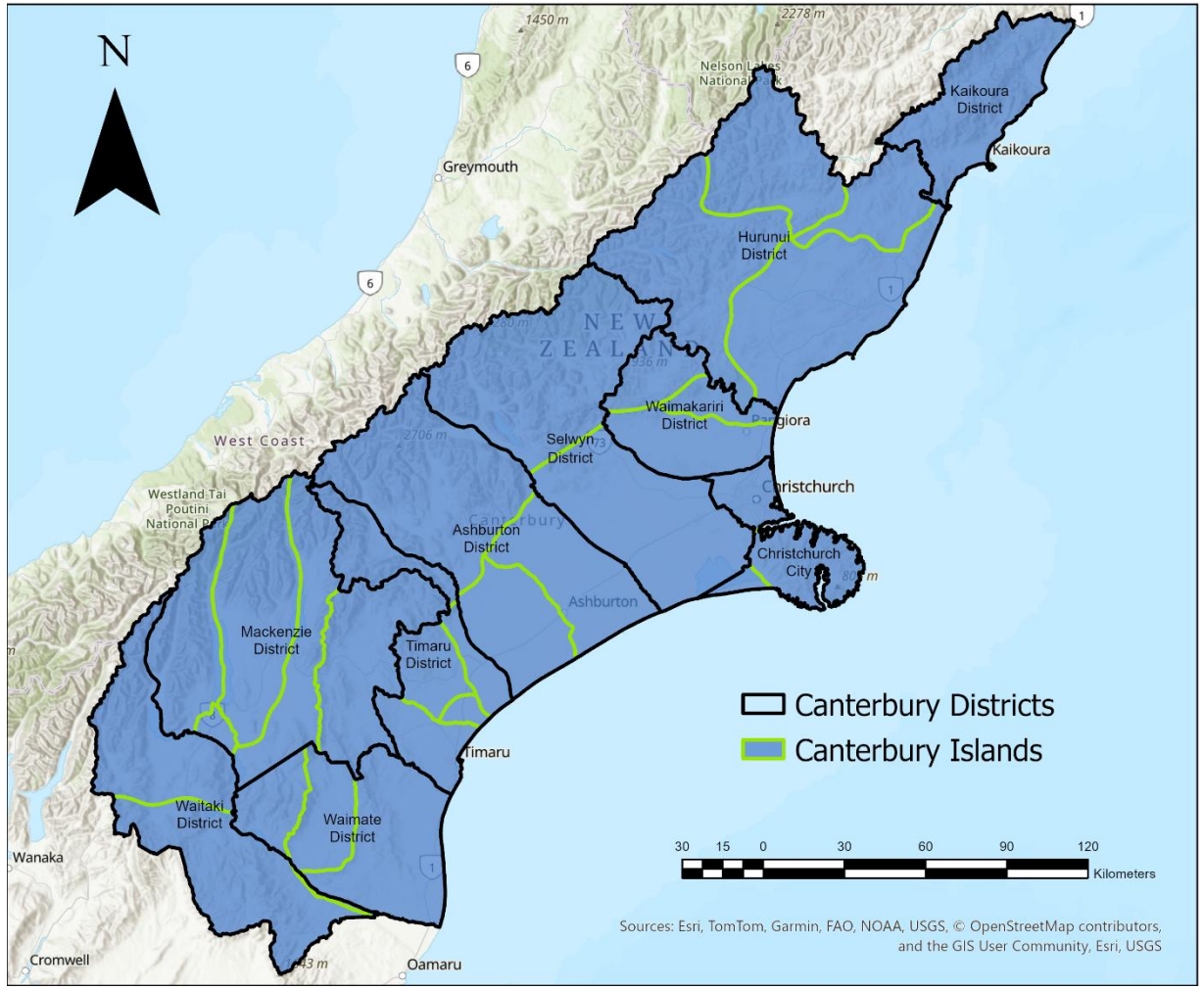
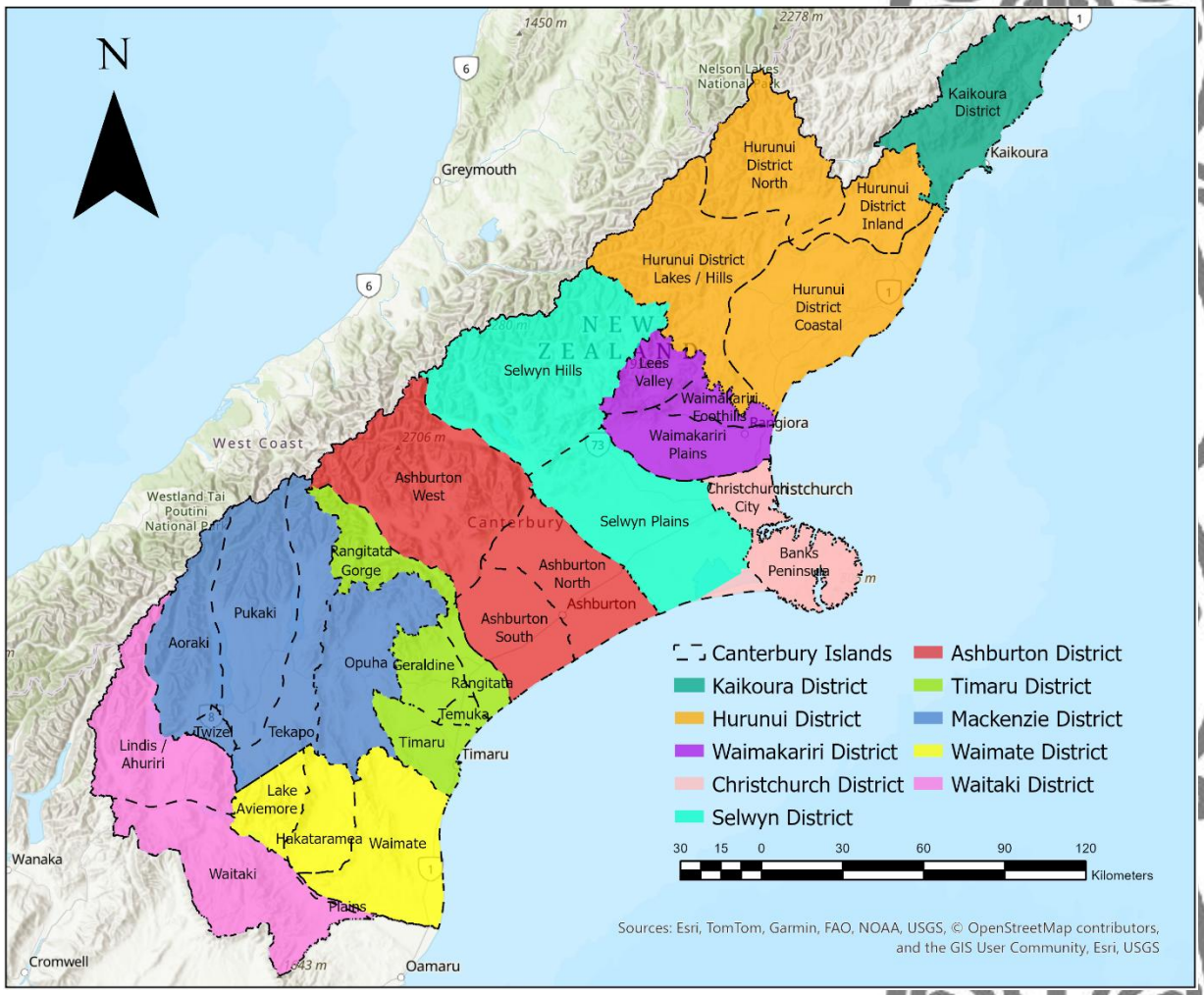
Canterbury ‘Islands’





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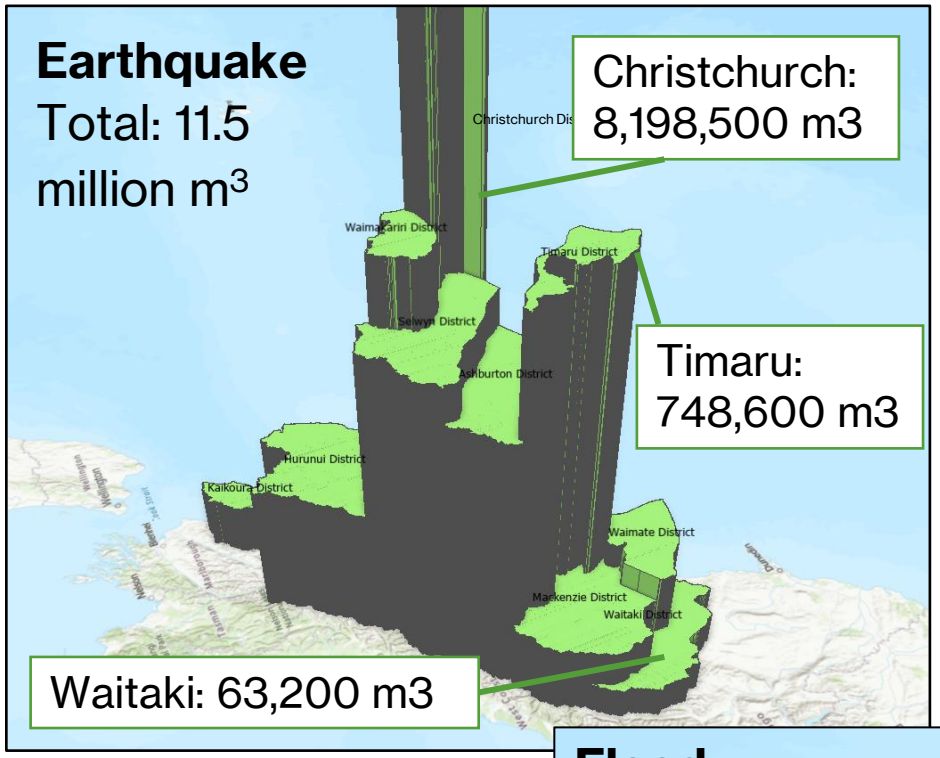
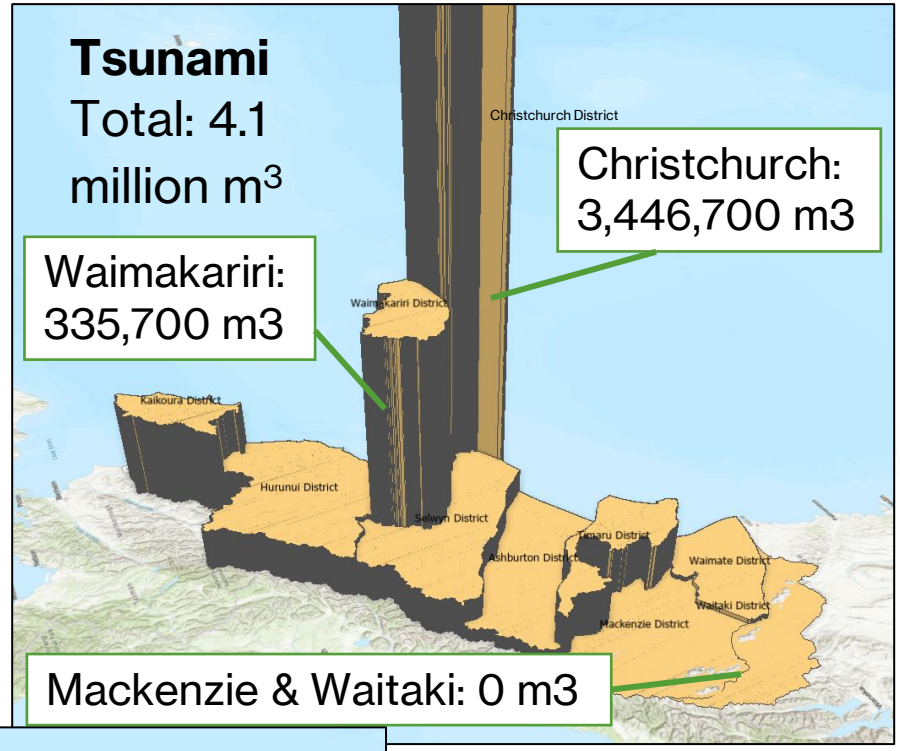
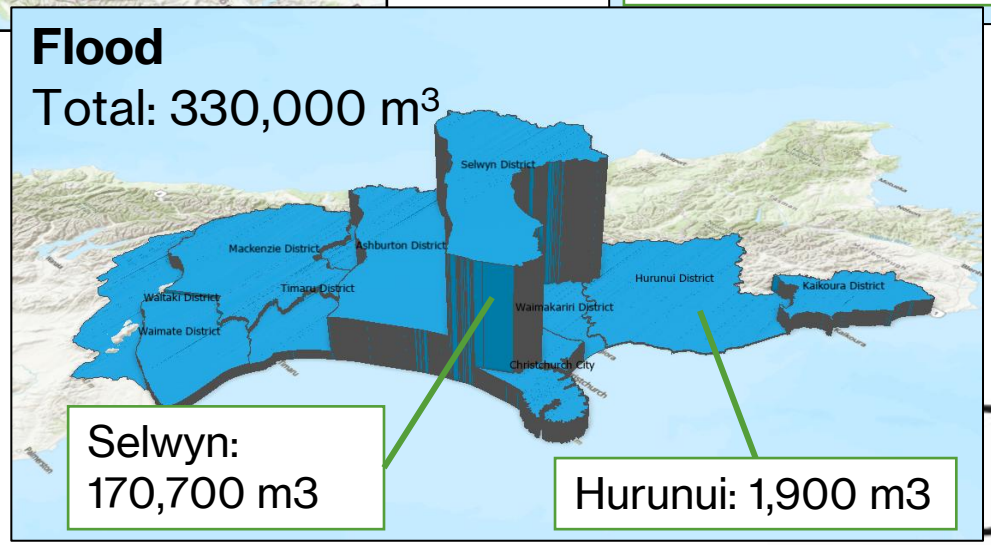
Limitations / Model Assumptions

- Based on WCC Model – high uncertainty
- Estimates rounded
- Hazard scenarios based on available mapping
- Flood estimates underrepresented

Disaster Waste Estimates for Canterbury







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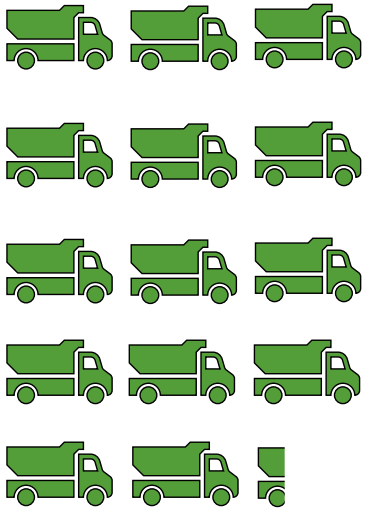
Total Number of Trucks Needed for the Canterbury Region

5,000 Trucks

- Earthquake (199,160)

- Tsunami (71,220)



- Flood (5,660)

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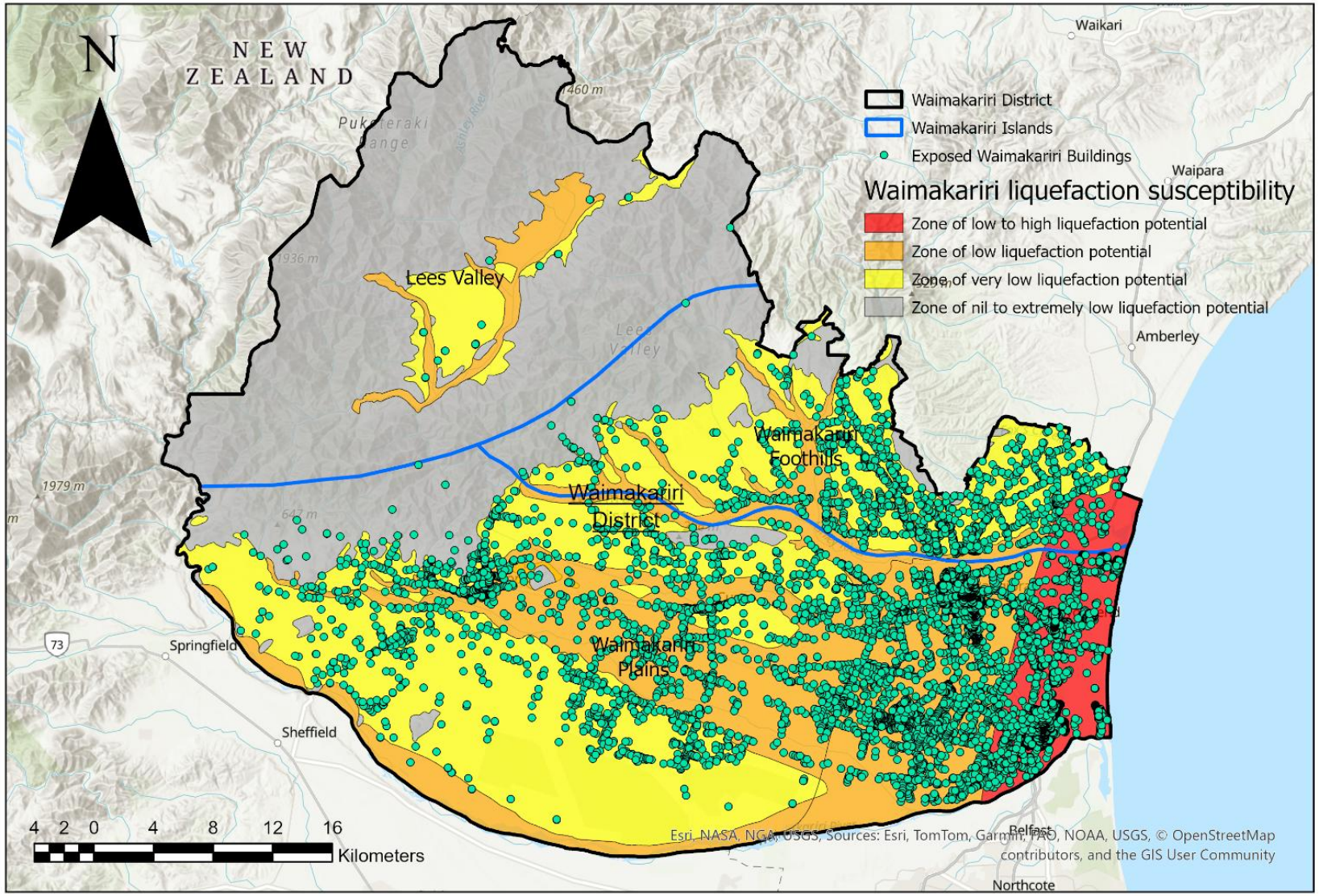
Buildings Potentially Exposed to Liquefaction (Earthquake) in Waimakariri



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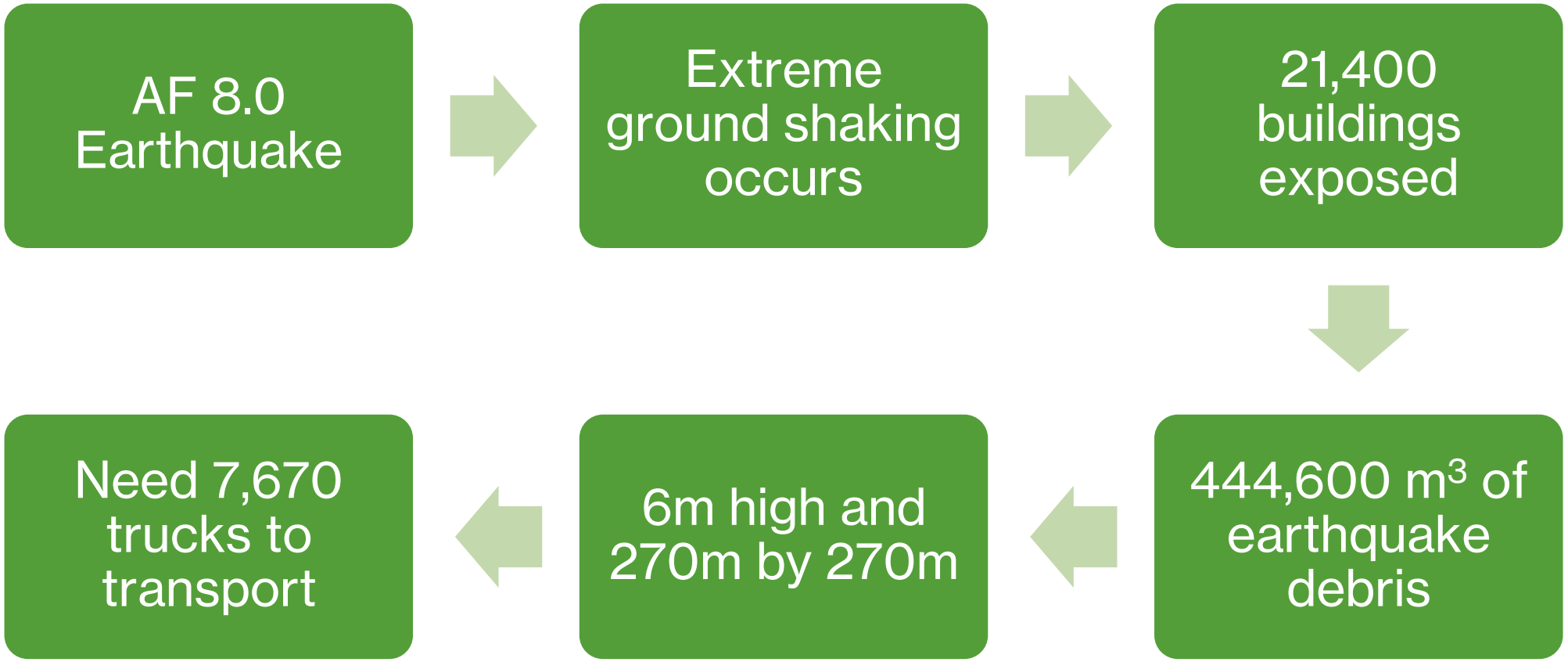
Example: Alpine Fault Earthquake (Building Damage in Waimakariri)



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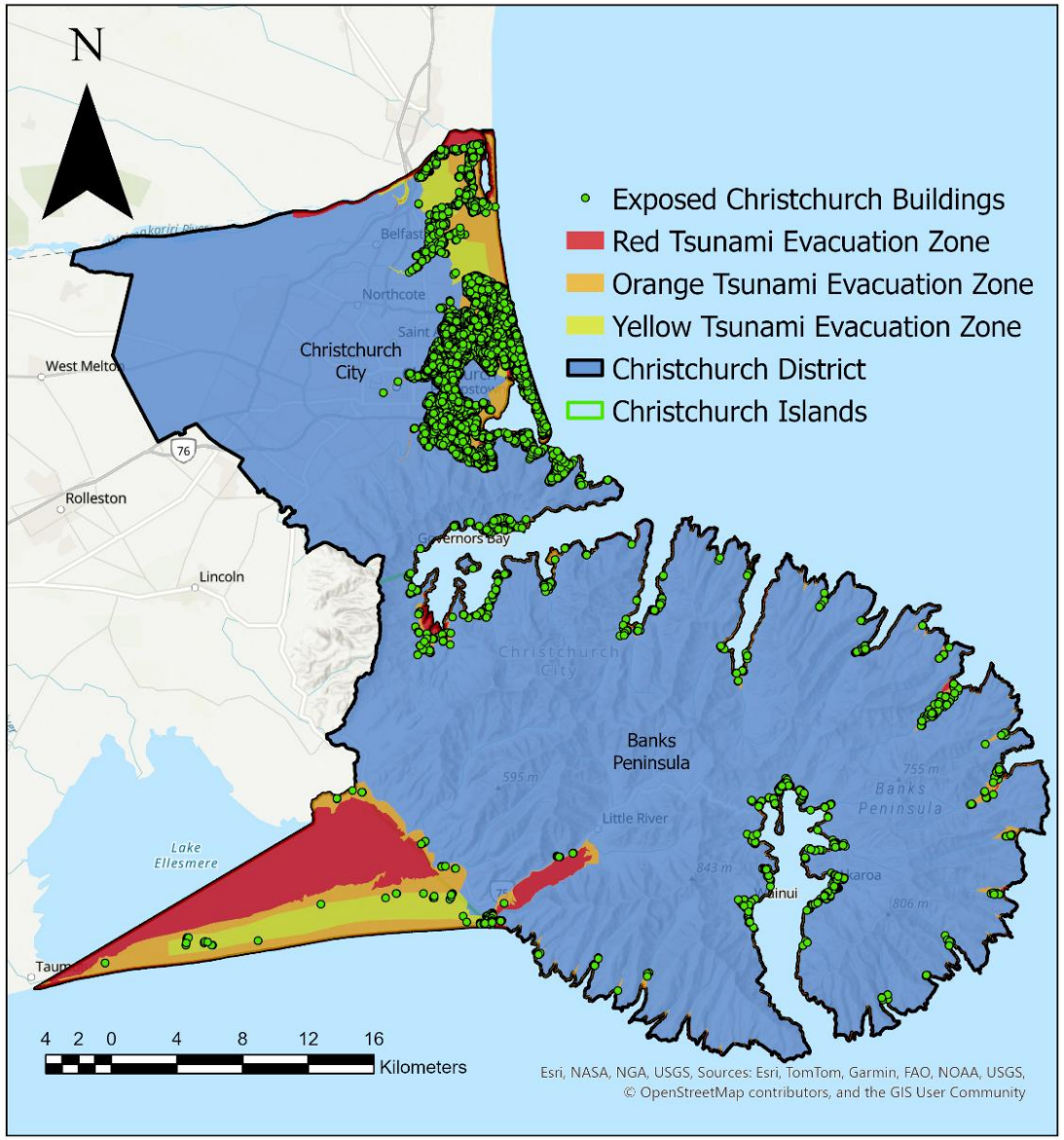
Buildings Potentially Exposed to Tsunami in Christchurch



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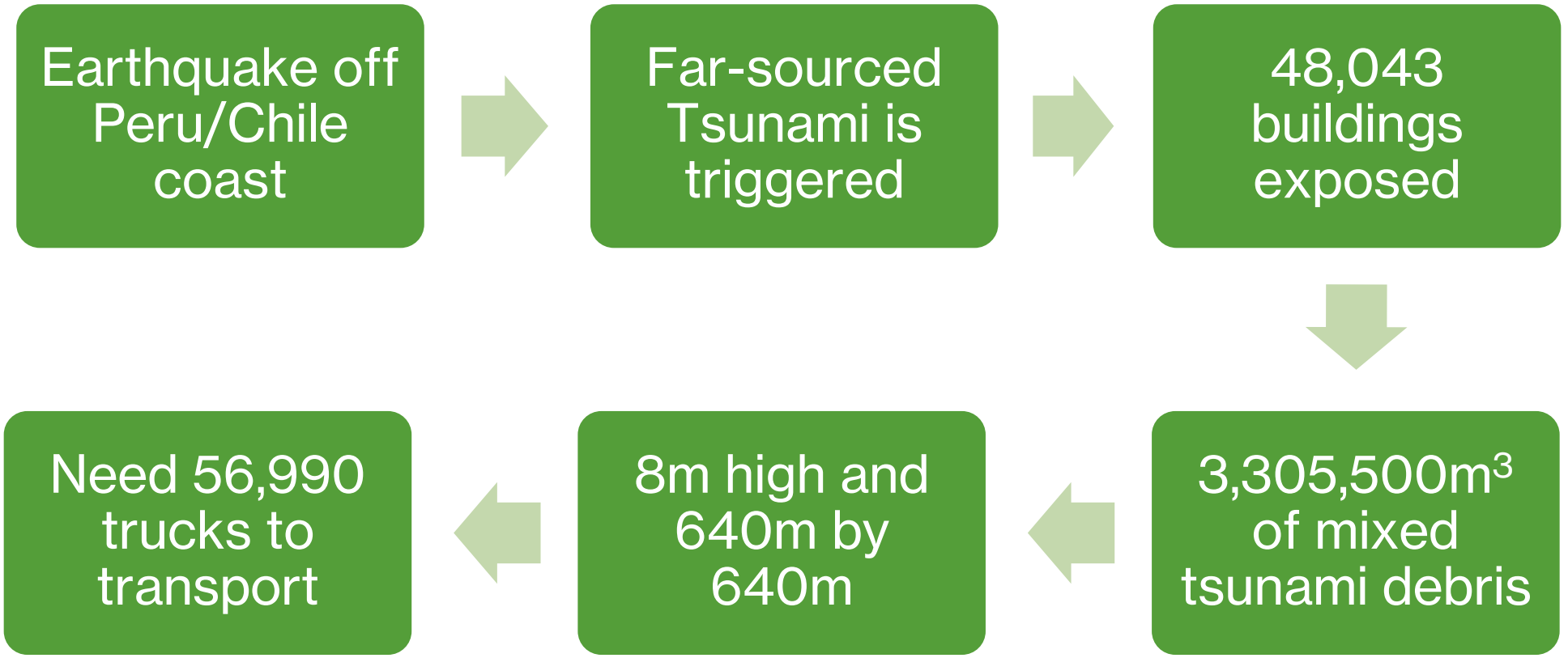
Example: Christchurch Tsunami



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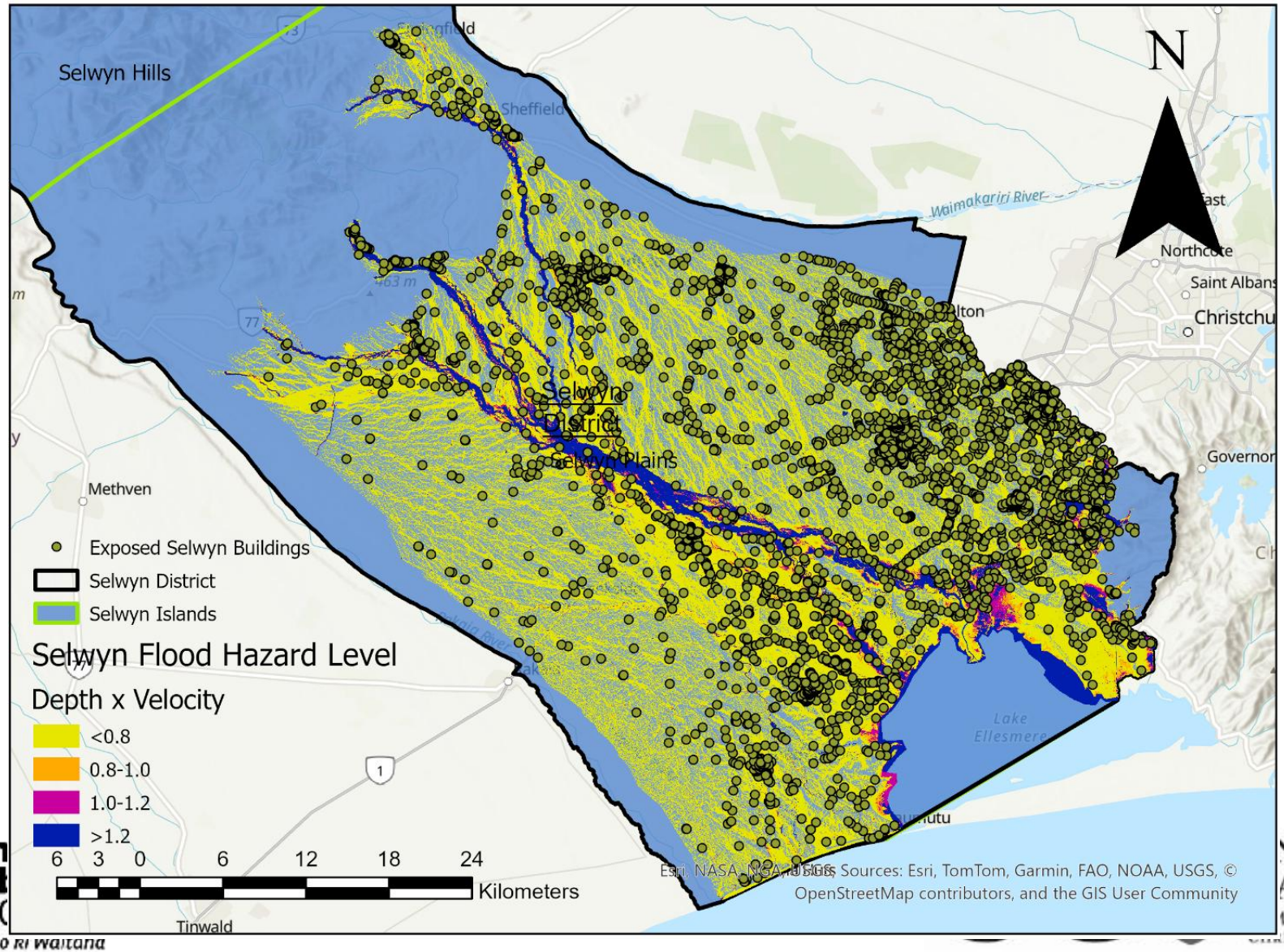
Buildings Potentially Exposed to Flood in Selwyn



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Example: Major Flood of the Selwyn River

Extreme weather in catchment → Excessive flooding of Selwyn River → 8,315 buildings exposed → 170,700 m^3 of mixed flood debris → 8m high and 150m by 150m → Need 2,940 trucks to transport

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Key Findings

- Earthquake – even distribution
- Tsunami – coastal concentration
- Flood – underrepresented, but important not to underestimate

- Concentration & magnitude of waste more important
- Tool to aid with management & planning decisions

- Model needs refining and updating

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Ngā mihi nui, he pātai?

Thank you very much, any questions?

Connor Wilson: connor.wilson@pg.canterbury.ac.nz

Heather Craig: heather.craig@canterbury.ac.nz

Jack Grinsted: Jack.Grinsted@ecan.govt.nz

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Reference slides follow…….

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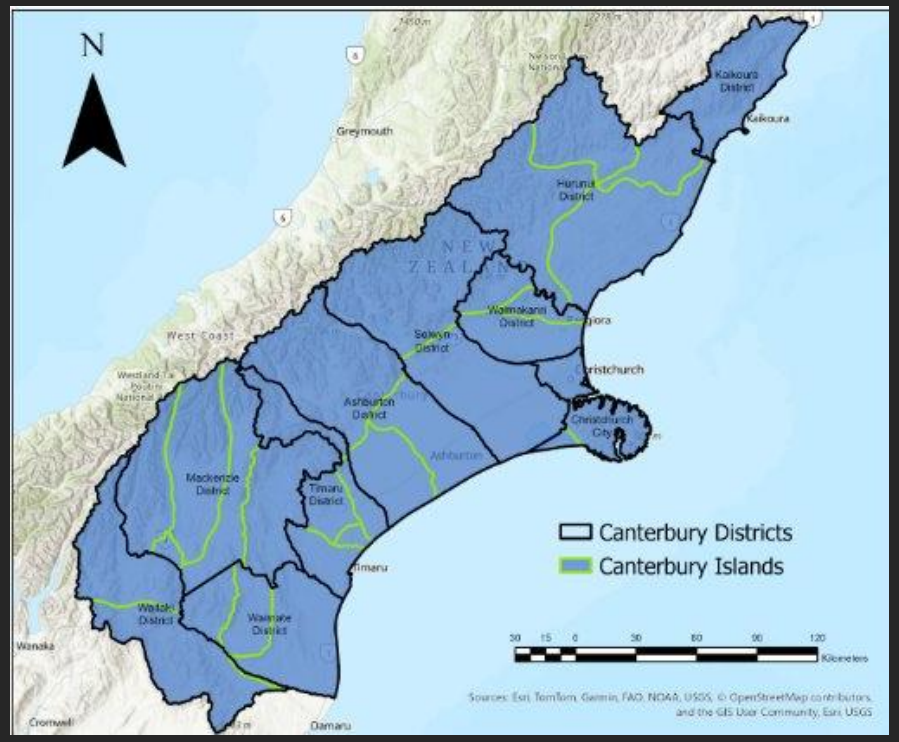

Disaster debris and waste estimates:

1. Waste types will not be wrong. Canterbury isolated “Islands” present a very likely outcome.
2. The estimates have been made on a range of assumptions. Models are always wrong and actual volumes will differ extensively based on disaster event.
3. However, the scale of waste volumes is what we believe is important to understand.
4. The workshops, discussions and planning that result from the estimates is the most important part.

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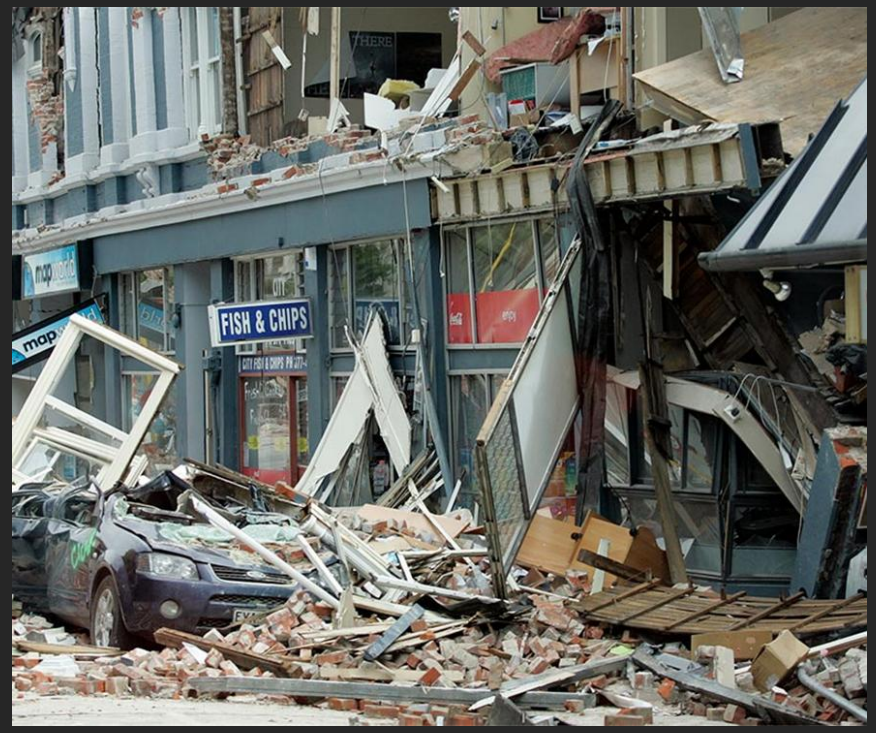
Councils vs CDEM roles in DWM



District councils (and their contractors) retain primary responsibility for disaster waste management.

CDEM and Regional Council support TAs:

- Research and planning
- Coordination and problem solving.
- Communication with community.
- Possible use of powers.

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Learnings

Regional Council working together with CDEM makes so much sense for disaster waste management planning.

District council waste management staff and their contractors should lead and coordinate disaster waste management in their local areas. Therefore they also need to be involved in planning along side their local CDEM staff.

Collaboration is hard work – but will lead to better environmental, social and economic outcomes if the planning is done well.

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Canterbury Disaster Waste Steering Group

- Input from TA waste management officers, CDEM staff, Te Whata Ora and University of Canterbury.
- Informal group who support the project by providing different perspectives.
- Collaboration is key for successful planning!

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Further reference slides....

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Clean-up and Disposal Efforts

Waste Management Organisations

WM New Zealand

waste MINZ

ENVIRONZ

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Volunteers

SVA CLUBS

Volunteering NEW ZEALAND

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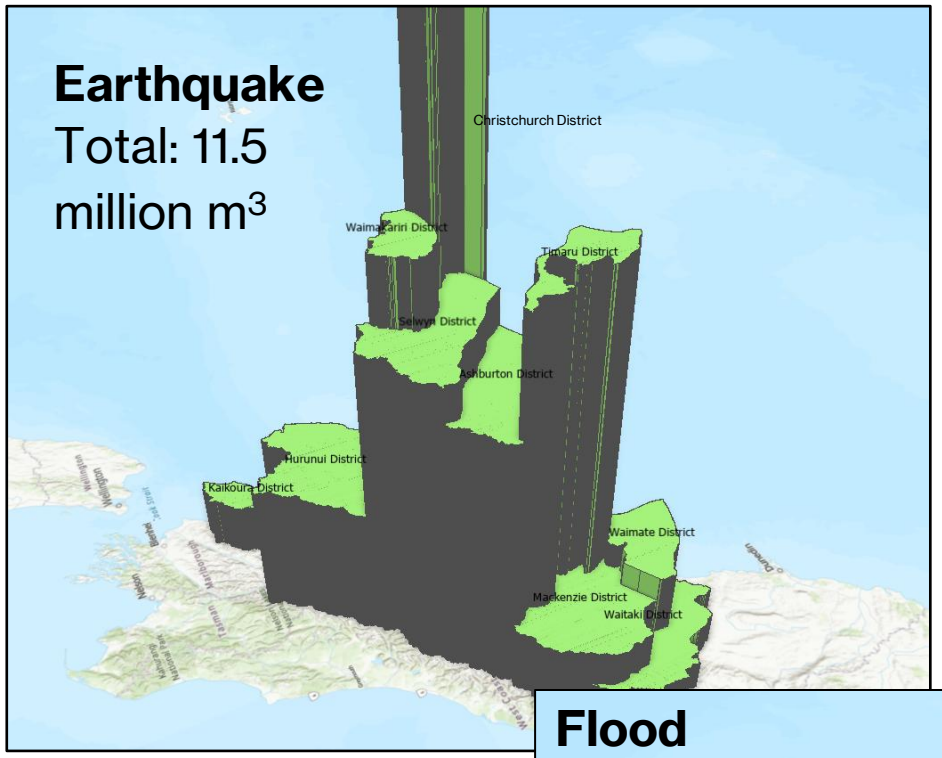
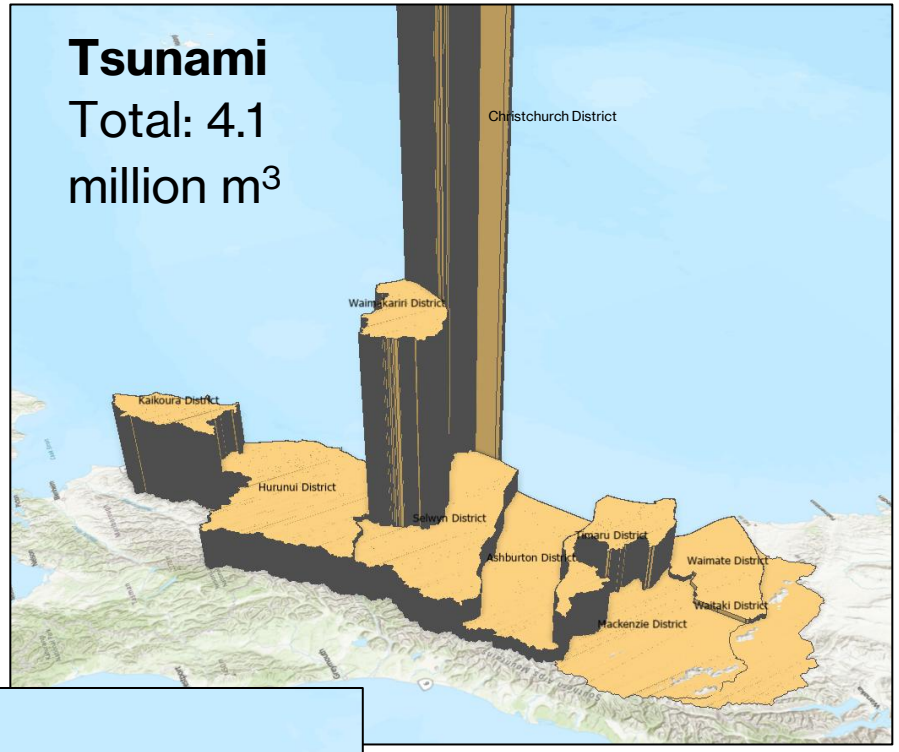
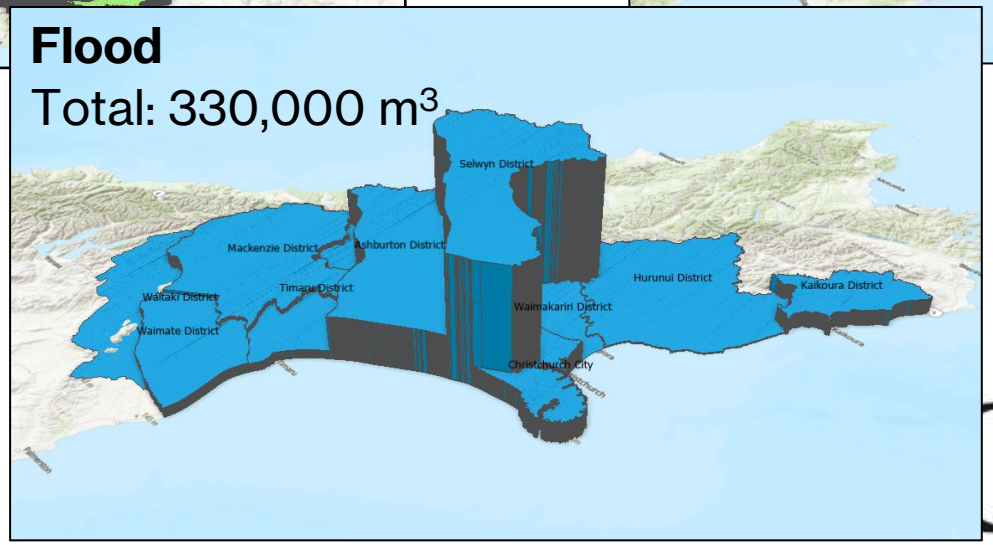
Disaster Waste Estimates for Canterbury

Absolute difference maps (same scale for each hazard)







Appendix

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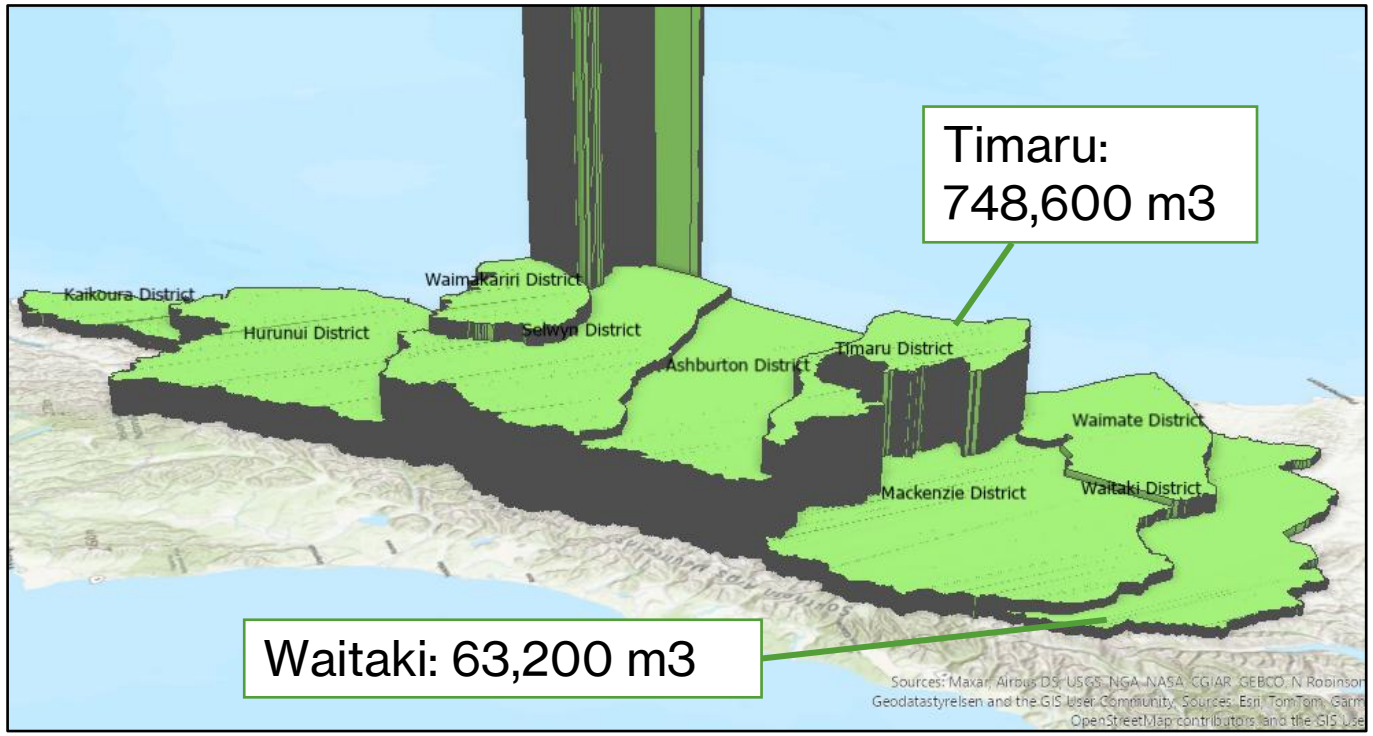
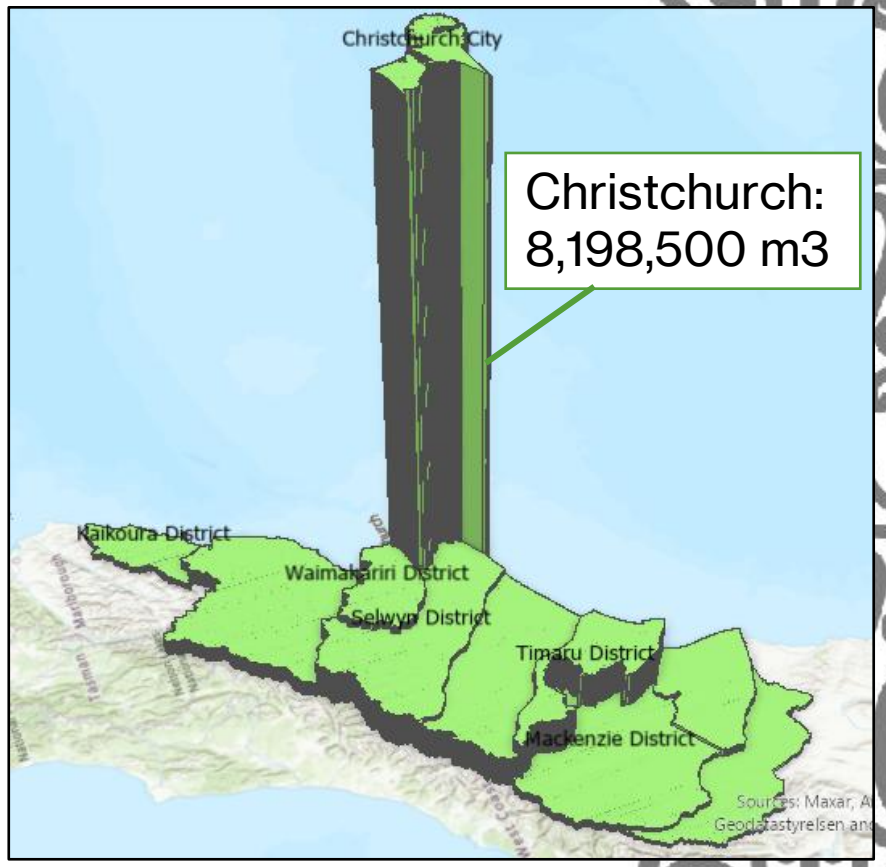
Disaster Waste Estimates for Canterbury
(scale altered per hazard to show relative difference per district)

Earthquake





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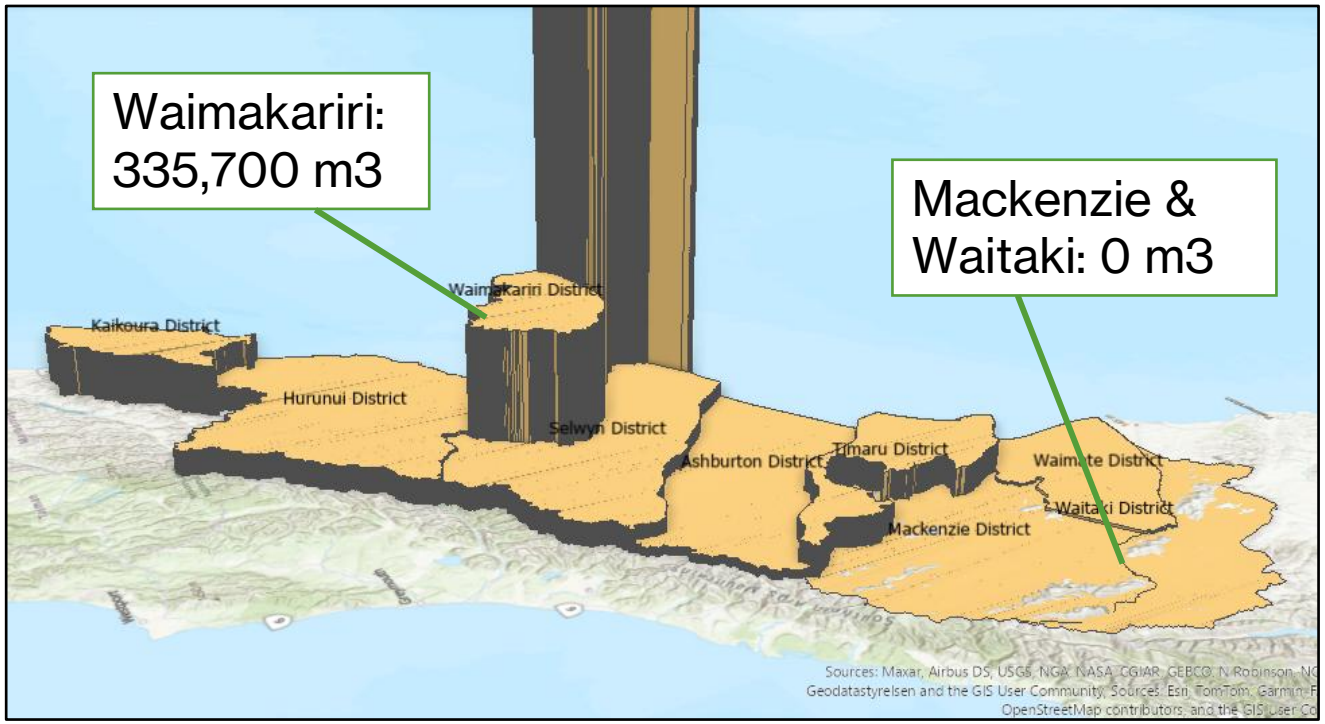
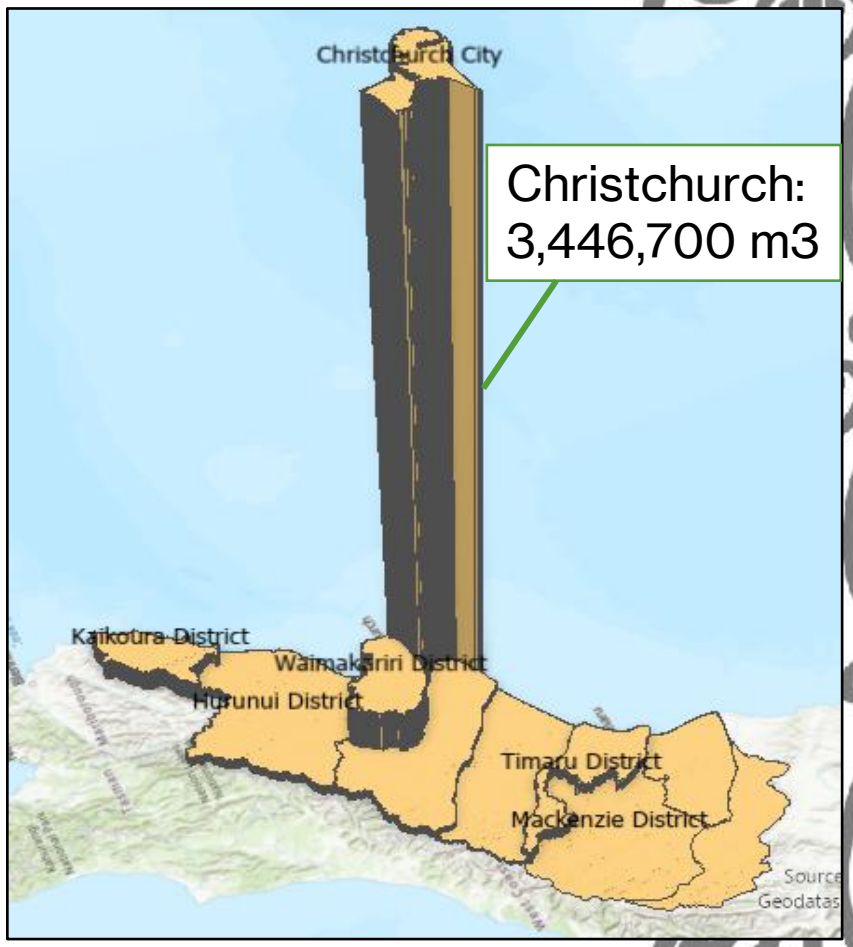
Tsunami





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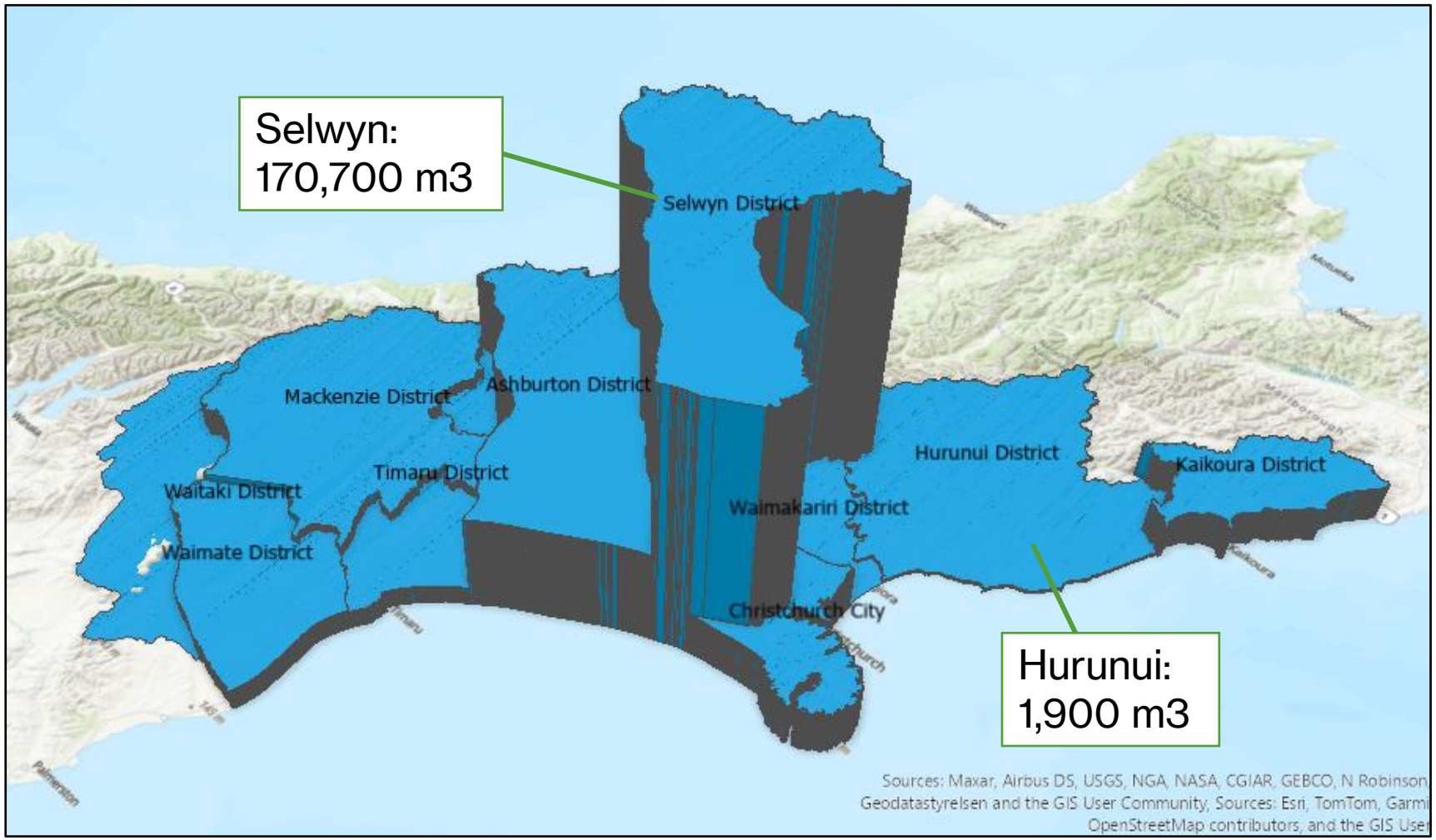
Flood



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Next Steps

Running district-level workshops

10

Presenting waste estimates

Identifying disposal locations and criteria

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