

# Safety doesn't take a holiday: Opportunities to understand visitor movements through infrastructure data

Resilience to Nature's Challenges – Built Infrastructure Meeting  
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# The challenge

Good disaster risk reduction initiatives require →

Good disaster risk assessments which require →

Representative exposure data

## Our current understanding

Measure	Estimated arrivals into Queenstown 16/17	
International Visitors Survey (Stats NZ)	1.4 million	Scaled up as IVS as does not allow for children. High Margin of Error
Accommodation Survey (Stats NZ)	1.8 million	Assumes non-commercial visits are the same as commercial visits, but they are twice as long. High Margin of error
Monthly Regional Tourism Estimate	1.5 million	Assumes same average fuel spend per day for all < 90 day visitors
Cellular Data (Qrious, Spark NZ)	1.3 million	Assumes 70/30 split of international and domestics
Arrivals at Queenstown Airport	0.9 million	Unknown international/domestic split

*After Byett, Welvaert, Stroombergen and Patterson (2018)*

## Who is exposed?

- Transient Populations
- Temporary Residents
- Semi Permanent Residents
- Permanent Residents

*Wilson and Simmons (2019)*

# The Alpine Fault and places we like to visit



# Research Direction

## To date

- Aim to understand what is currently done, gaps and opportunities.
- Mapping the datascape – lots of options – seeing this play out with COVID19
- Targeted interviews, workshops and meetings with decision makers about what is useful
- Preliminary modelling – using some different data sources, to inform a conversation

## Heading

- Create an initial predicative model, applying novel data sources/methods
- Workshop the 'so what' element with Emergency Managers to consider how it can best support disaster risk reduction (late 2020)
- Looking at technology to do a finer scale risk model -> whether this can inform site specific evacuation and risk models (aiming for Milford Sound/Fjordland Basin)

# Understanding expectations? (pre COVID)

## Expectations of Emergency Managers

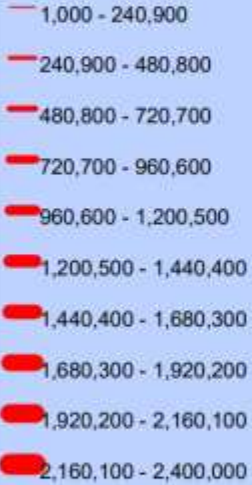
- Need to understand who is where, flow data is critical
- Emergency management priorities will not be driven by nationality, rather need
- Flows and changes in tourism results in changing risk profiles – one of the biggest unknowns
- A predicative model is the most useful – to workshop/run scenarios

*“Tourism industry [in the area] is already highly collaborative”*

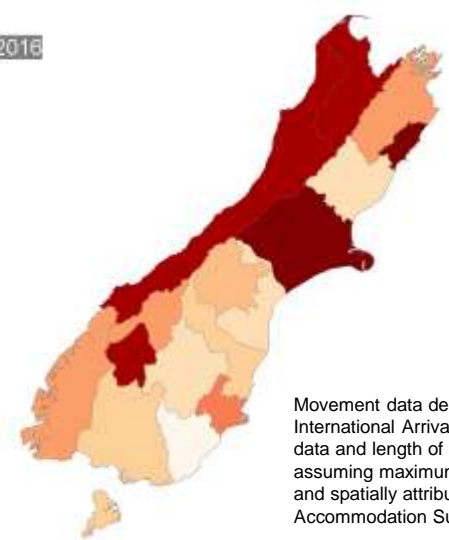
*“World class leaders, in a world class industry, that is prepared for a disaster”*

# People move through space

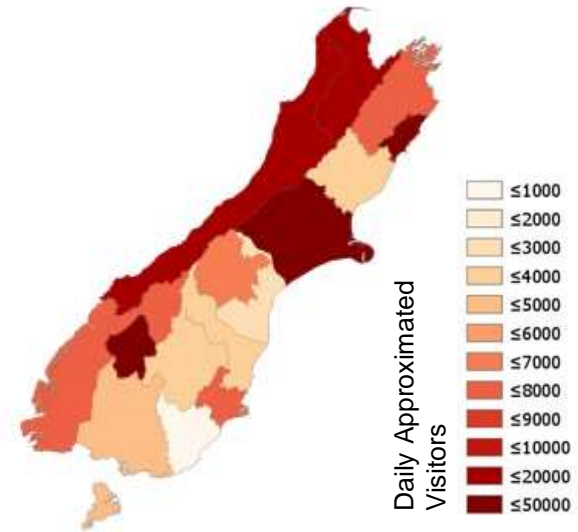
## Analysis Key:

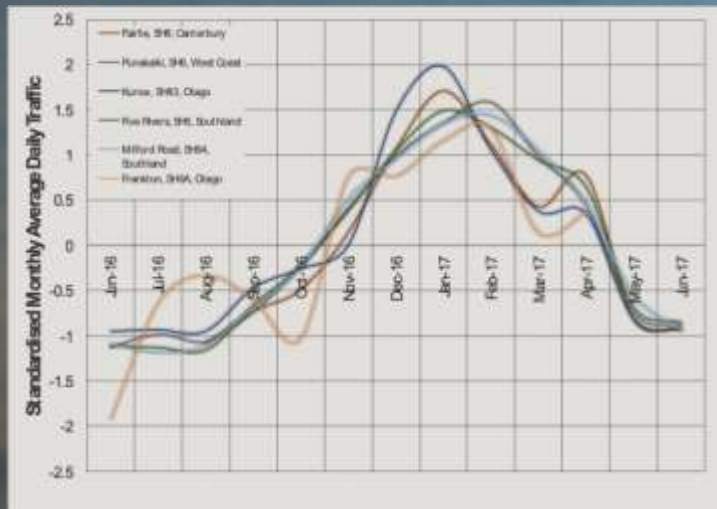


31/01/2016



Movement data derived from International Arrival and Departures data and length of stay (MBIE), assuming maximum visit of 30 days, and spatially attributed from Accommodation Survey





# Tourism businesses open

Derived from Google API



# Southland Floods – February 2020

stuff national

HOME LOCAL SPORT POLITICS FINANCE WORLD ENTERTAINMENT

NEWS > NEW ZEALAND

## Trapped tourists to remain at Milford Sound as weather hampers rescue effort

Rachael Kelly • 16:28, Feb 04, 2020

Facebook Twitter YouTube

Lacy Quiggin • NEWS • Monday, 3 February 2020 6:31 pm

## Thousands flee severe flooding in New Zealand

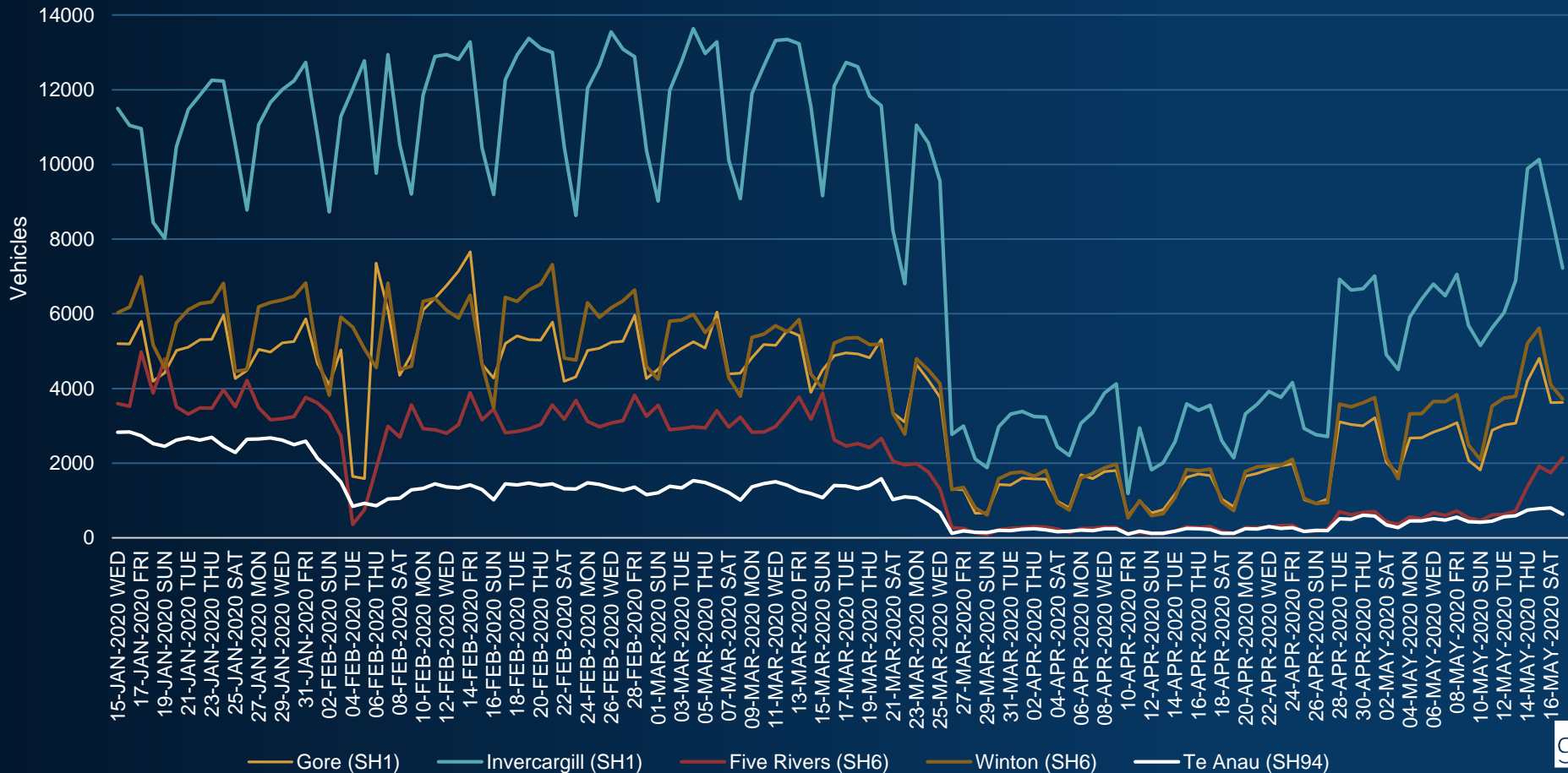
NEWS / ENVIRONMENT

Southland region declares a state of emergency after being deluged with more than 1,000 mm of rainfall in just 60 hours.



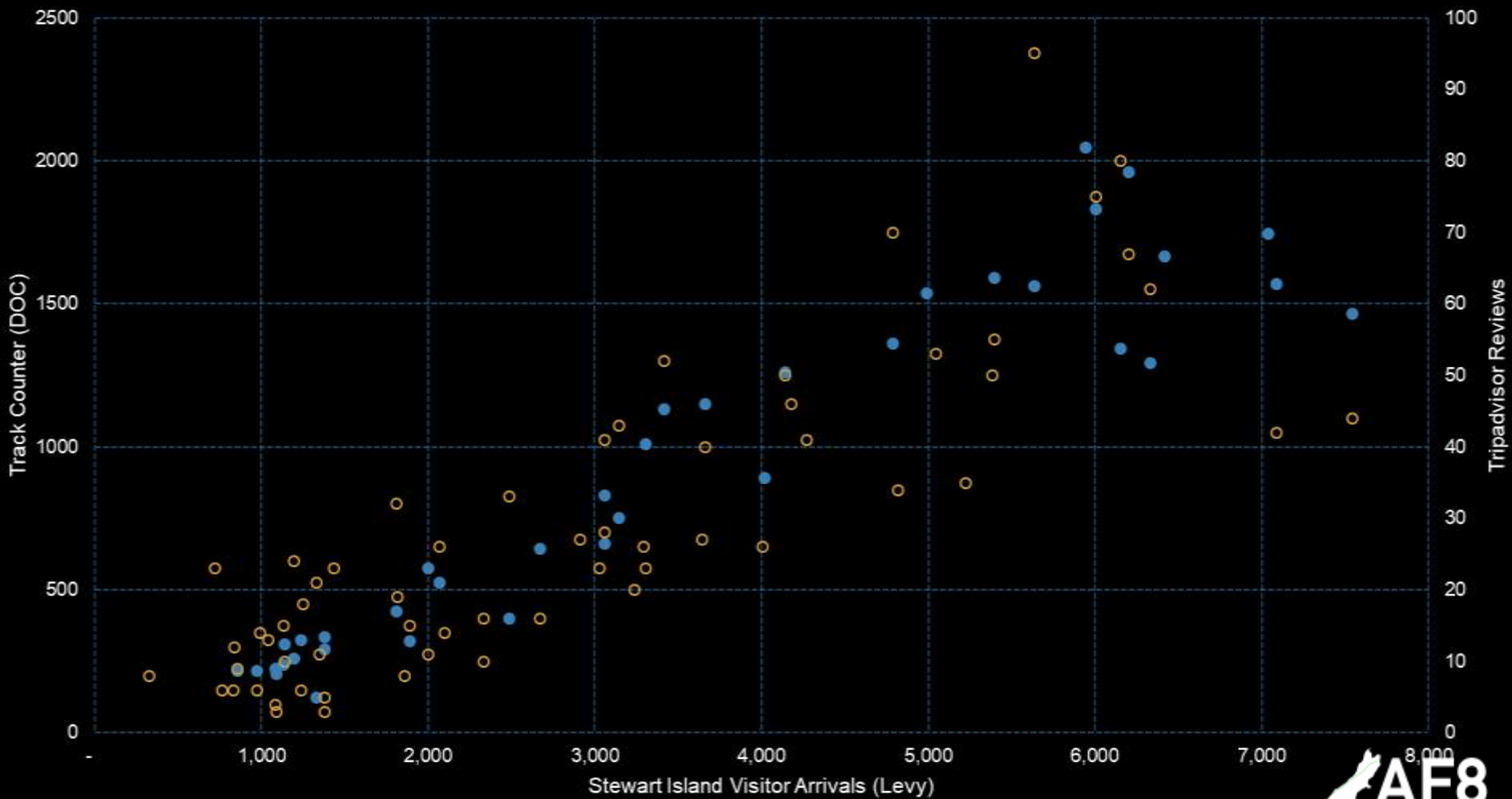


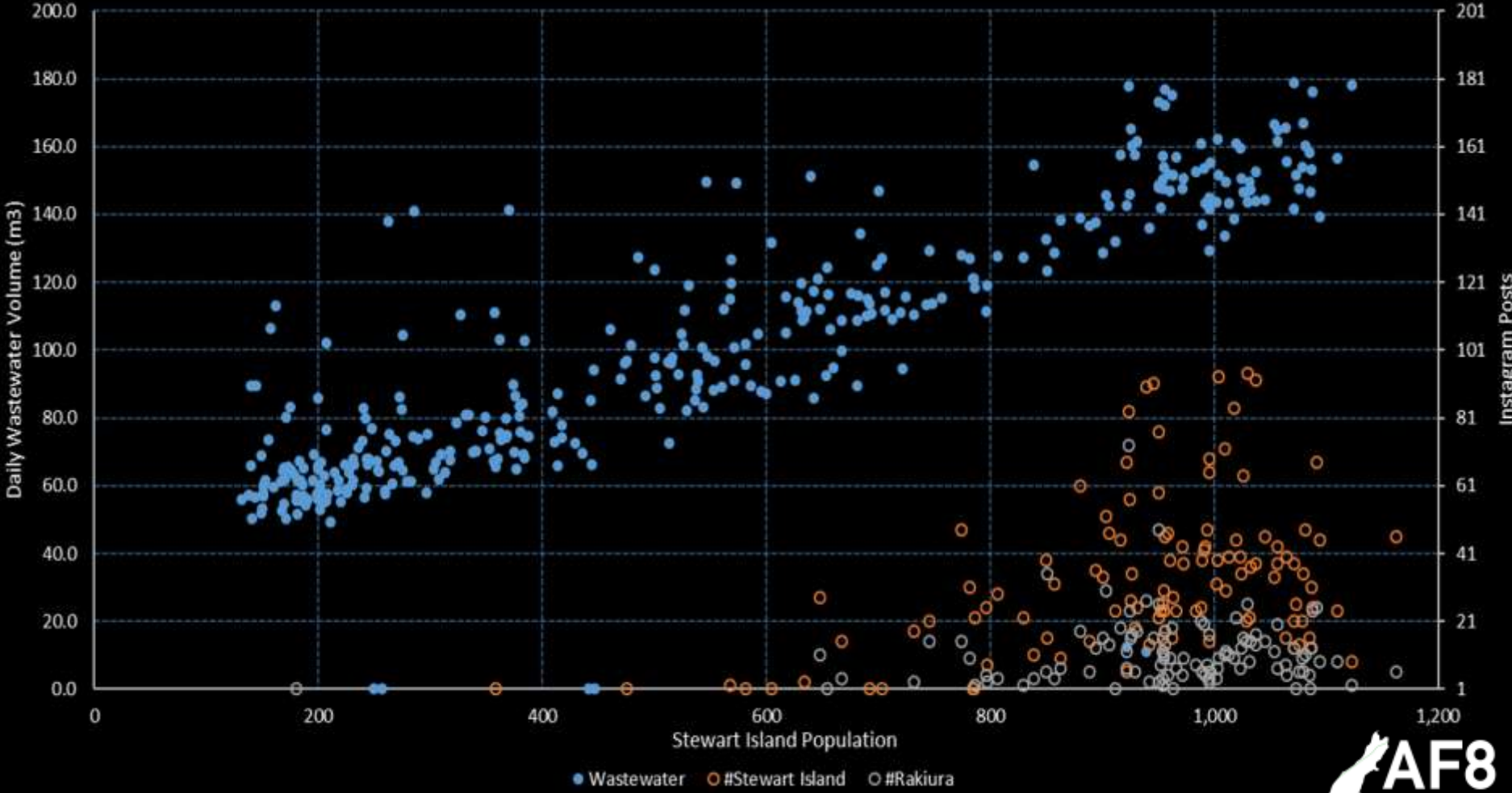
# Vehicle Movements - NZTA monitoring sites - Southland



# Calibrating Models, Ideas and Data Sources







# Understanding interaction with place through wifi probe requests

Wifi Capable devices continuously search for a nearby access point, regardless of whether they are connected to a network.

1. Does this represent devices in an area?
2. Proxy for people in an area?
3. Inform DRA? (i.e. dynamic exposure)
4. Diurnal approximation

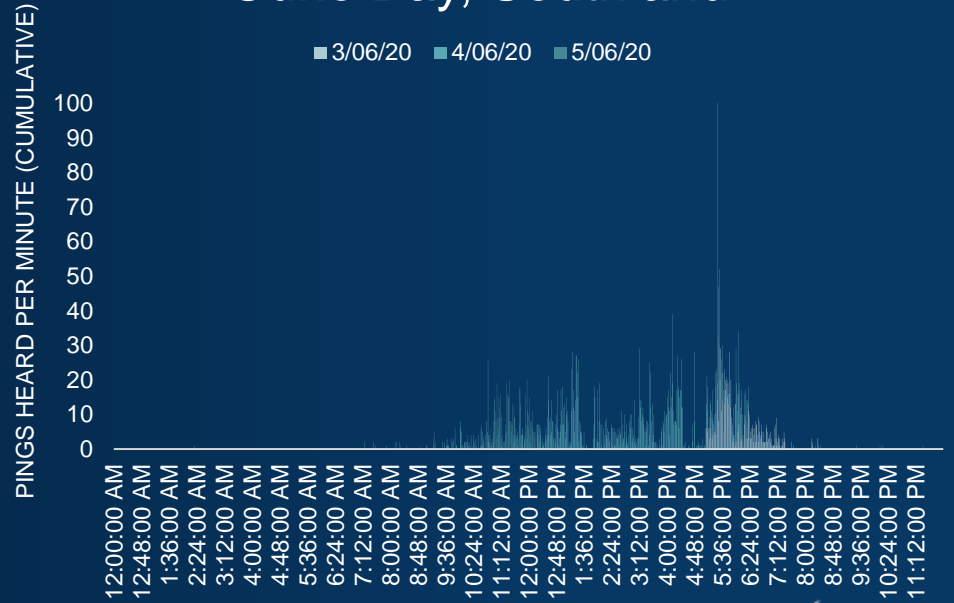


# Understanding interaction with place

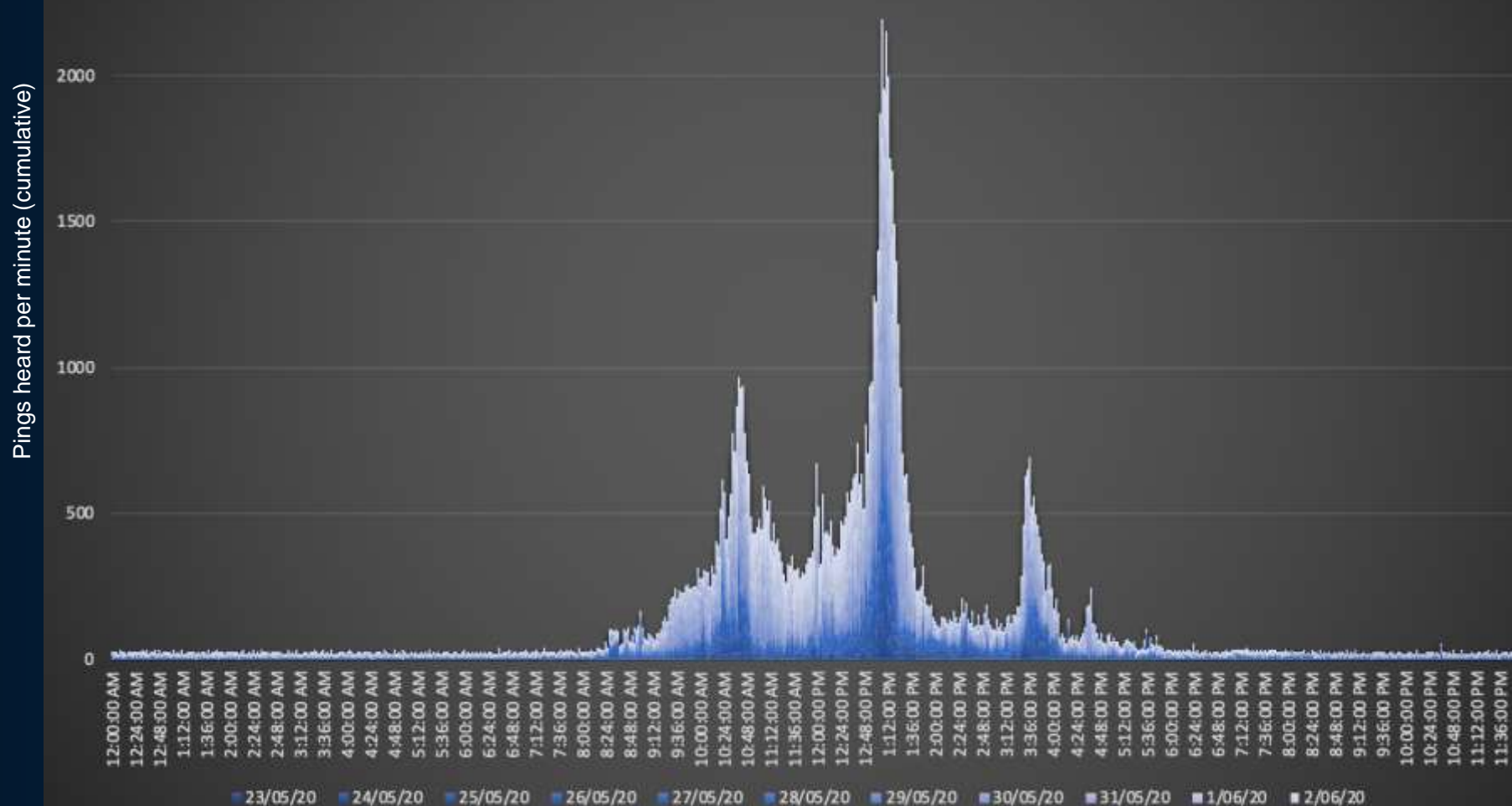
## through wifi probe requests

- Wifi capable devices continuously search for a nearby access point, regardless of whether they are connected to a network.
- Does this represent devices in an area?
- Proxy for people in an area?
- Inform DRA? (i.e. dynamic exposure)

### Curio Bay, Southland



# Wifi 'Pings' at Milford Sound Terminal



# Thanks!

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Photographs by [Unsplash](#)

