



# Ministry of Civil Defence & Emergency Management

Te Rākau Whakamarumarū

**Standard for the use of sirens in tsunami warnings**

# **Standard for the use of sirens in tsunami warnings**

**Context: the standard covers part of a broader picture:**

**Sirens are one form of public alerting**

**Public alerting sits within a national framework**

**Being developed as a technical standard under the Act:**

**Sections 8&9 – functions and powers of Director**

**Under s. 53(2), CDEM group plans must take account of it – similar to Director's guidelines**

## **What the standard is and is not**

### **The standard is:**

**Guidance on how sirens should be utilised within tsunami warnings if groups/TAs are using or are intending to use them**

### **The standard is not:**

**A generic “sirens” or “public alerting” standard**

**A decision-making tool on siren usage**

**An endorsement for the use of sirens**

# **Ministry of CDEM position on use of sirens**

Unchanged from previous position outlined to groups in May 2012:

**Sirens not regarded as effective or reliable alerting mechanisms for local source events**

**Evidence supports this – short travel times leads to issues with: triggering of sirens; time required to issue official warnings; creation of a false sense of public comfort; creation of expectations of warnings, and delays in responses**

**Earthquakes can limit effectiveness of sirens – can render them inoperable**

**Issues with audibility as well – wind, indoor/outdoor clarity**

**All concerns were evident in the Japan tsunami event**

## **Ministry of CDEM position cont.**

**Use of sirens can be effective for regional and distant events, but normally a lesser threat and a longer warning time, meaning that other communications can and should be used**

**Use of fixed coastal sirens used solely for tsunami is not advised. Should be used as a generic alerting mechanism**

**Voice capability gives a more effective response**

## **Background to development of standard**

**May 2012: MCDEM outlines position to groups in - no further guidance would be issued at this time**

**June 2012: Waikato CDEMG requests re-consideration; Minister requests Director to investigate/further consider**

**Late 2012: Tauranga City Council approaches Director; MCDEM agrees to develop, but has other urgent work items**

**April 2013, the Waikato CDEMG writes to the new Minister of CDEM regarding timing, how groups would be engaged and when a decision could be expected**

**Ministry of CDEM has re-prioritised budget to develop this year**

## **How the standard is being developed**

**By seeking to understand what's happening across the country, and the implications of a standard mainly for Territorial Authorities and CDEM groups**

**Seeking advice from the sector on what the standard should cover, and why**

**Seeking international standards/best practice guidance**

**Working alongside the NZFS**

**Seeking independent advice on the audibility aspects of sirens**

**Project team:**

**Ministry of CDEM**

**GNS Science**

**NZFS**

**Project manager**

**University of Canterbury Acoustics Research Group**



## **Mechanical vs. electronic sirens**

**Important to understand how these work – it is fundamental to the standard**

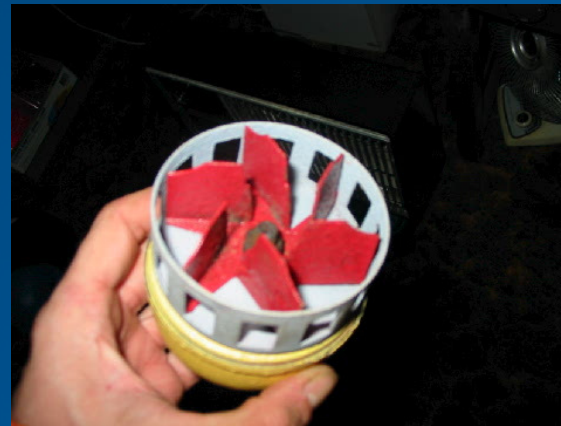


# Mechanical sirens

Sirens with a stator and rotor driven by an electric motor



airraidsirens.com



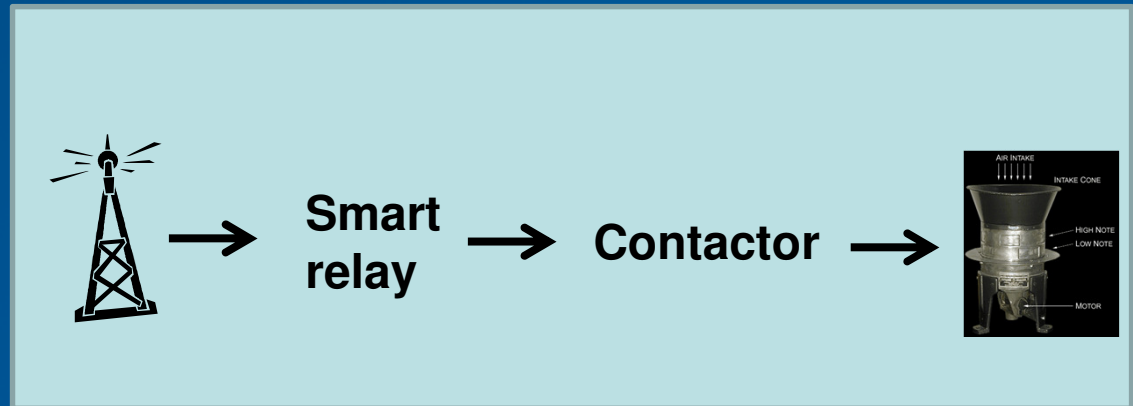
airraidsirens.com



Smart  
relay

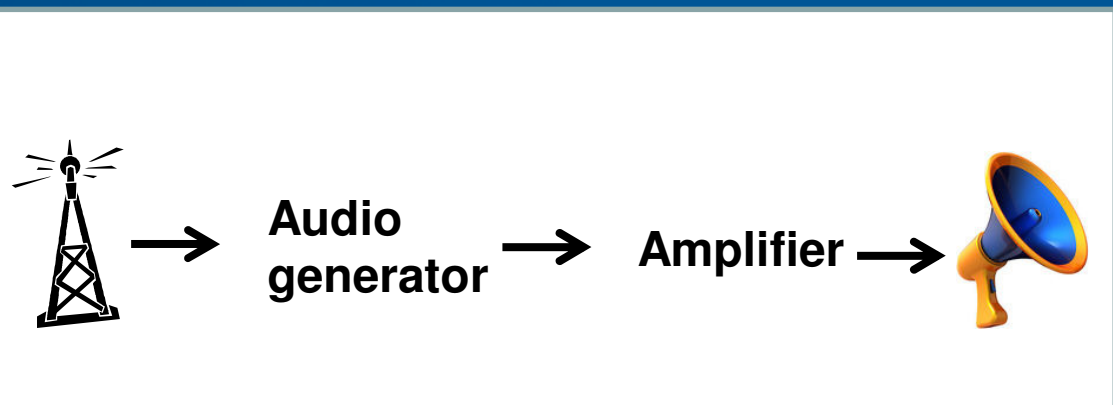


Contactor

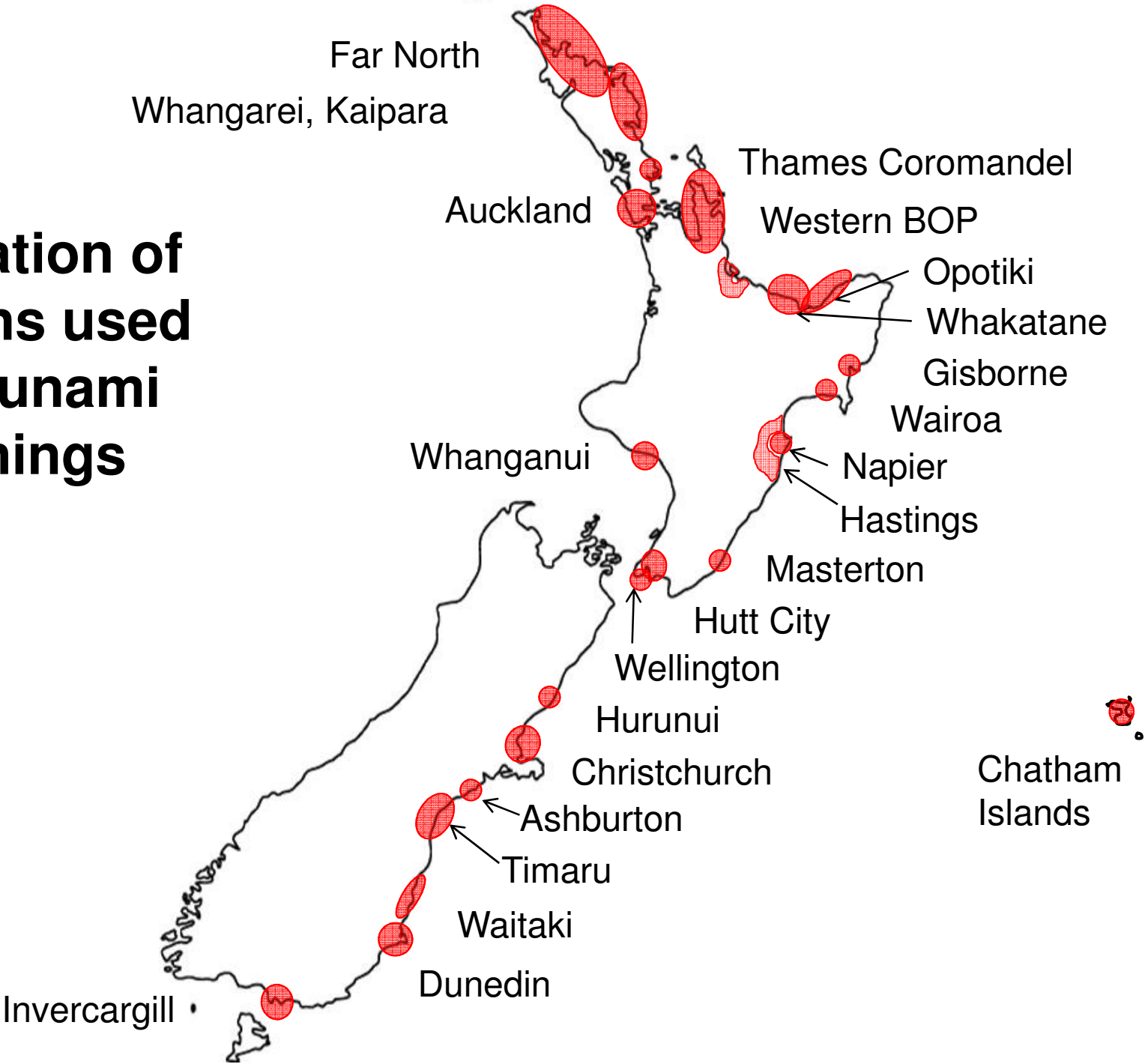


# Electronic sirens

Sirens with an audio generator, amplifier and external speaker.

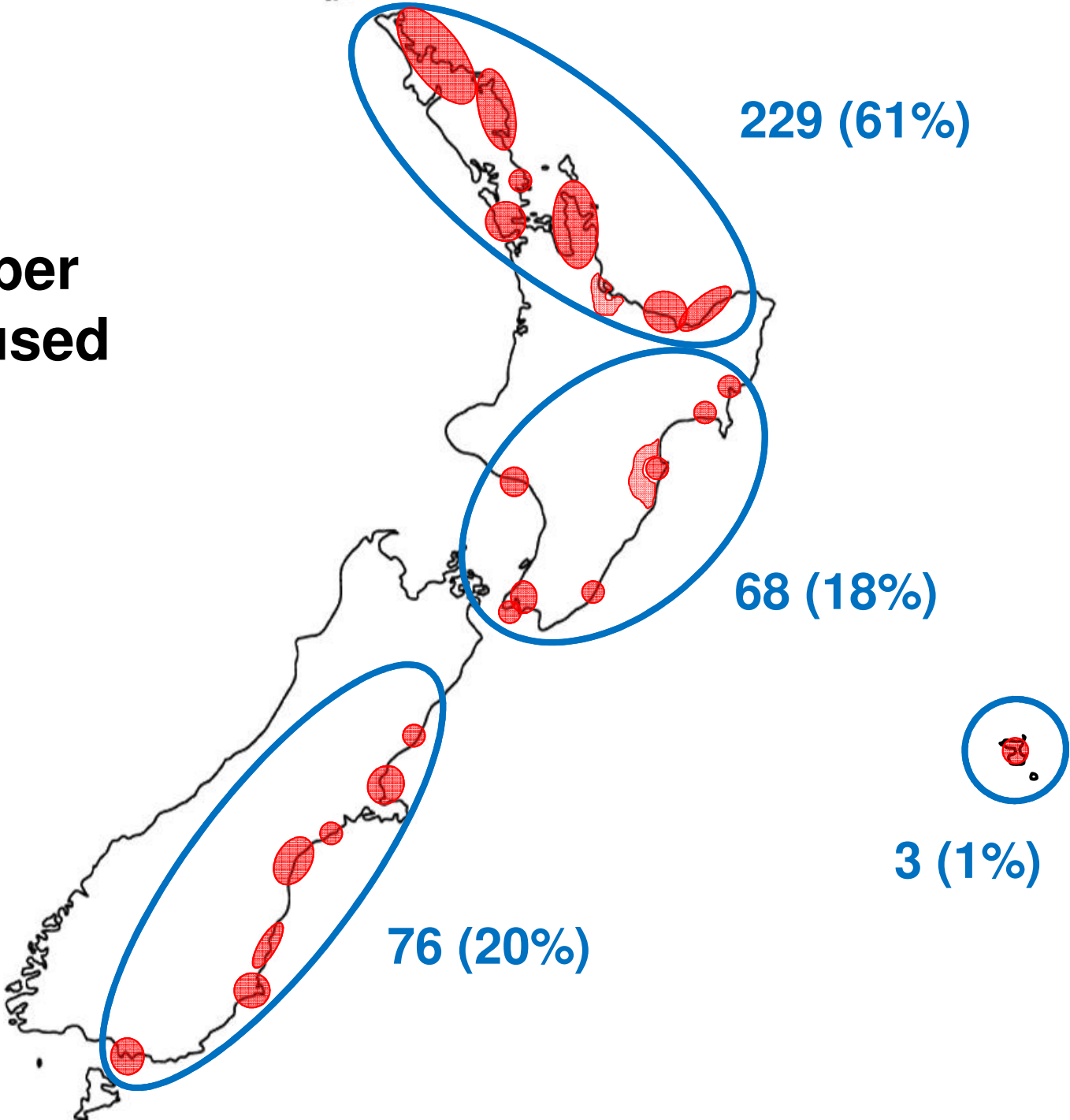


# Location of sirens used in tsunami warnings

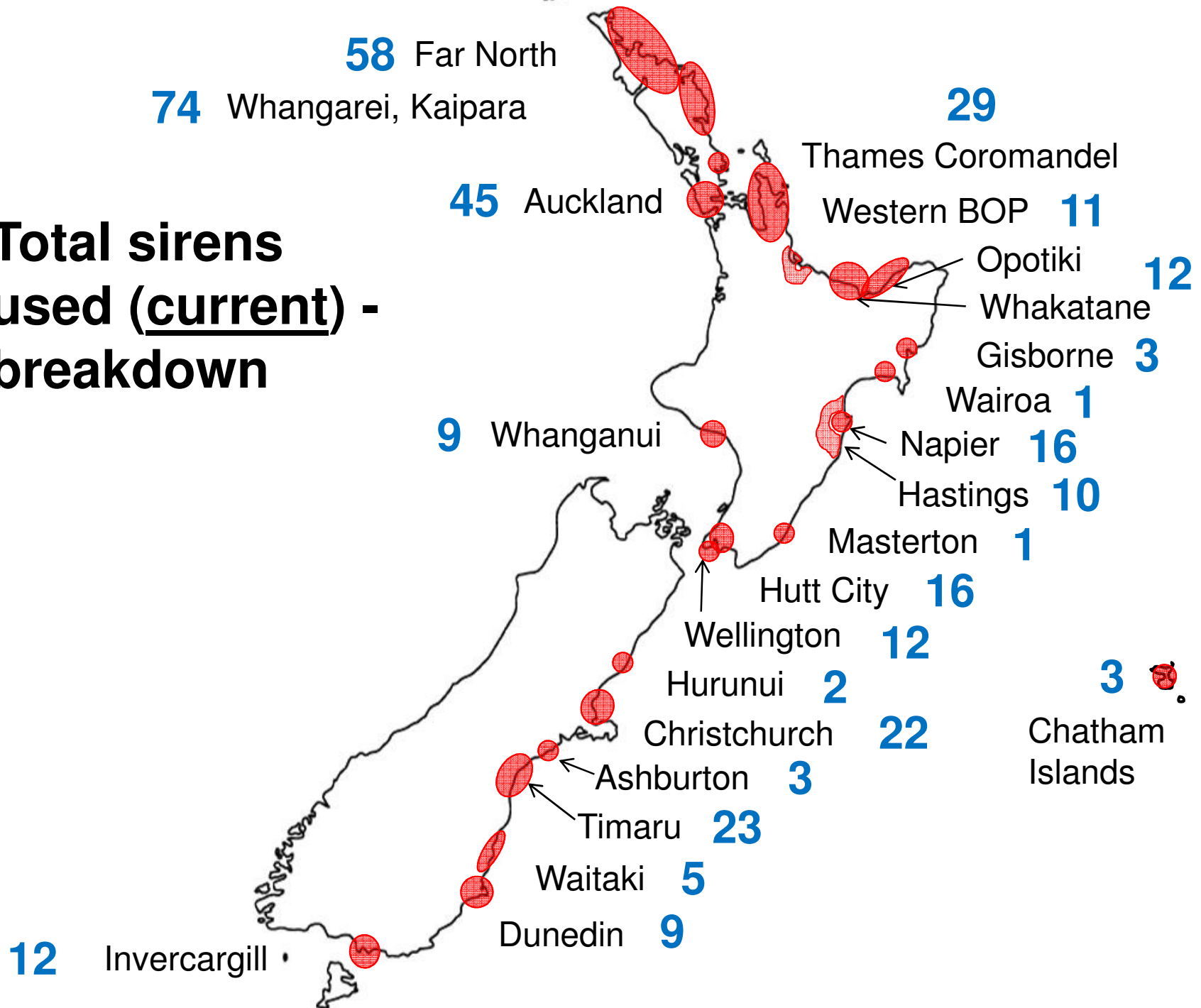


**Total number  
of sirens used  
(current)**

**376**

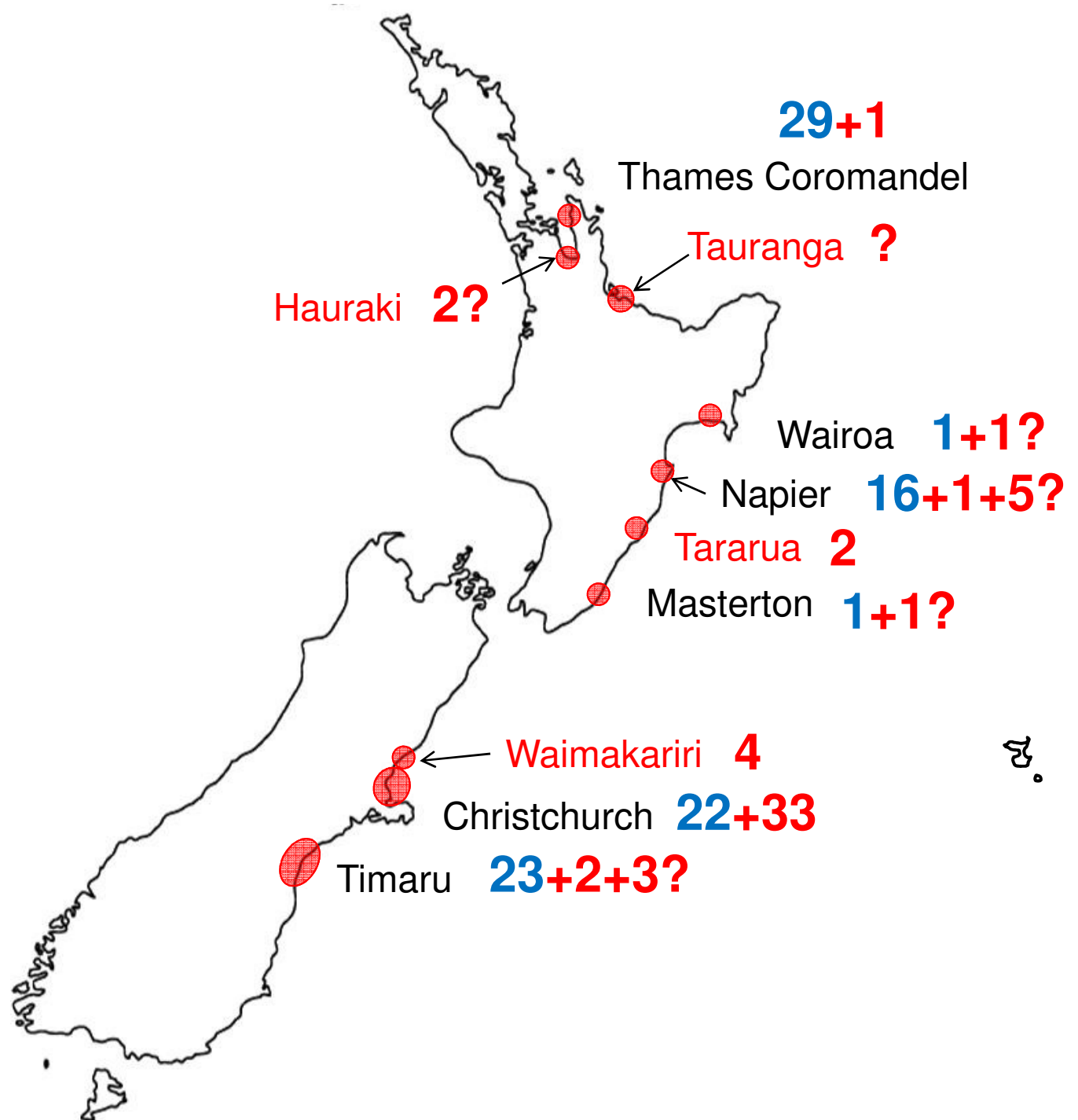


# Total sirens used (current) - breakdown



# Proposed sirens

~55+?



# Siren types

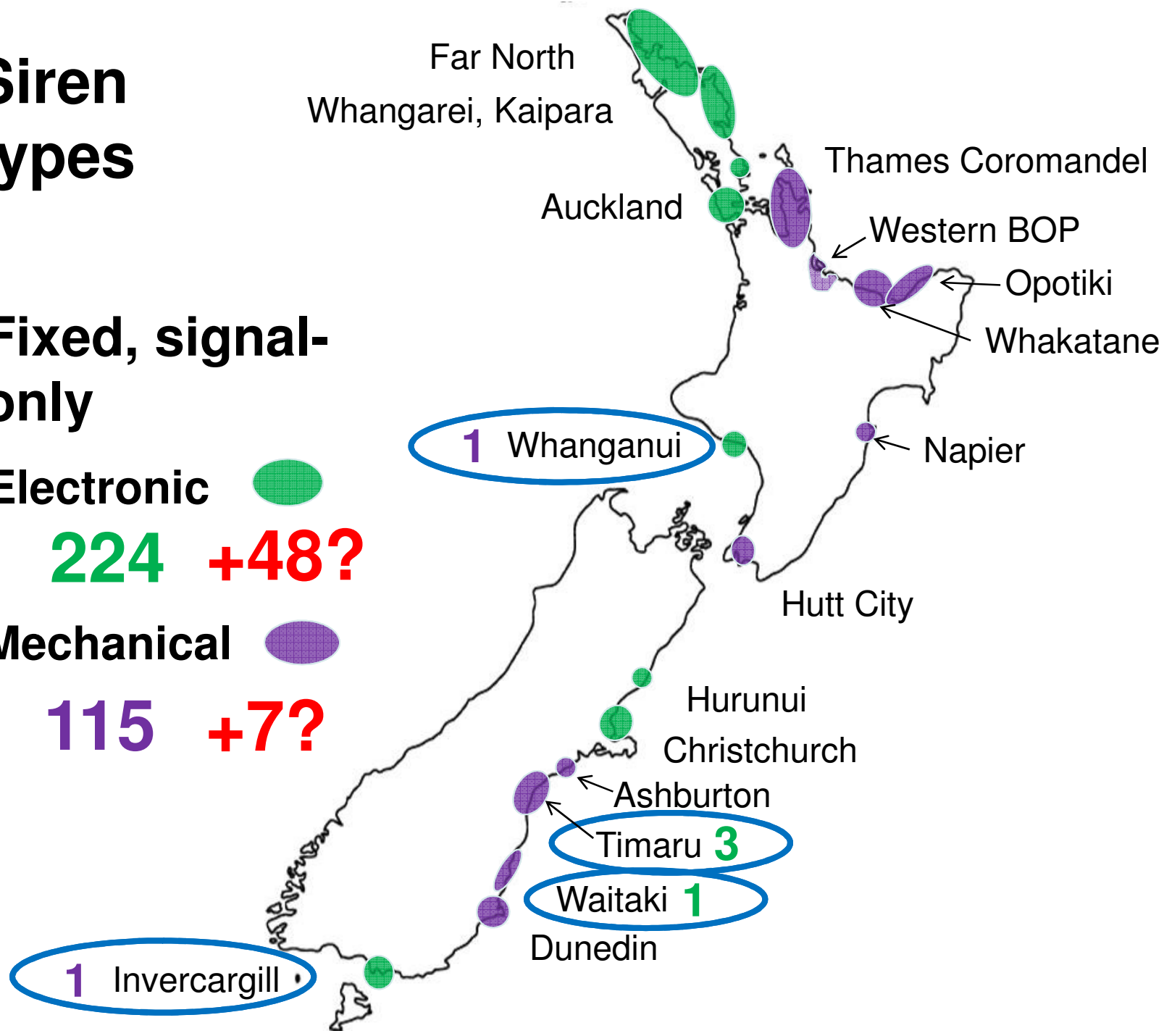
Fixed, signal-only

Electronic

224 +48?

Mechanical

115 +7?

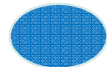


8.

# Siren types

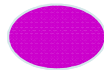
## Mobile sirens (dedicated)

Vehicle



28

Trailer

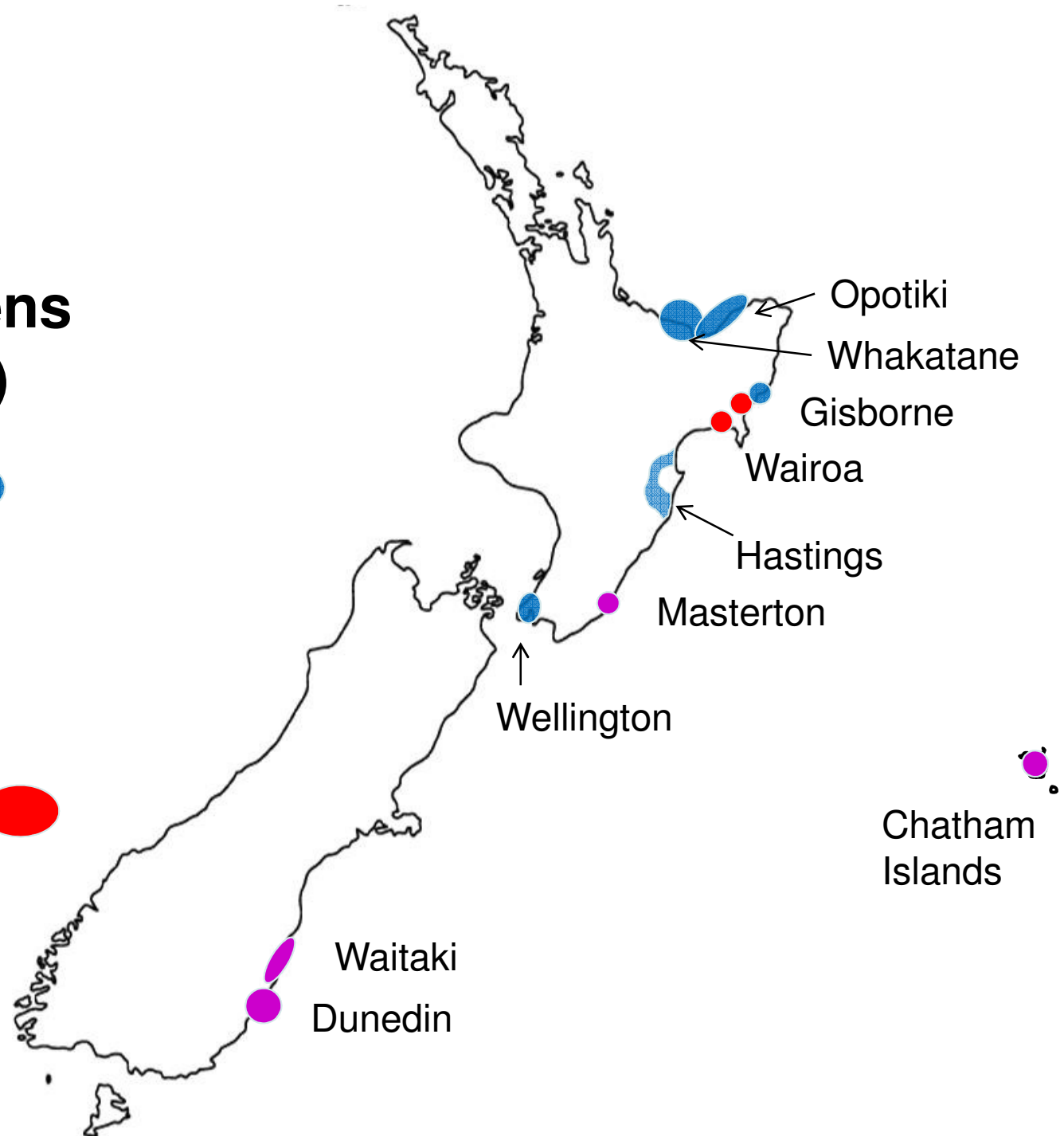


7

Helicopter

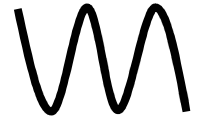


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# Tsunami signals

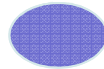
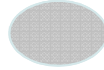
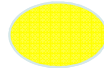
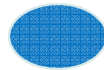


The Sting

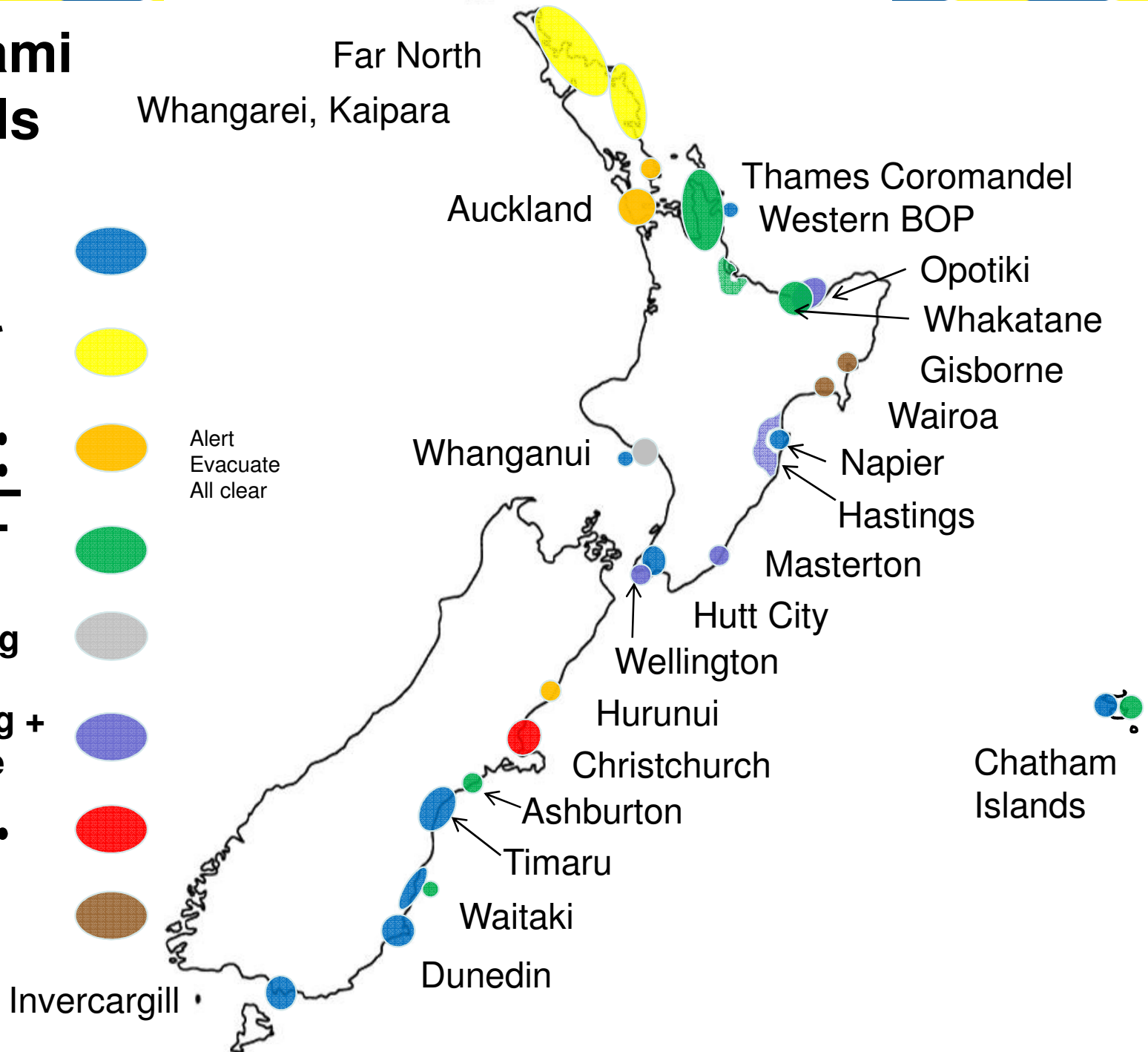
The Sting + message




PA only

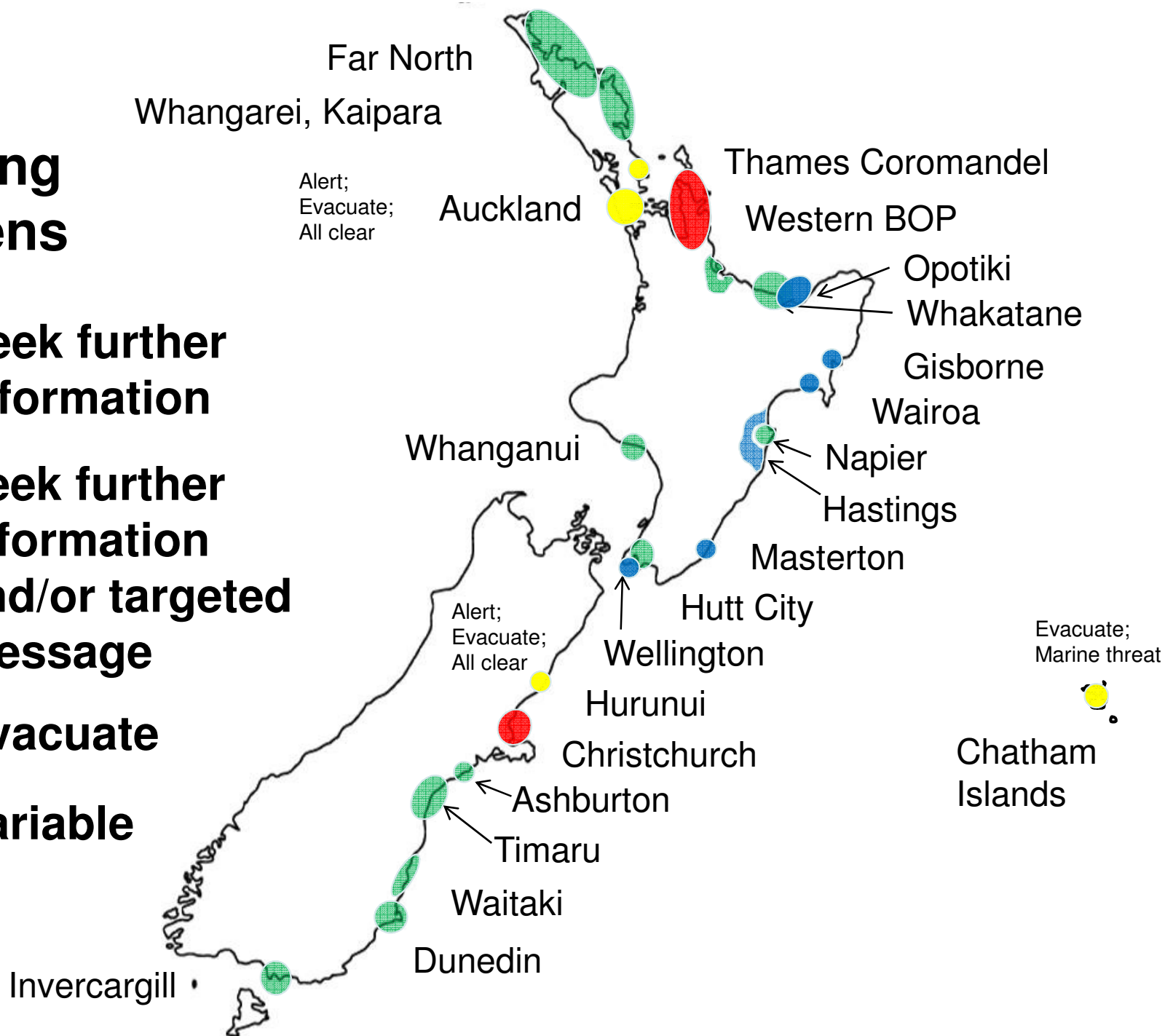


Alert  
Evacuate  
All clear



# Meaning of sirens

-  **Seek further information**
-  **Seek further information and/or targeted message**
-  **Evacuate**
-  **Variable**



## **Collective feedback from the CDEM groups/TAs**

**Usage must be linked to public education and awareness activities and evacuation planning**

**Need national consistency in the tone and meaning of sirens**

**Clarify the basis for activation and responsibility for activation**

**Usage of sirens should be risk-based**

**Use sirens as an all-hazards alerting mechanism**

**Sirens are a subset of group warning systems – warning systems for tsunami should employ the use of multiple alerting channels**

**The use of sirens should align to the National Warning System, and be complementary to all MCDEM tsunami guidance**

**Sirens are one public alerting option among many**



## **Collective feedback from the CDEM groups/TAs**

**Use for distant events and where possible for regional events.  
Never guarantee usage for local events**

**Test on a regular basis**

**Develop a realistic and achievable maintenance programme and budget**

**Look to the future – on-going consideration of emerging warning systems technology**

# What does the standard cover?

Introduction – purpose, background, MCDEM position

Principles

Management/operational requirements

Signal

Public education and awareness

Meaning

Use of sirens in response planning

Maintenance

Links to hazards and risks

Testing

Audibility, installation and review

General considerations for CDEM groups/TAs

Standard will be concise – detail in supporting report

Draft nearing completion; consultation coming soon....