



Landcare Research
Manaaki Whenua

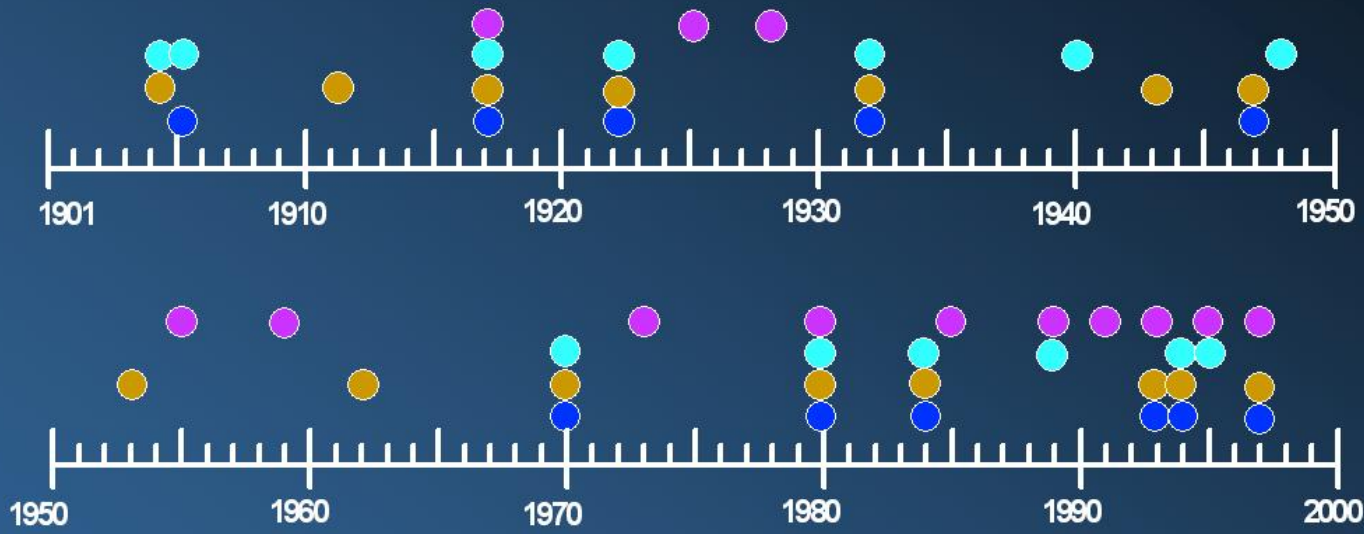


Surveillance and forecasting: the role of citizen science

Andrea Byrom, Jennyffer Cruz, Roger Pech

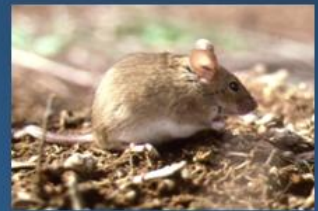
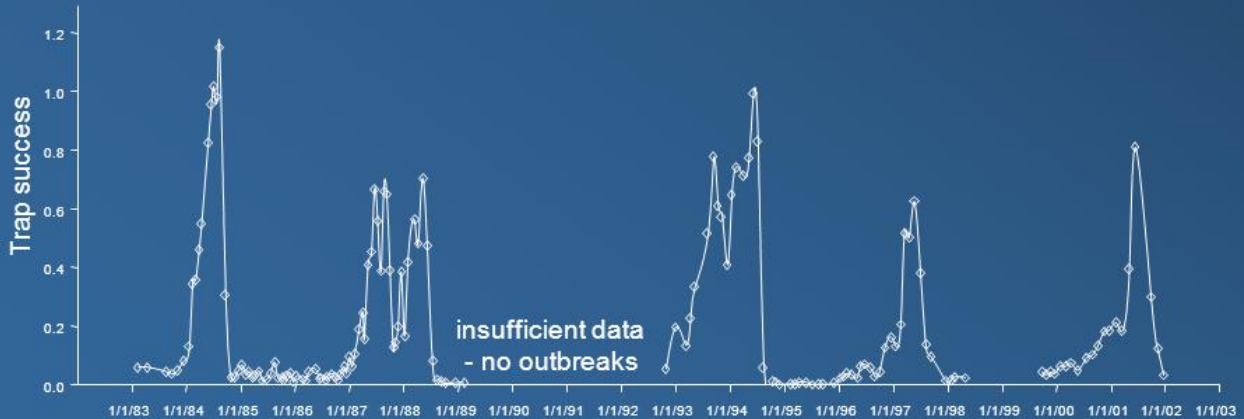


House mice (*Mus domesticus*)



REGION:

- South-east Queensland
- New South Wales (Northern and Southern)
- South Australia (Eyre-Yorke Peninsula and/or Mallee)
- Victoria (Mallee and Wimmera)



Singleton *et al.*



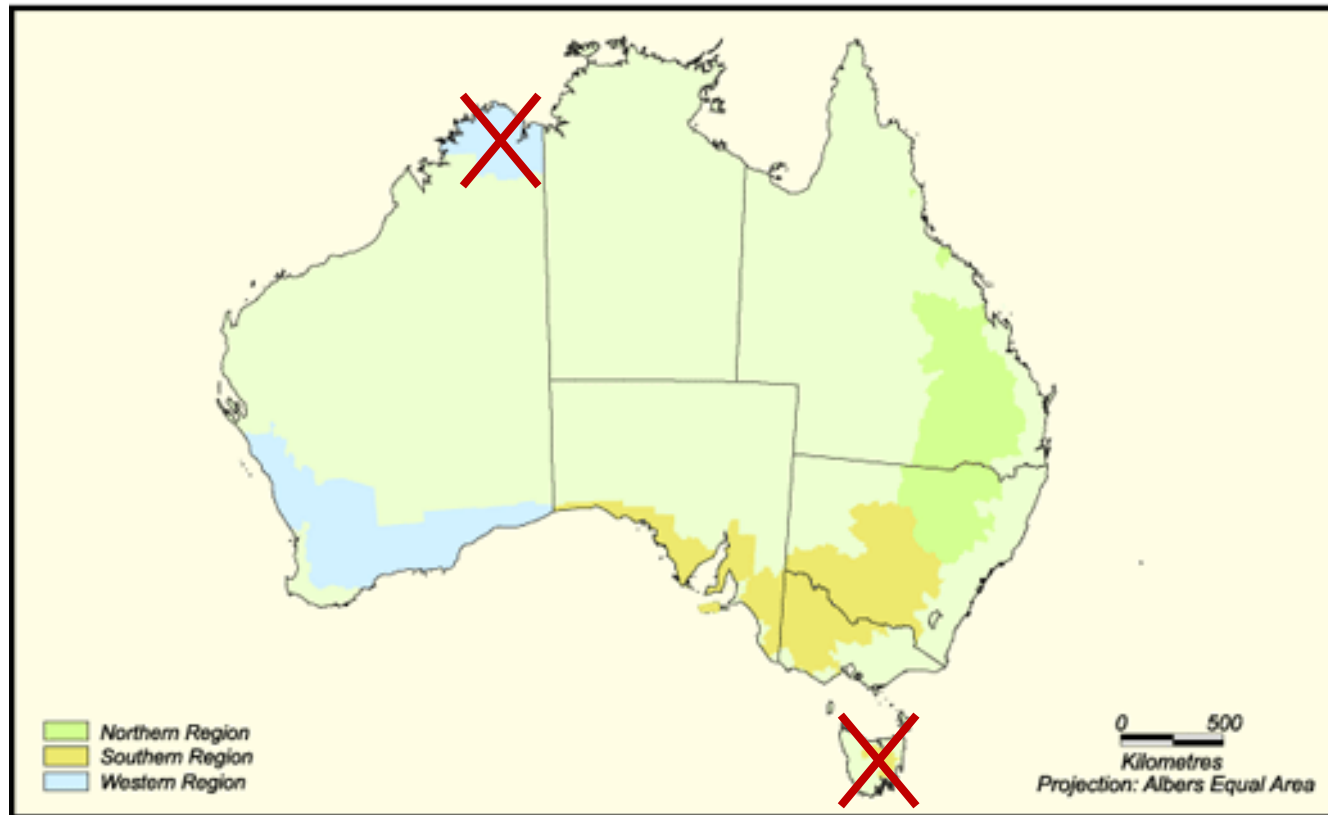
4 nights' catch, May 1917, Lascelles, Victoria

We need to:

- detect early-stage build-up of mouse populations
- forecast outbreaks

Surveillance and forecasts for very large areas

Grains Map

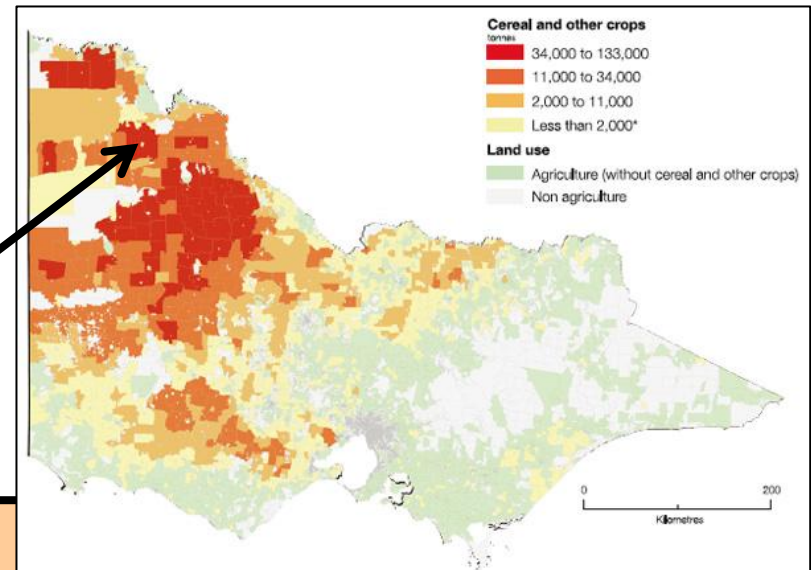


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Australian Natural Resources Atlas

Existing forecast models are based on intensive, localised research

Grain production in Victoria
Department of Primary
Industries, Victoria

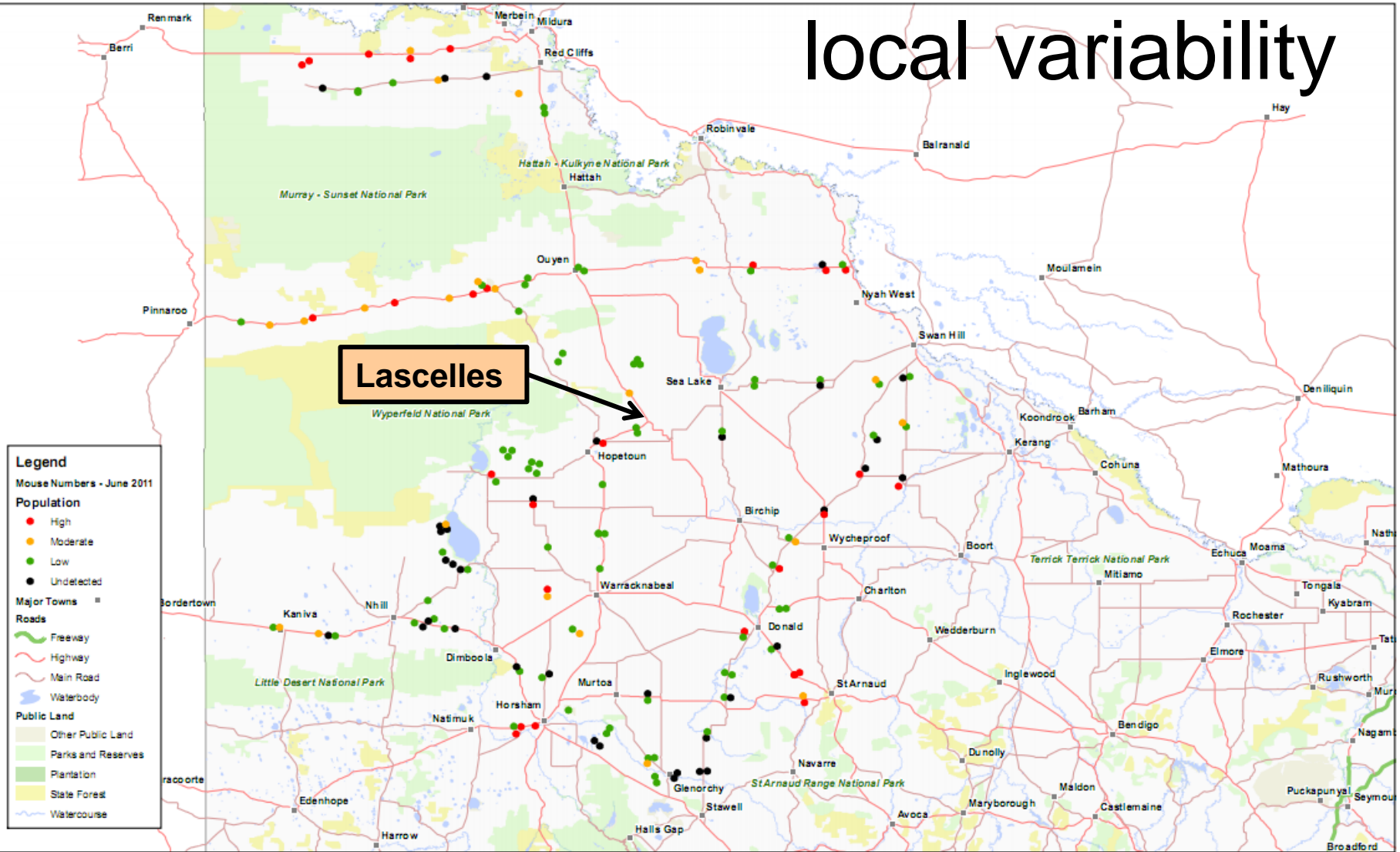


The 'famous Kenney model':

$$\text{Logit}(Y) = 2.7325 - 0.0277 (\text{November rain}) - 0.00780 (\text{May to September rain})$$

$$\text{Prob}(\text{outbreak}) = 1/[1 + e^{\text{logit}(Y)}]$$

Existing models do not describe local variability



Mouse Numbers - 22 - 28 June 2011

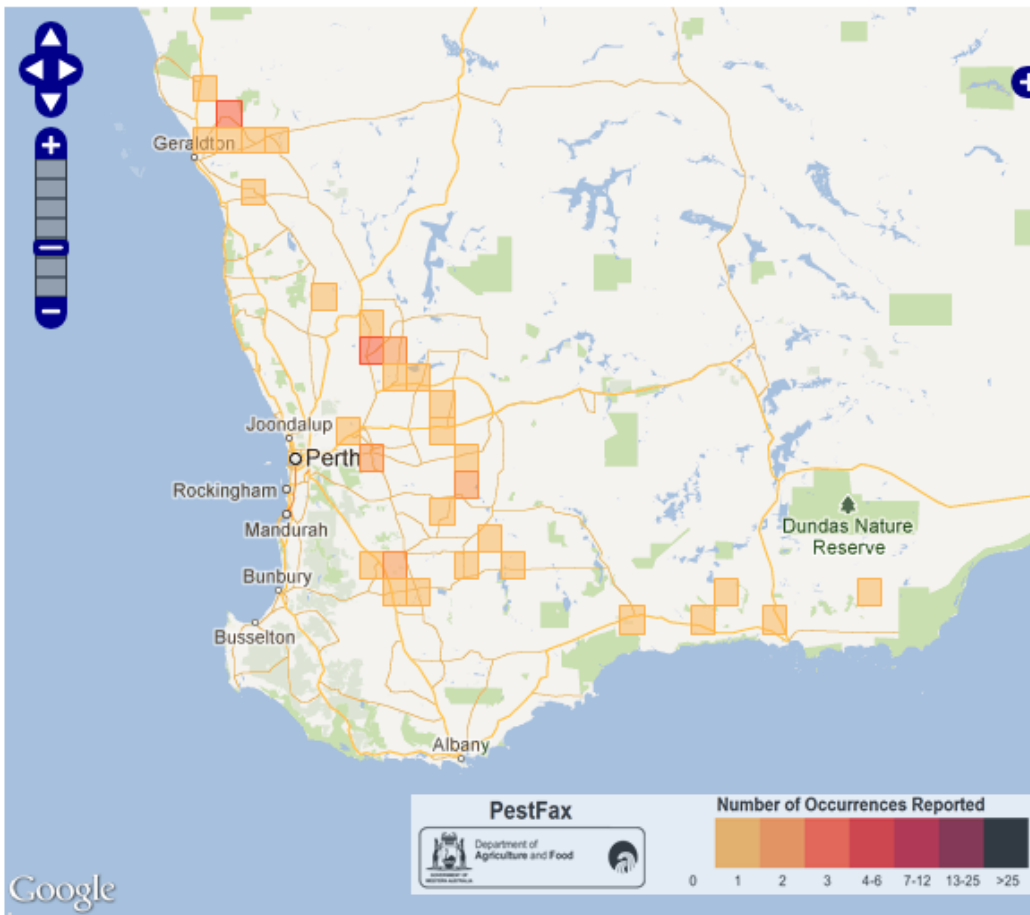


General Enquiries: +61 8 9368 3333 | PaDIS: 1800 084 881

You are: Home > Plant Health > Plant Health information > Post-border biosecurity > PestFax Map

PestFax Map

Choose a host, a disorder and a time period using the controls to the right of the map.



[Make an on-line report](#)

Host:

Category:

Disorder:

TIME PERIOD

2

End Date:

Click on a map cell to list occurrences



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PestFax Map

Choose a host, a disorder and a time period using the controls to the right of the map.

[PestFax Newsletter](#) [Home View](#) [Feedback](#) [Share](#)

[Make an on-line report](#)

Host:

Category:

Objectives:

- collect local information at the right times
- analyse data ‘on the fly’
- provide useful feedback

Google

Department of Agriculture and Food

Grains Research & Development Corporation

THE UNIVERSITY OF WESTERN AUSTRALIA
A Leading University

Solutions:

1) local information at the right times



Help map feral animal sightings in your area - **Get involved!**

Select a feral animal to get started



RabbitScan



CamelScan



FoxScan



FeralPigScan



MynaScan



ToadScan



FeralGoatScan



FeralFishScan



WildDogScan



DeerScan



StarlingScan

CITIZEN SCIENCE

WHERE **YOU** HELP MAP FERAL ANIMALS
AND THE DAMAGE THEY CAUSE

A LANDHOLDER, COMMUNITY, INDUSTRY, GOVERNMENT
& BUSINESS COLLABORATION

Partners



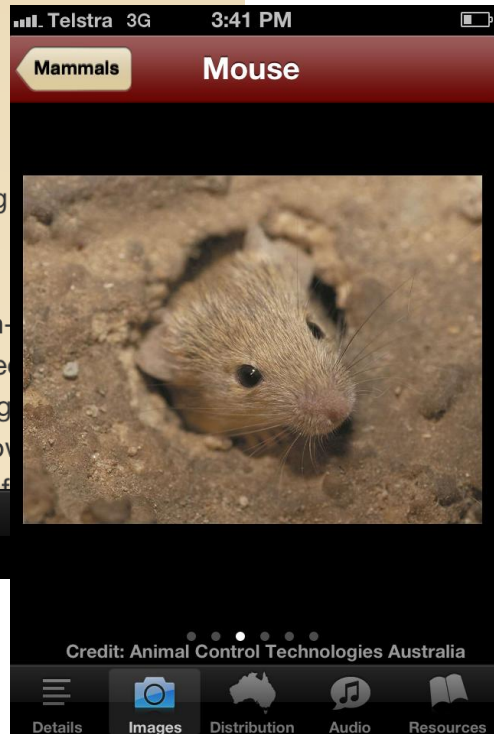
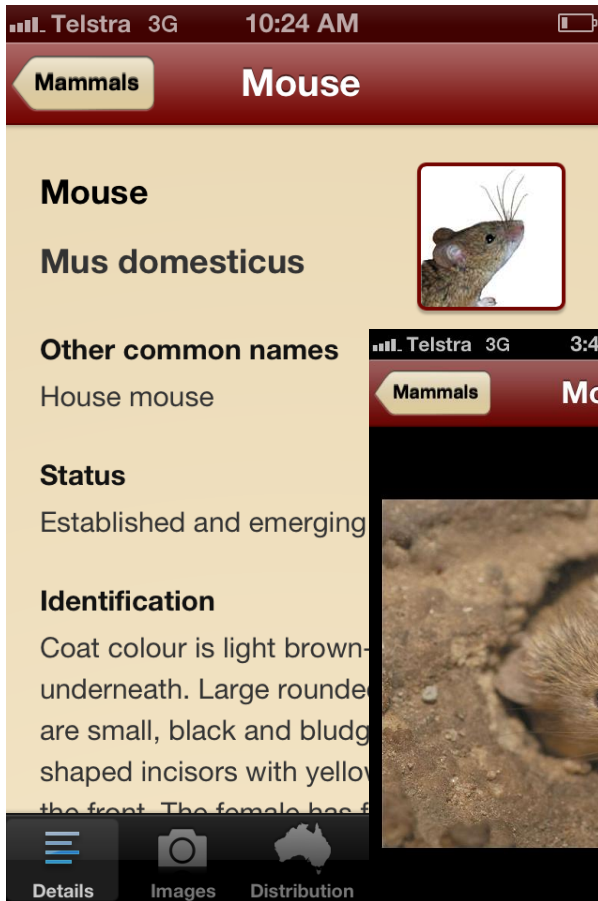
Supporters



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Smartphone apps

Real-time data capture



Solutions:

1) local information at the right times

The '3 (or 4) questions rule'. For example, elicit this information in autumn:

For your property,

- 1) Have you seen mice recently?
 - None
 - Low: few around
 - Medium: patchy, moderate
 - High: widespread and obvious
- 2) Will you use bait now?
 - Yes/no
- 3) What rate of application will you use?
- 4) What area will you bait?

Solutions:

2) scientifically usable information

Model the 'observation process':

'conventional' field data

vs.

'citizen science' data



small teams with specialist skills

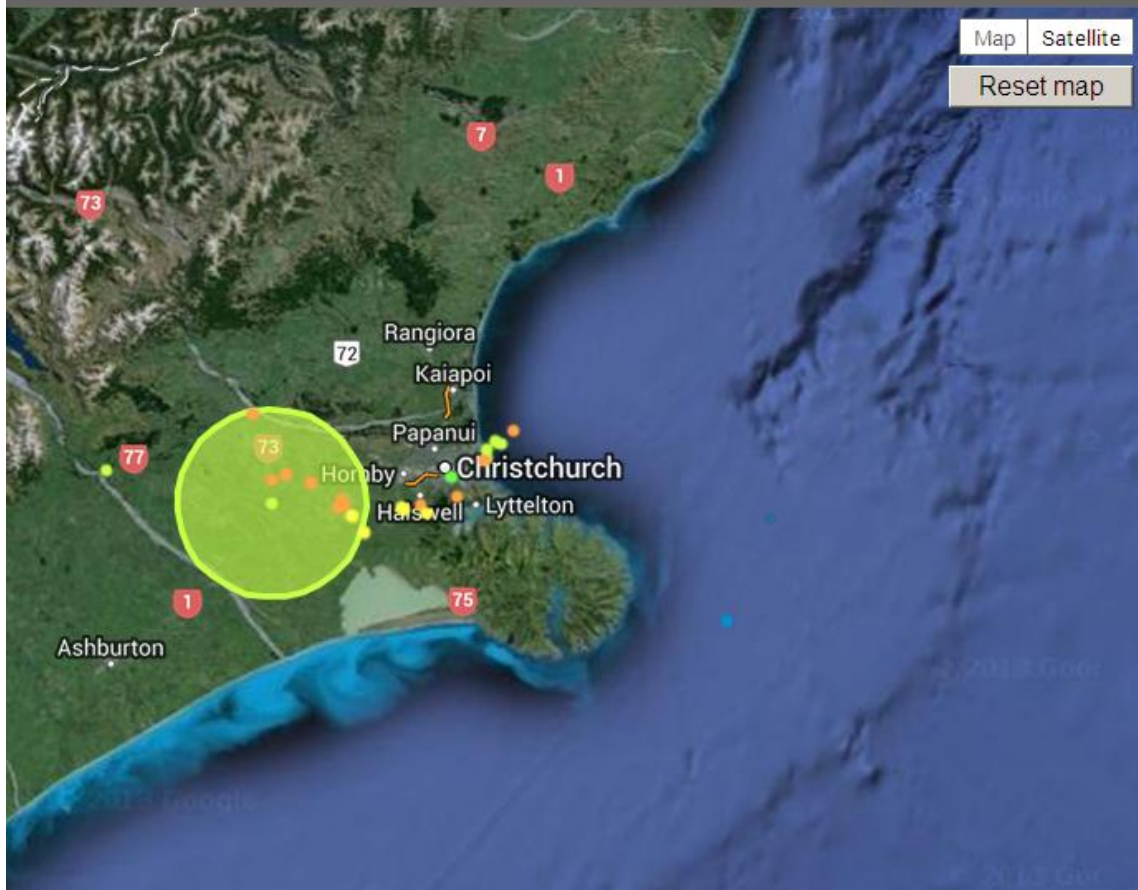


lots of people with variable skills

Solutions: 3) rapid feedback

Christchurch Quake Map

[Home](#) [Other Maps](#) [Daily Energy Release](#) [FAQs / Help](#) [About](#)



Latest quakes

Move your mouse over a quake below to view it on the map, or click on one to zoom to its location.

Mag	Depth	Date	Time
2.8M	6km	1/9/2013	15:23
2.5M	5km	1/9/2013	04:34
2.5M	8km	31/8/2013	22:52
4.3M	10km	31/8/2013	08:01
2.1M	7km	30/8/2013	20:44
2.4M	5km	30/8/2013	15:45
2.4M	10km	29/8/2013	22:55
2.9M	70km	29/8/2013	14:40
3.2M	5km	29/8/2013	14:16
2.4M	15km	29/8/2013	07:04
2.4M	6km	29/8/2013	05:05
2.3M	9km	28/8/2013	17:31
2.5M	12km	28/8/2013	13:37
2.3M	9km	27/8/2013	22:56
2.7M	8km	27/8/2013	20:30
2.7M	5km	27/8/2013	18:54

Solutions: 3) rapid feedback



Help map feral animal sightings in your area - **Get involved!**

Select a feral animal to get started



Create a map of Rabbits in your area

You can create a map showing all the rabbit records in your local area or create a map of your data including damage and control records. Use this information to plan rabbit control activities and work in unison with your neighbours.

[Create a map >](#)

FeralGoatScan

FeralFishScan

WildDogScan

DeerScan

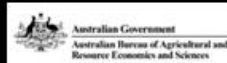
StarlingScan

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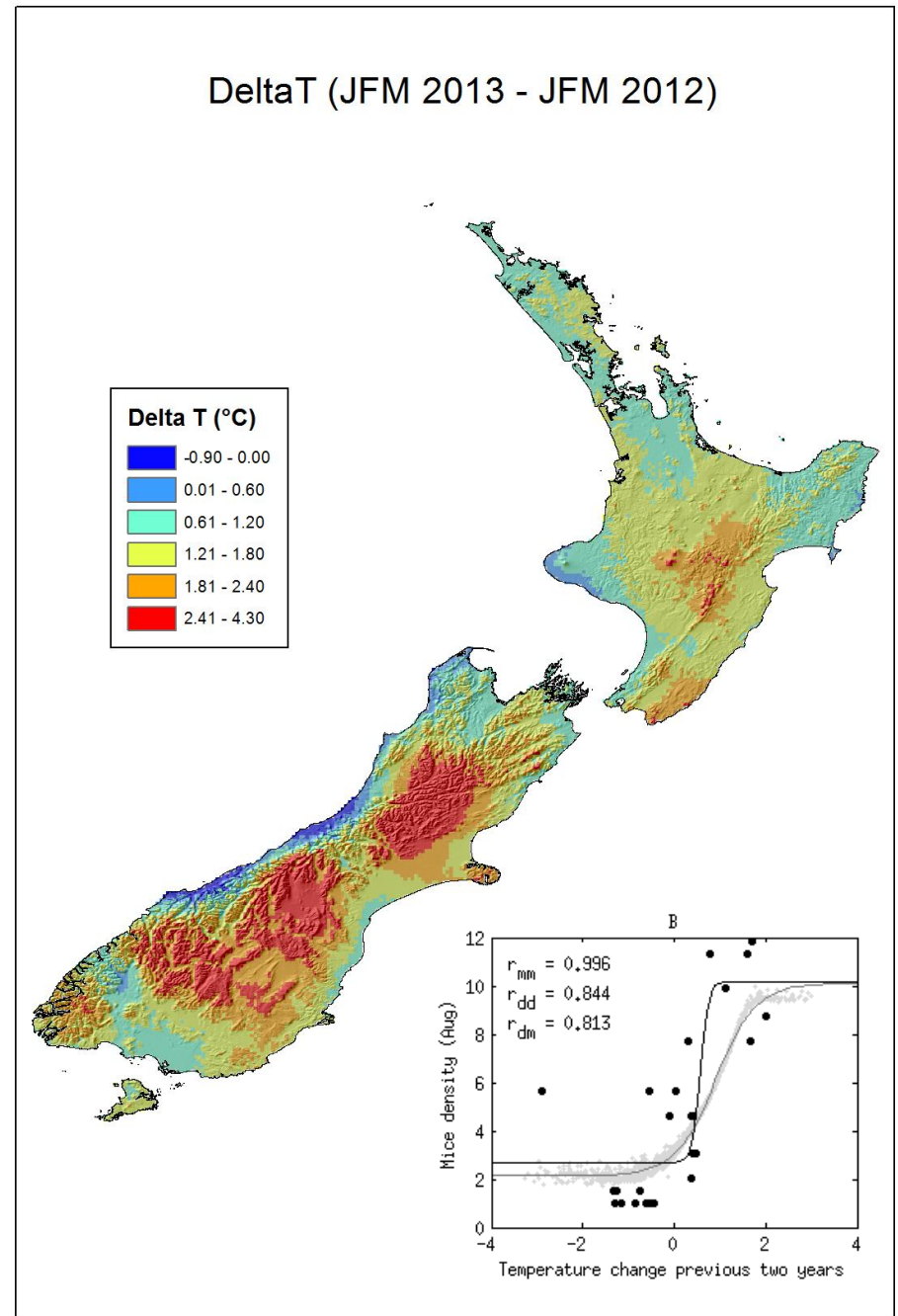


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Solutions:

4) automatic forecasting

ΔT -based forecasts for
masts (& rodent outbreaks)
available early April each
year



Citizen science: research needs

- 1) local information at the right times
- 2) scientifically usable information
- 3) rapid feedback
- 4) automatic forecasting

Citizen science – an essential part of surveillance (and forecasting)

People place high value on:

- Their own ideas
- Reward for effort
- Local knowledge
- Products that include their own contributions

