Marine toxoplasmosis: from cat poo to kai moana?

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IDReC

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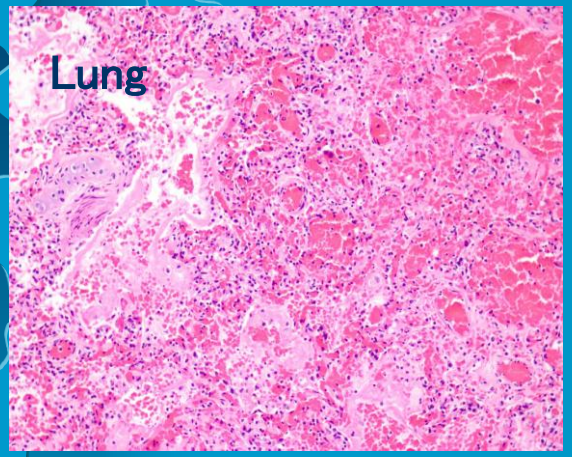
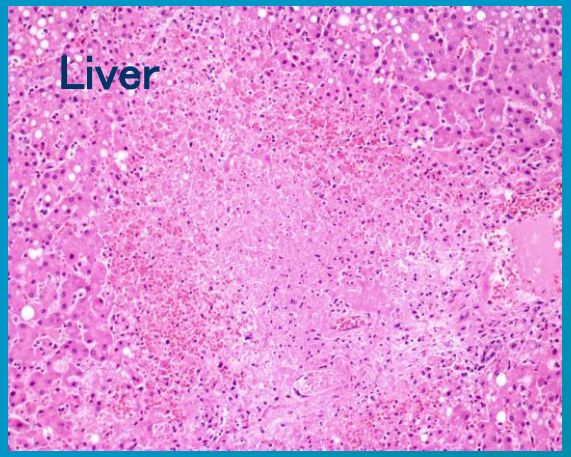
WILDBASE RESEARCH

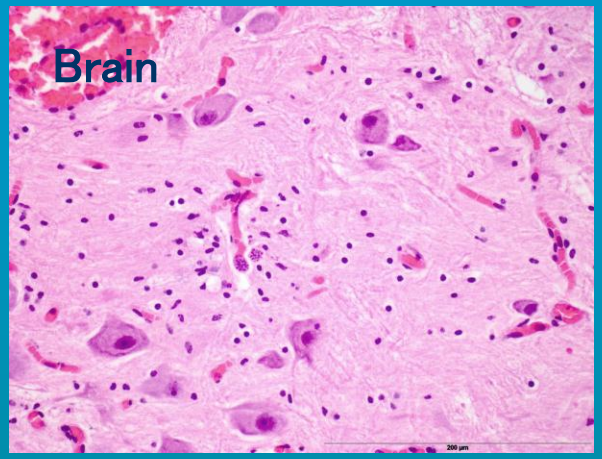
Hector's dolphin mortalities

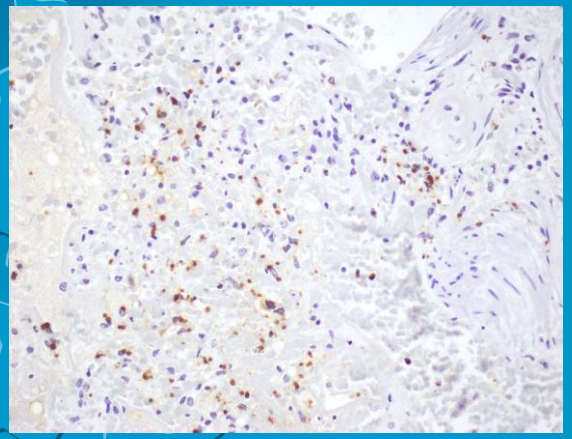
- 2007 to 2011
- 28 dolphins
  - 7/28 (25%) died of toxoplasmosis
  - 17/28 (63%) dolphins positive on PCR

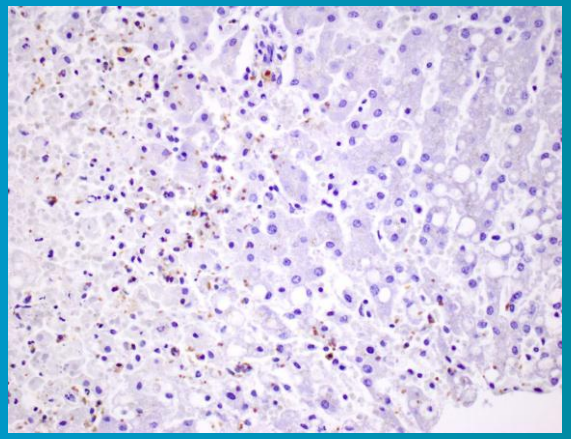
Histology – H&E

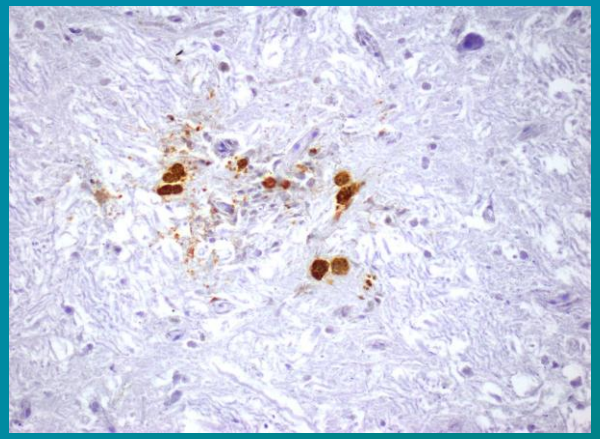




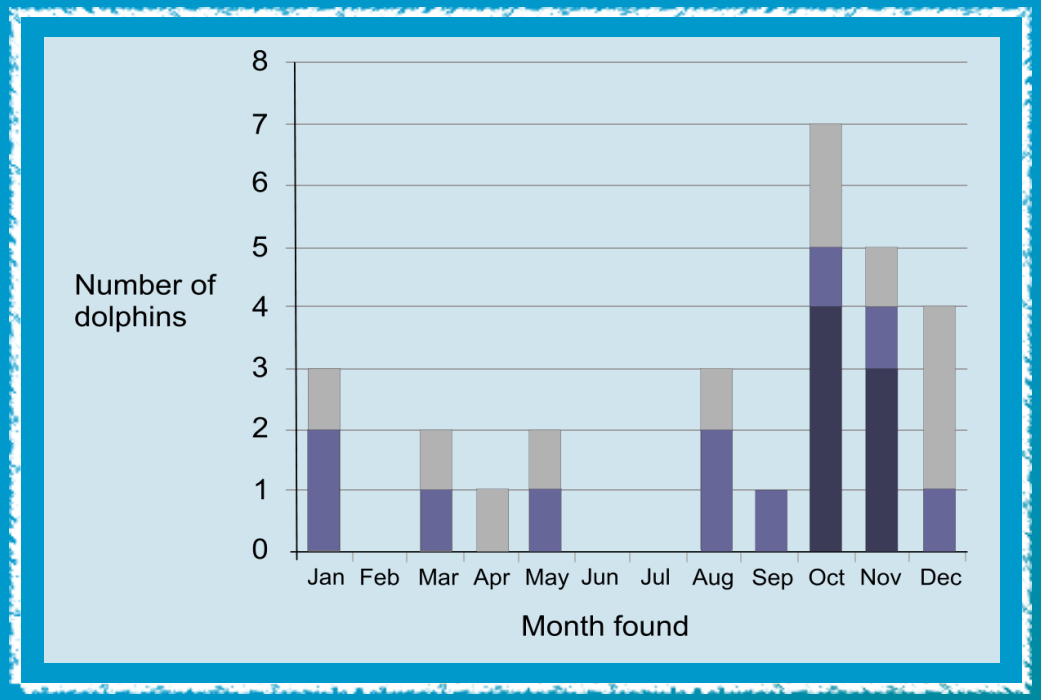






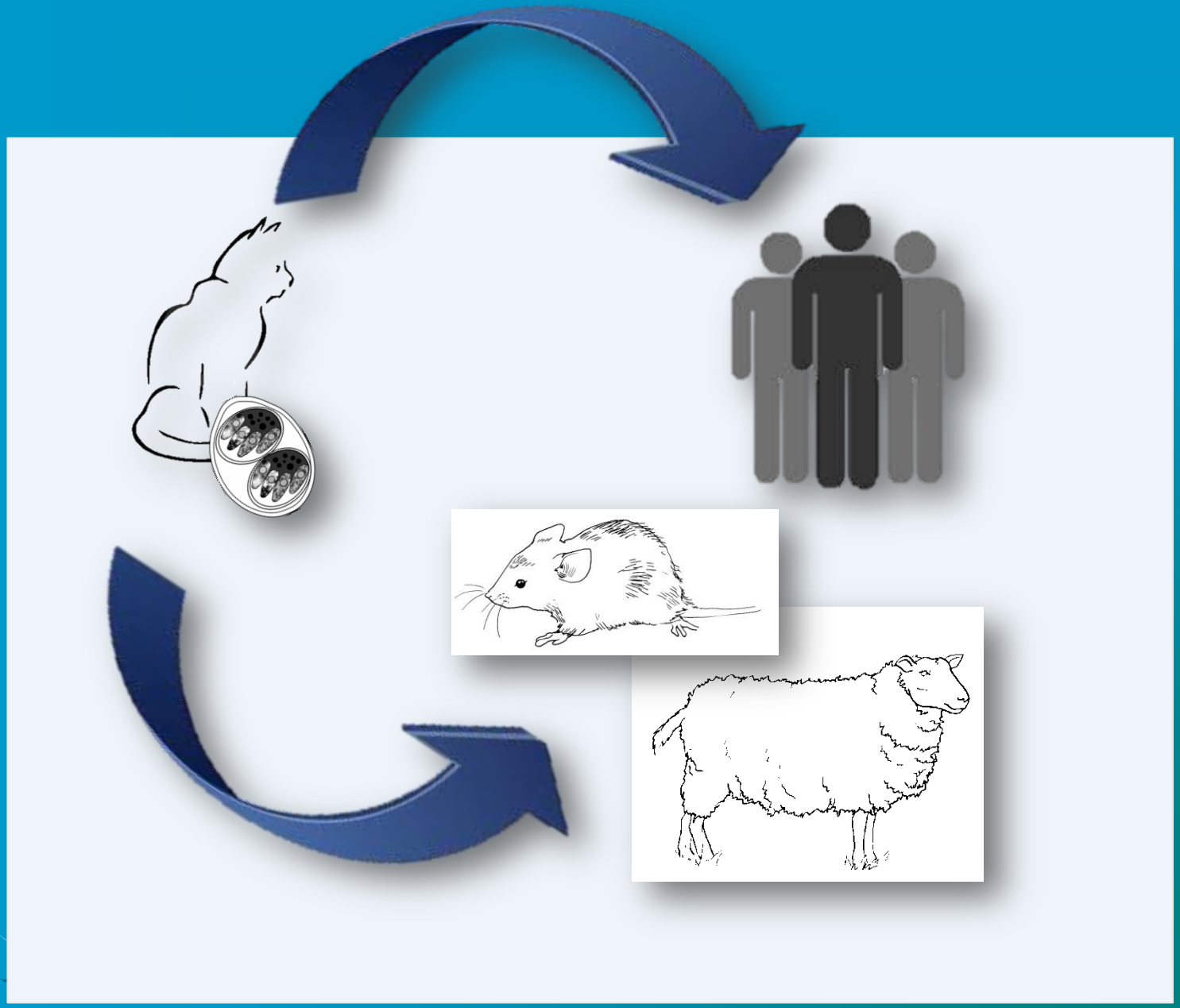


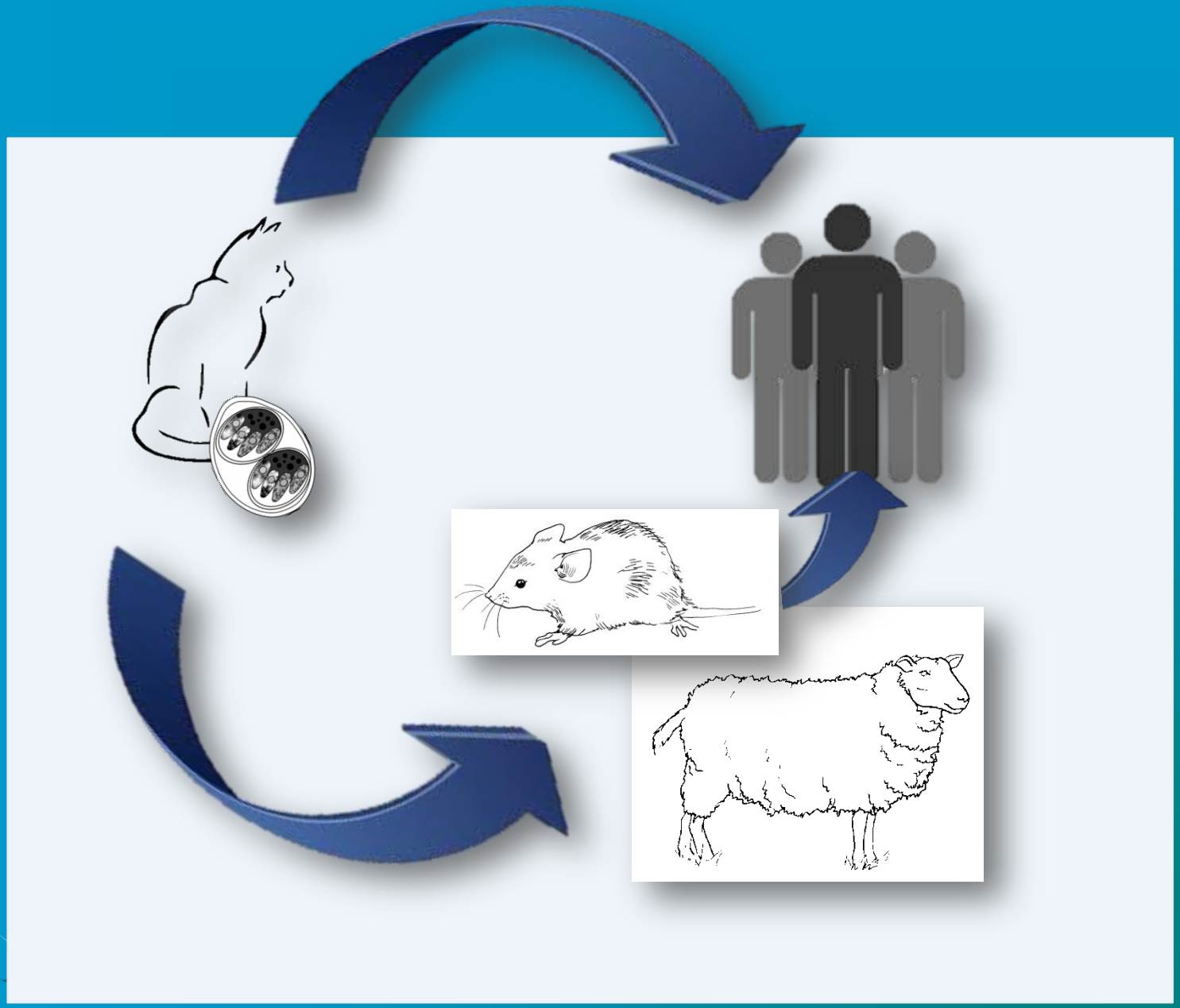
Immunohistochemistry



No. examined
PCR positive
fatal disseminated disease

- all fatal cases found in October or November
- 7/8 isolates were **atypical type II genotype**





Human toxoplasmosis:

- often subclinical or mild infection
- severe illness if immunosuppressed
- congenital ophthalmitis or stillbirth if infected *in utero*
- linked to suicide and psychiatric illness

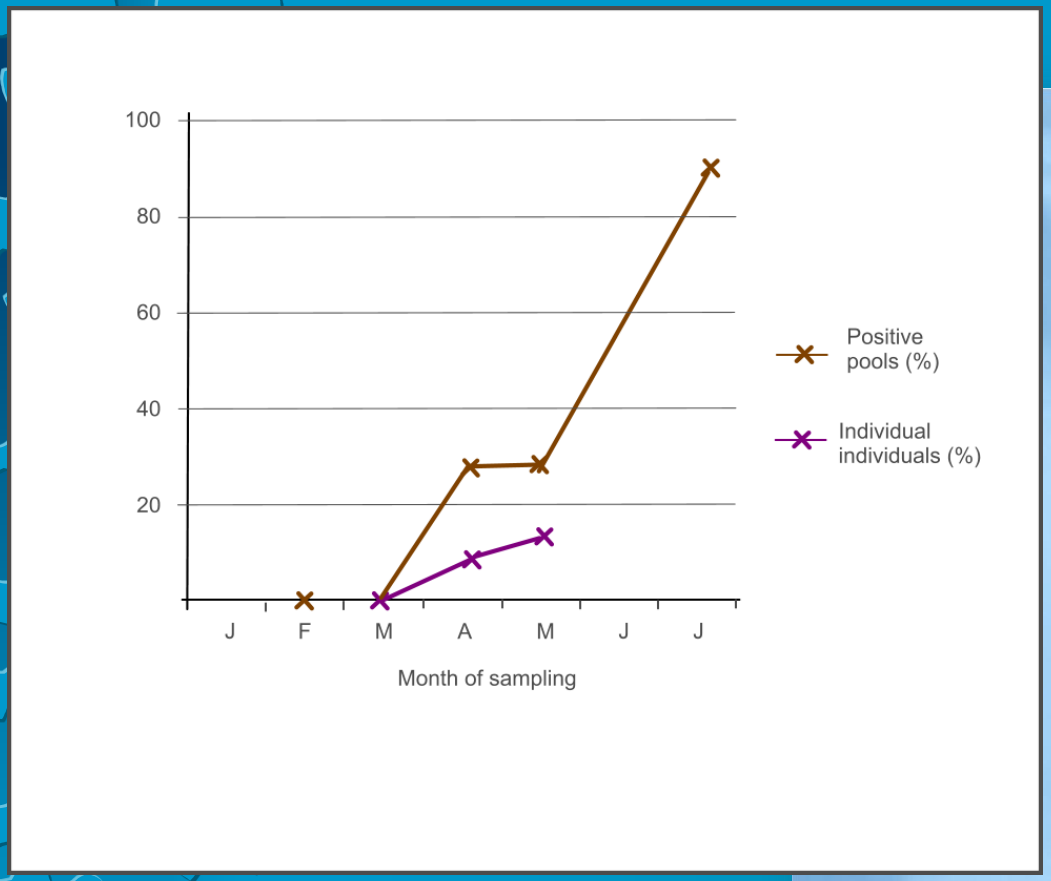
1. Marine environmental contamination

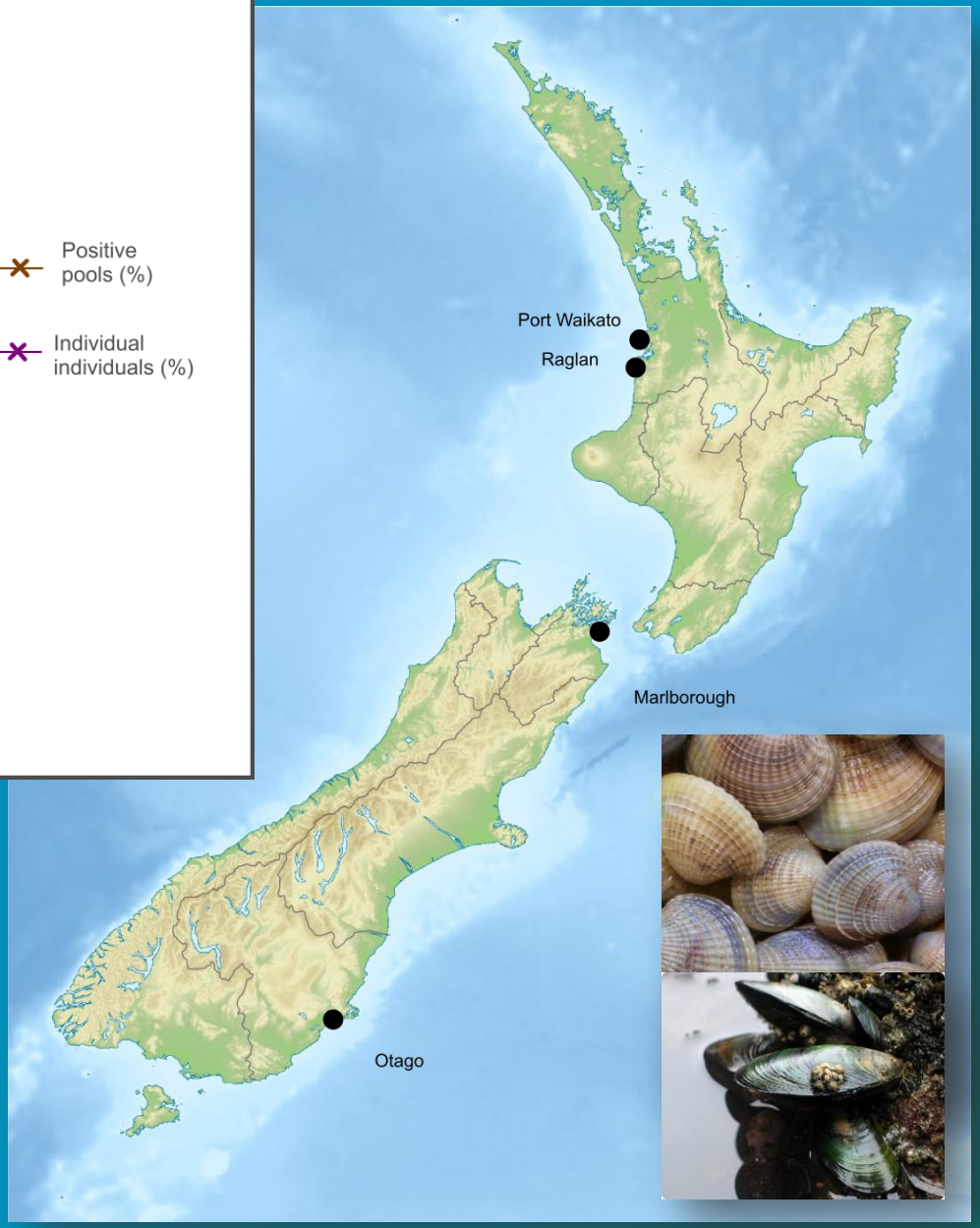
Shellfish – vectors & indicators

- Maui's dolphins
  - critically endangered
  - 55 remaining
  - North Island only
  - 3 in case series
  - 2 died of toxoplasmosis

Coastal shellfish

- Pilot study:
  - supermarket mussels
  - expected prevalence – 1 per 100 - 300
  - 12/44 (27%) toxoplasma positive on PCR


100
80
60
40
20
J
F
M
A
M
J
J
Month of sampling
Positive pools (%)
Individual individuals (%)

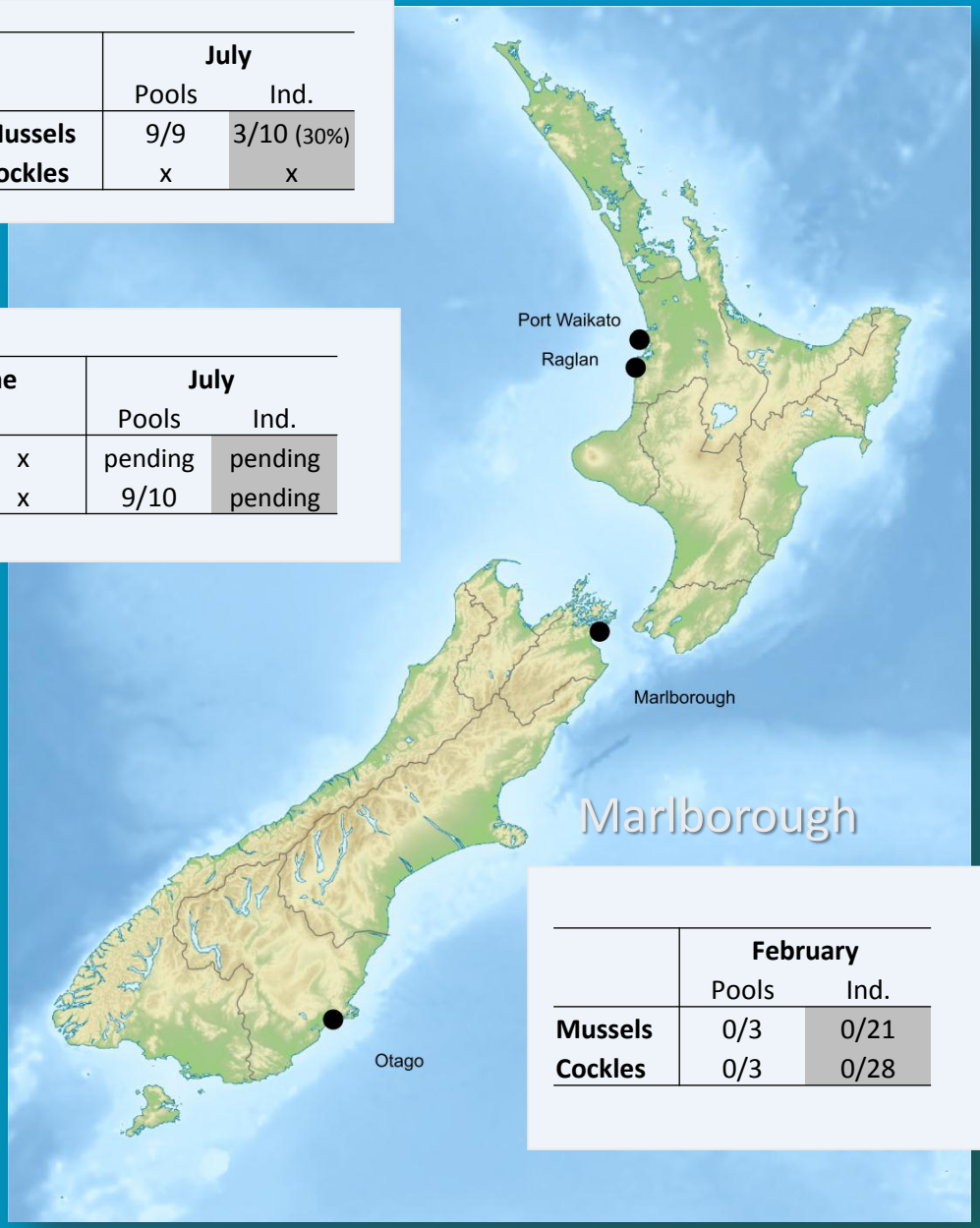

Port Waikato
Raglan
Marlborough
Otago

Port Waikato:

	July	
	Pools	Ind.
Mussels	9/9	3/10 (30%)
Cockles	x	x

Raglan:

	April		May		June	July	
	Pools	Ind.	Pools	Ind.		Pools	Ind.
Mussels	4/7	13/55 (24%)	5/10	15/89 (17%)	x	pending	pending
Cockles	1/9	3/88 (3%)	5/28	14/280 (5%)	x	9/10	pending



Otago:

	March	
	Pools	Ind.
Mussels	x	x
Cockles	0/3	0/29

Marlborough

	February	
	Pools	Ind.
Mussels	0/3	0/21
Cockles	0/3	0/28

2. Source

Stray

Cat study

- 97 feral cats (DOC)
  - faecal float ..... 2 positive
  - PCR (whole faeces) ..... 40 positive (41.2 %)
- 31 SPCA cats
  - faecal float ..... 1 positive
  - PCR ..... 3 positive (9.6%)
- 14 stray
  - faecal float ..... 1 positive

3. Distribution of genotypes in New Zealand

4. Risk factor analysis

- concurrent disease/ immunosuppression
- infecting genotype
- diet
- season (rainfall, snow-melt, kittening)
- habitat characteristics
  - sediment type and loading
  - river outflow
  - catchment area
  - topography
  - estuarine category (flushing, mixing)

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Questions?