

One Health Approach to Freshwater Management



Elaine Moriarty
13th Dec 2017



John Snow memorial and public house on Broadwick Street, Soho



The Cow-Pock — or — the Wonderful Effects of the New Inoculation! — Vide. the Publications of the Anti-Vaccine Society.

Te Pae Mahutonga

The Southern Cross Star Constellation brings together elements of modern health promotion.



Mauniora
Cultural identity



Waiora
physical environment



Te Oranga
participation in society



Ngā Manukura
leadership



Te Mana
Whakahaere
autonomy



Toiora
healthy lifestyles

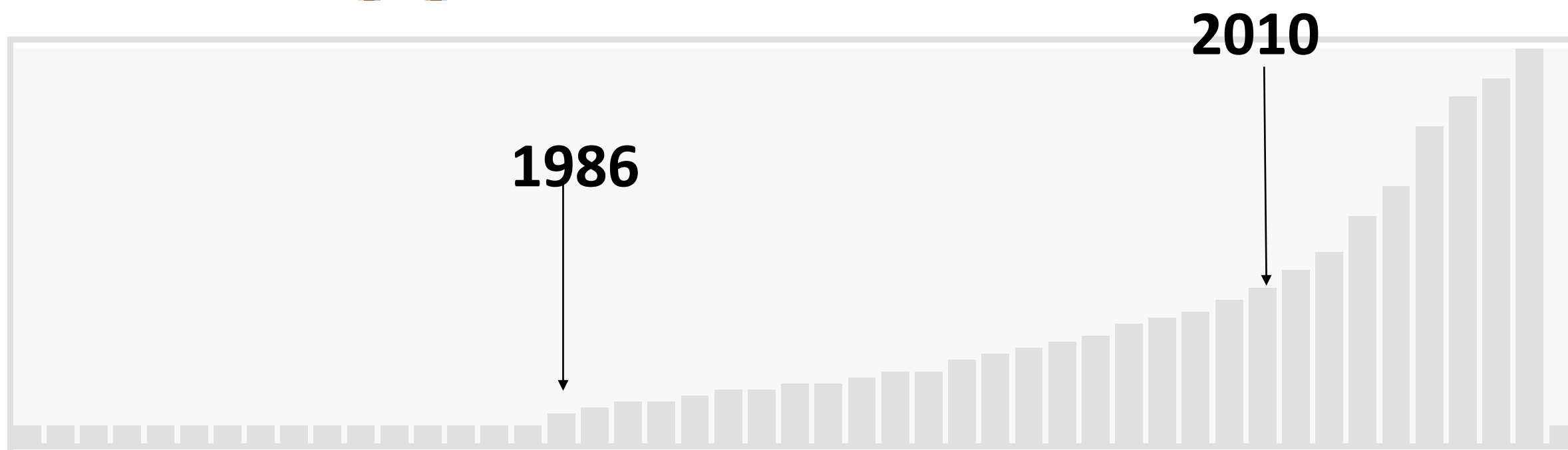
Why are Zoonoses Important ?

- Of all human pathogens, 60% are zoonotic.
- Approximately 75% of all recent emerging infectious diseases of human concern are of animal origin.



*Only the dog knows
the truth...*

Results by year



One Medicine, One Health



River



Awa

Ki uta ki tai



Microbial One Health Approach to Freshwater Management



Environment Southland





Comparison of PCR Binary Typing (P-BIT), a New Approach to Epidemiological Subtyping of *Campylobacter jejuni*, with Serotyping, Pulsed-Field Gel Electrophoresis, and Multilocus Sequence Typing Methods[∇]

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Same-Day Subtyping of *Campylobacter jejuni* and *C. coli* Isolates by Use of Multiplex Ligation-Dependent Probe Amplification–Binary Typing

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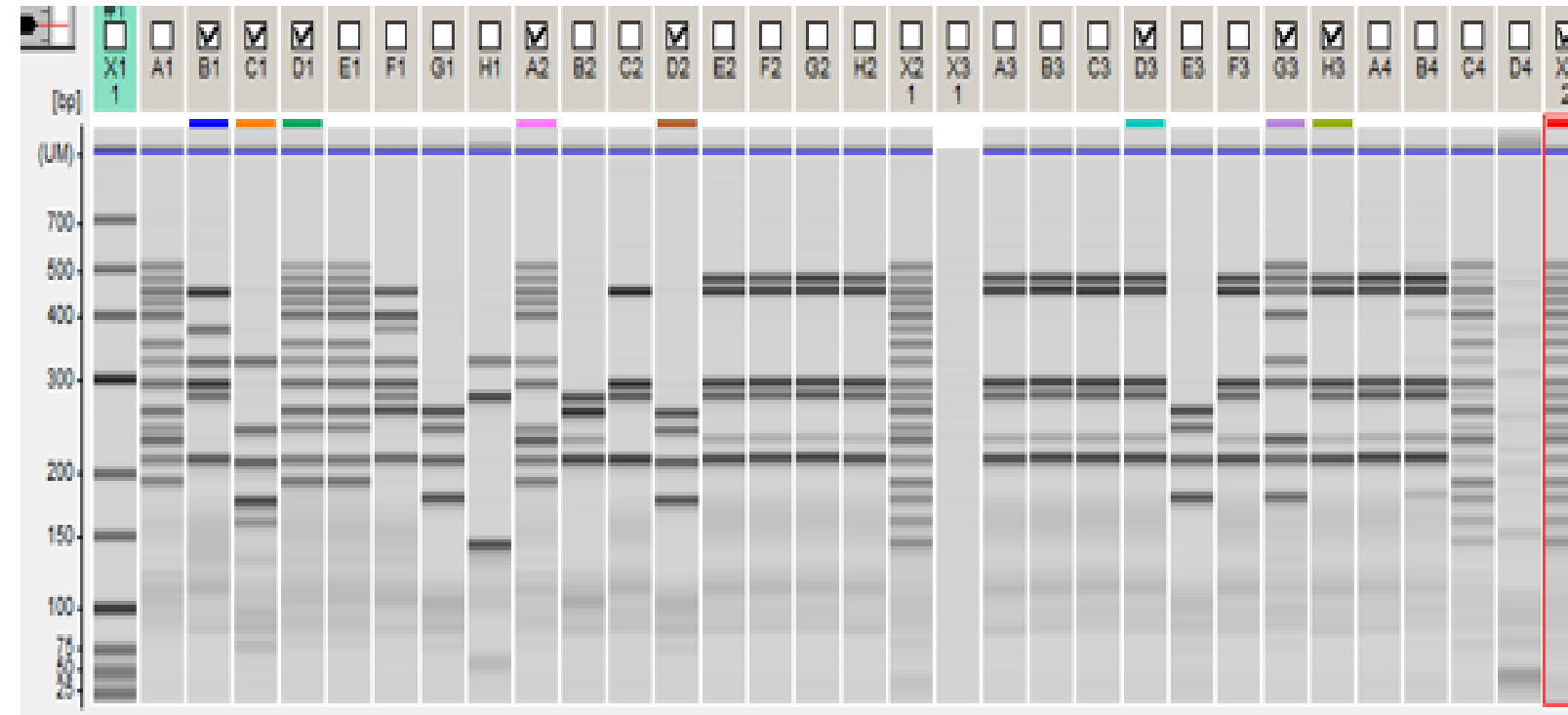
Campylobacter is a leading cause of infectious diarrhea. Subtyping methods require specialized equipment and are not available in many developing countries. We developed for subtyping of *C. coli* and *C. jejuni* a multiplex ligation-dependent probe amplification (MLPA)–binary typing (MBiT) method. The MBiT method was evaluated using 10 *C. coli* and 10 *C. jejuni* isolates. The MBiT method was compared with serotyping, pulsed-field gel electrophoresis (PFGE), and multilocus sequence typing (MLST). The MBiT method was found to be a rapid and cost-effective method for subtyping *C. coli* and *C. jejuni* isolates.

	tetO	virB8	cgtA	Cj1136	panB	maf5	Cj1135	Cj0265	CJE1733	Cj0122	gmhA2	flgE2	CJE1500	Cj0423	wlaN	cfrA	Cj1321	Cj0008	MBiT
NCTC11168	0	0	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	073767
RM1221	0	0	0	0	1	0	0	0	1	1	1	0	1	0	0	1	0	0	024311
RM1864	0	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	621200

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Isolates from Water Samples

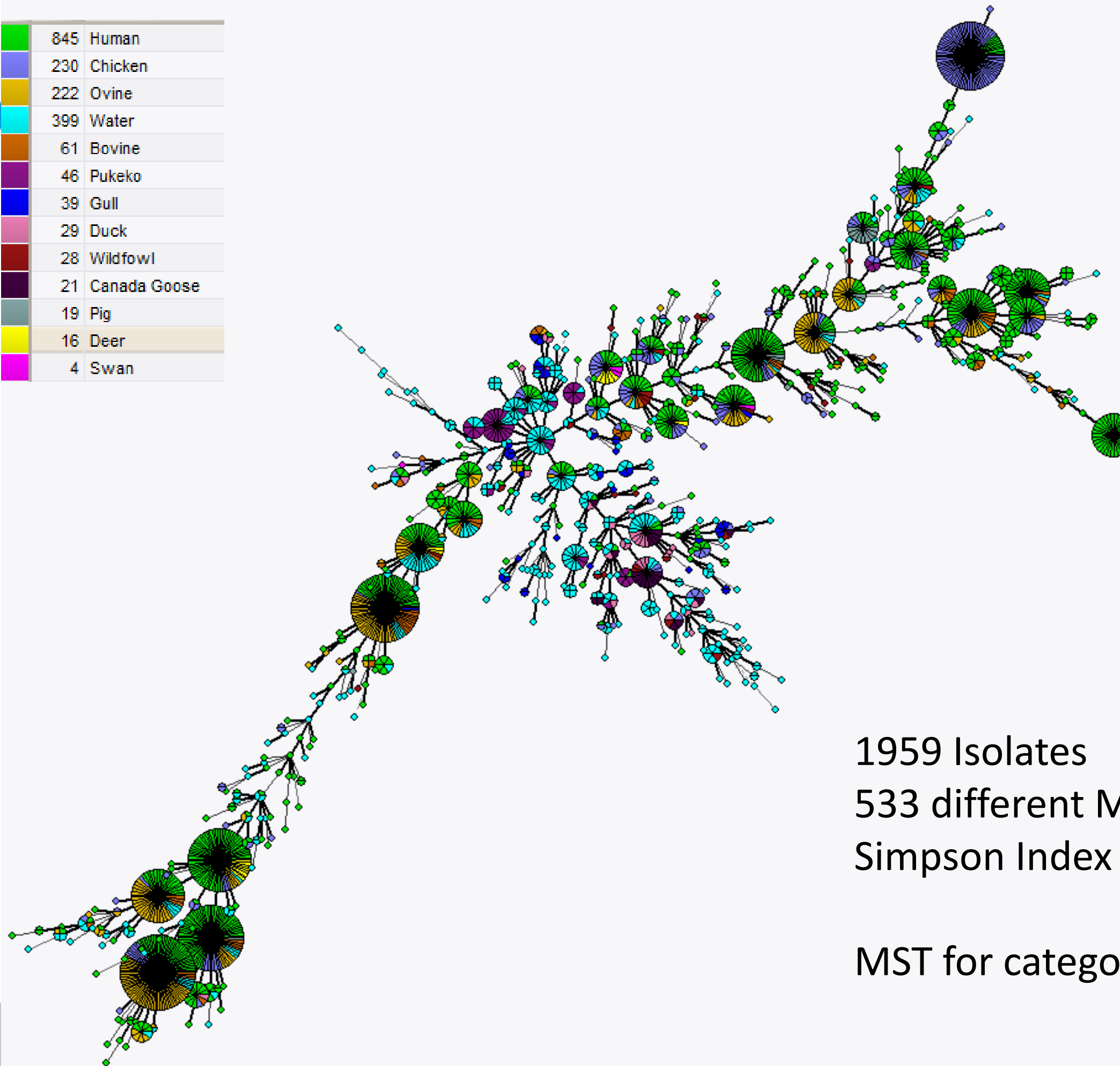
- Compare genotypes with those from human cases
 - are the types from water causing disease?
- Number of genes present indication of virulence
 - C. jejuni* from wildfowl tend to have less of MBit targets
- Assign possible source of campylobacter
 - Compare with library of isolates from known sources



1959

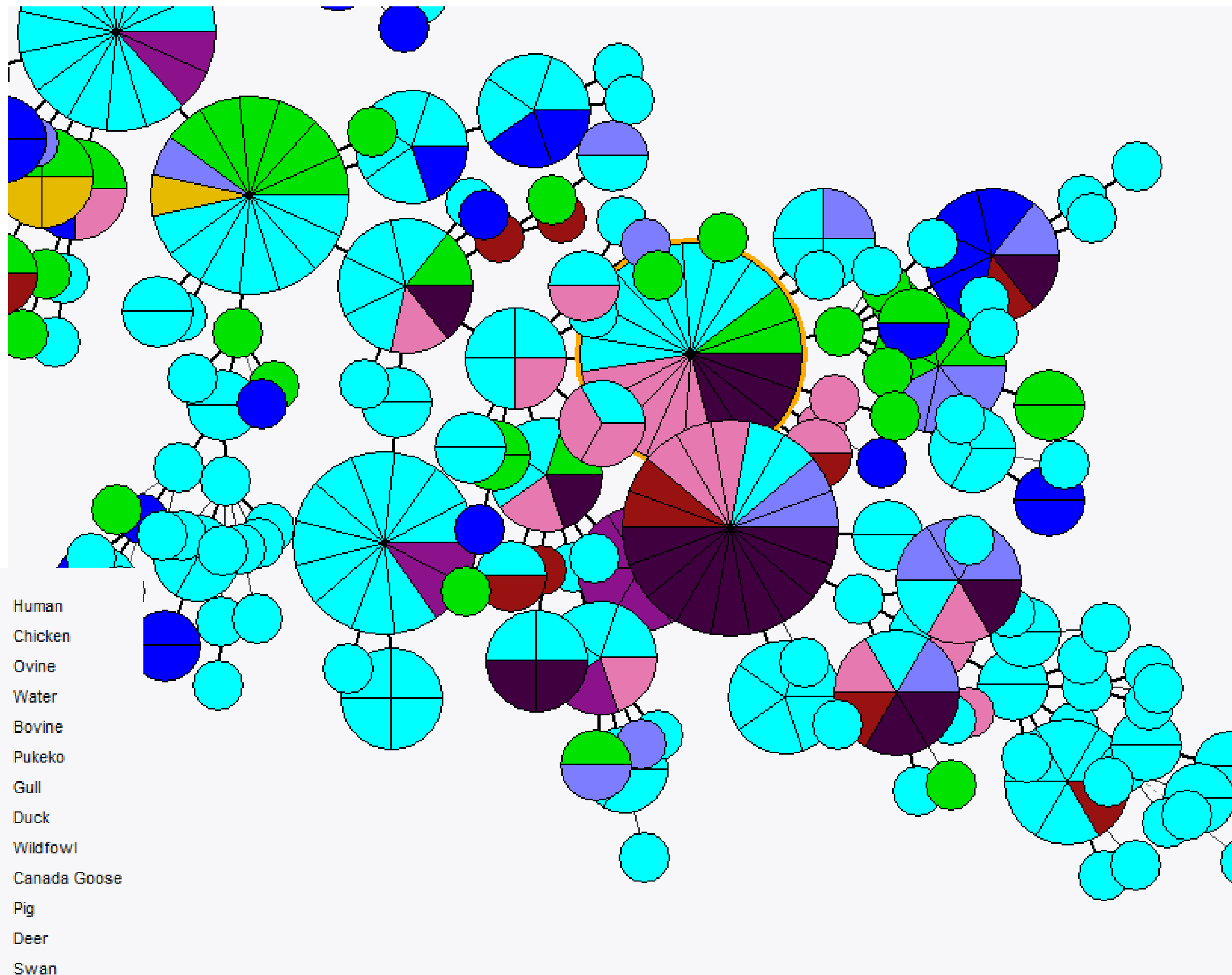
845	Human
230	Chicken
222	Ovine
399	Water
61	Bovine
46	Pukeko
39	Gull
29	Duck
28	Wildfowl
21	Canada Goose
19	Pig
16	Deer
4	Swan

Human
Chicken
Ovine
Water
Bovine
Pukeko
Gull
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Wildfowl
Canada Goose
Pig
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Swan

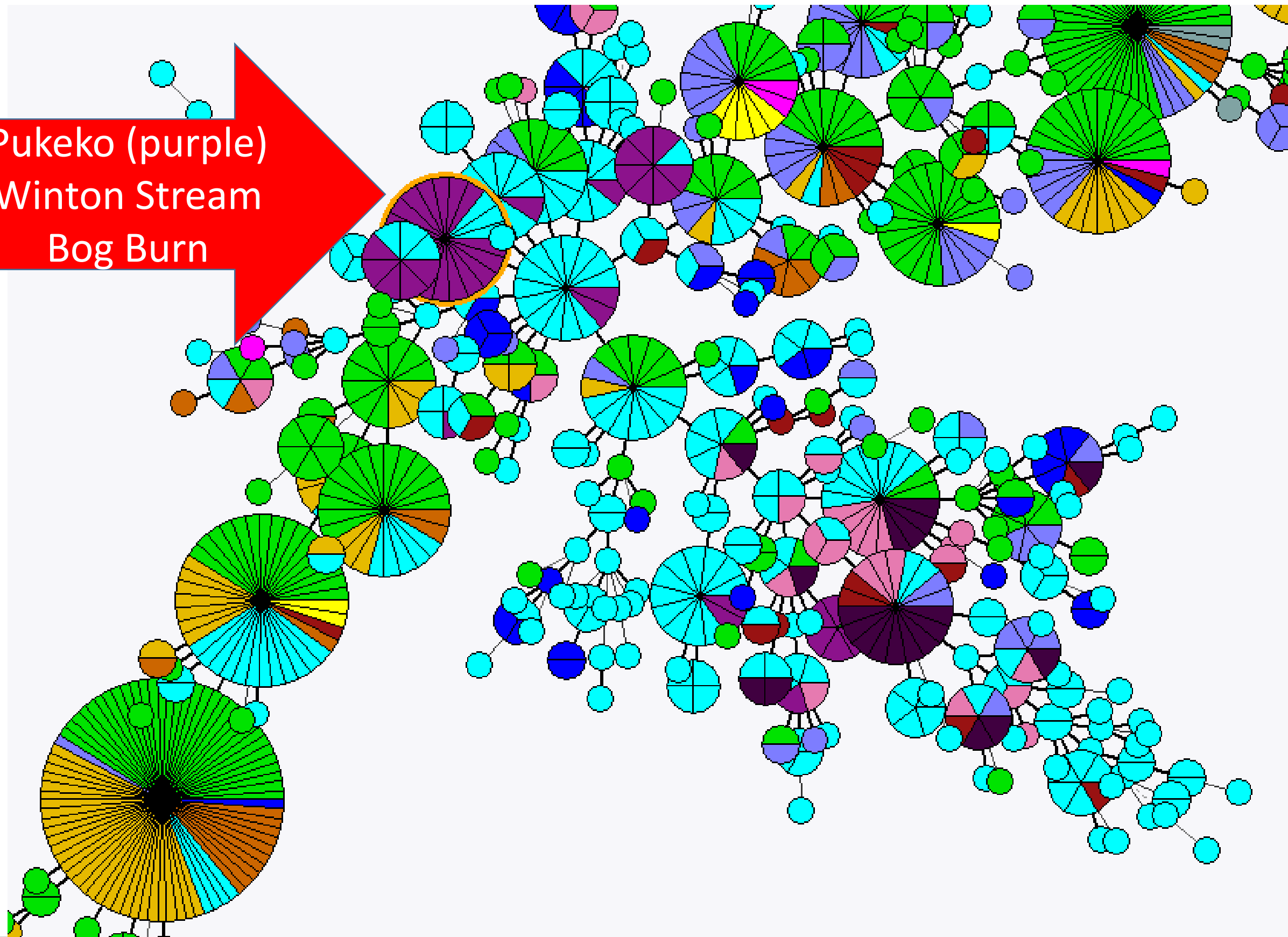


1959 Isolates
533 different MBiT patterns
Simpson Index 0.987

MST for categorical data



Pukeko (purple)
Winton Stream
Bog Burn

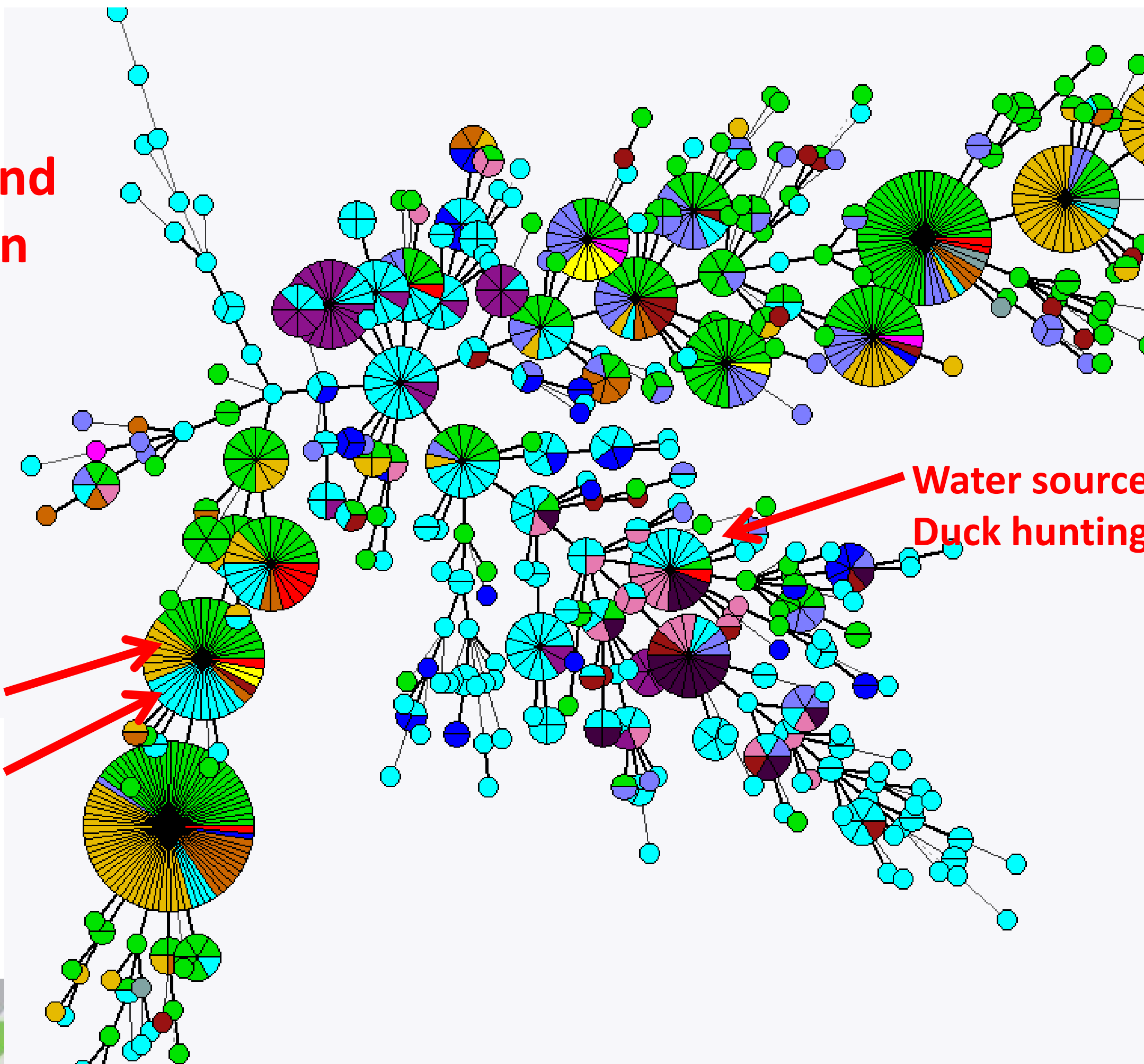


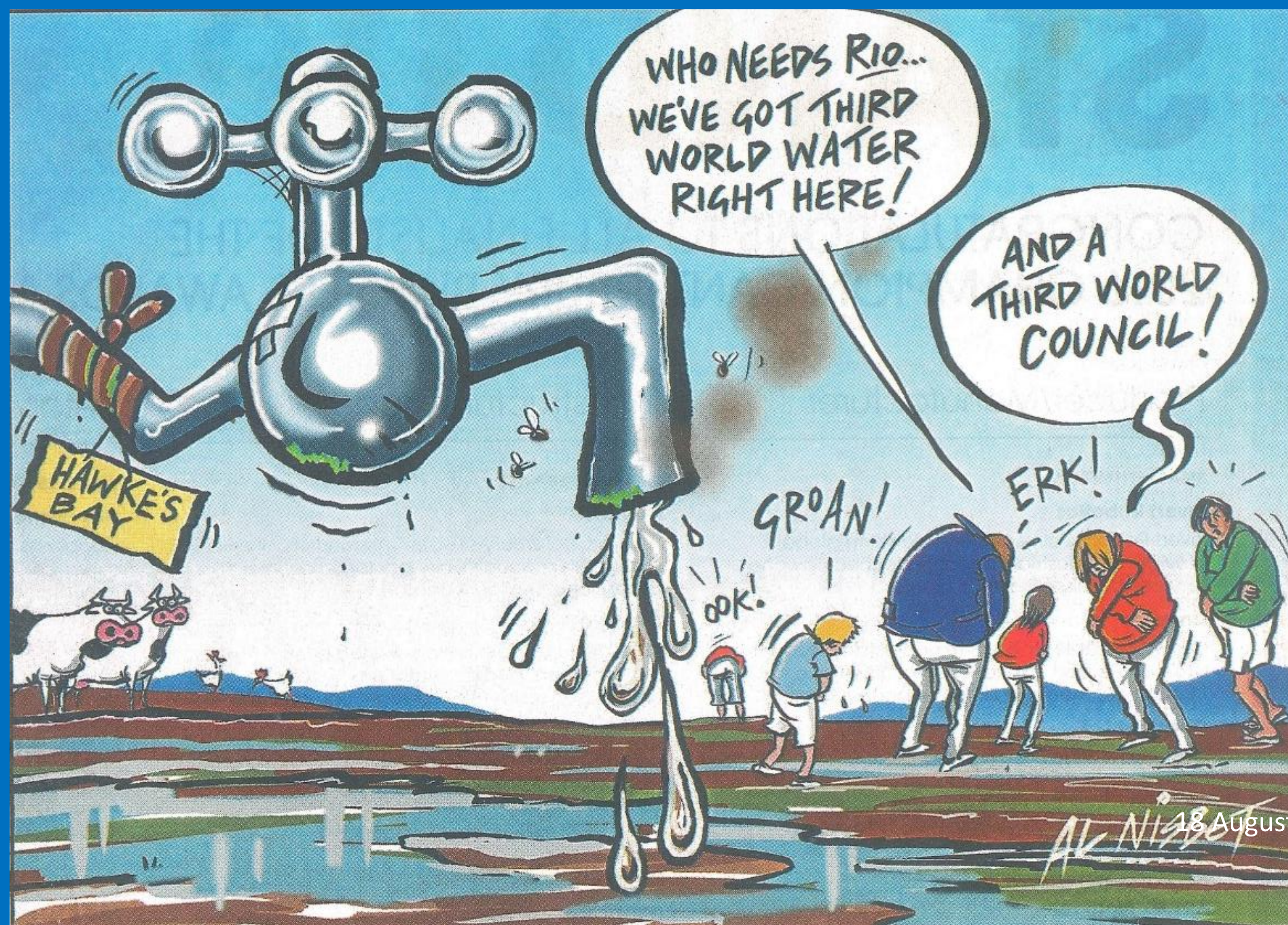
RED
Southland
Human



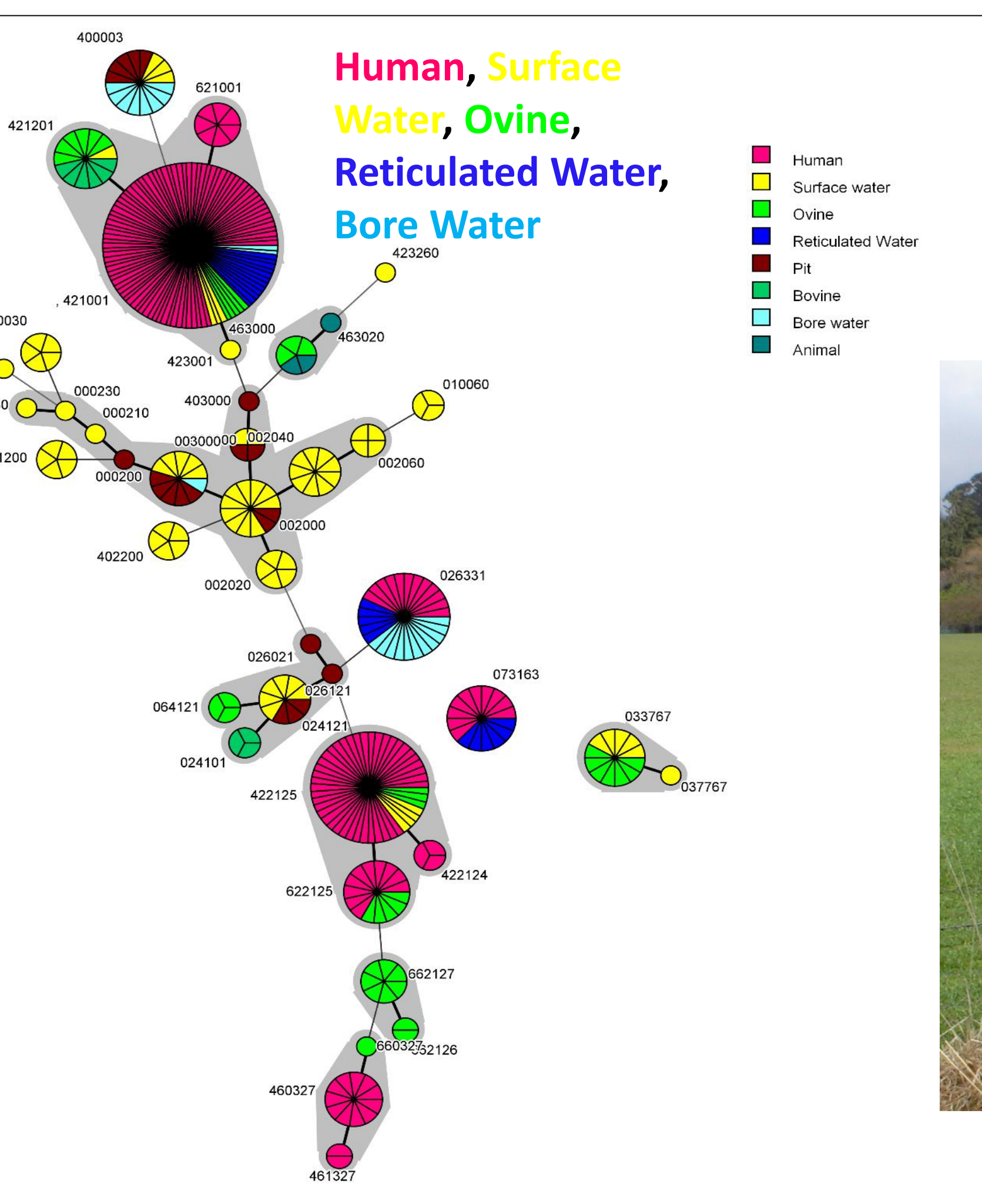
Ruminant
or
water
source

Water source?
Duck hunting?



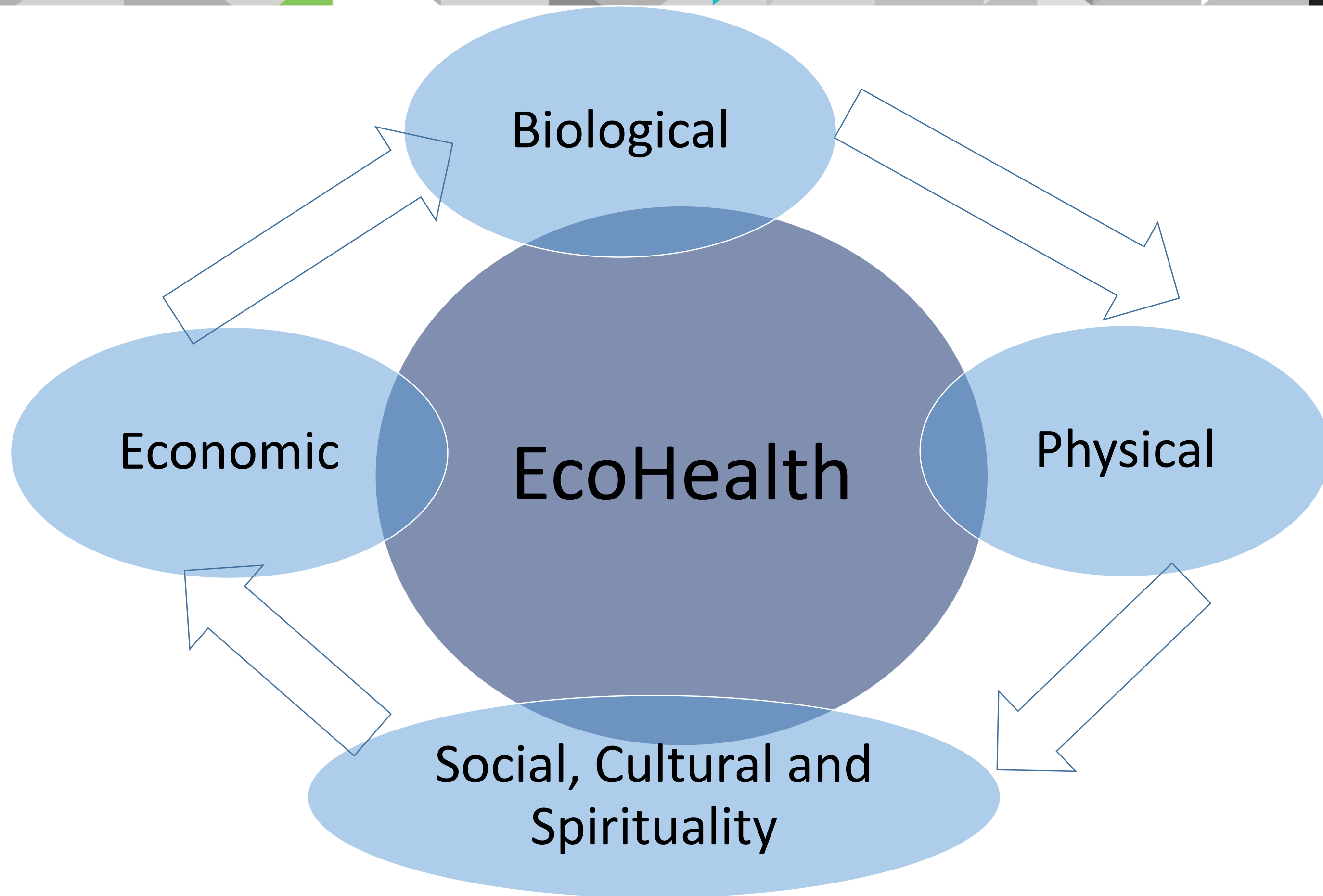


18 August 20





<https://teara.govt.nz/en/cartoon/18200/water-into-milk>



Social – Environment-Biological-Economic?

Stuff Home The Press News

Christchurch Mail Northern Outlook Schools Your Weather Christchurch Earthquake

Stomach bug lays 110 low in Darfield

CAROLINE KING AND GEORGINA STYLIANOU

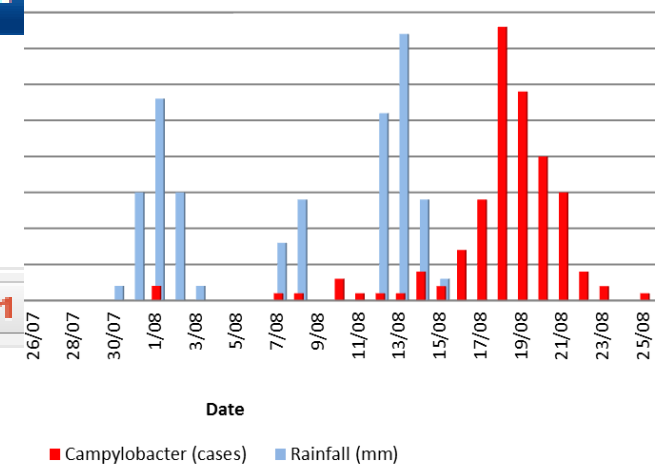
Last updated 05:00 25/08/2012

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Darfield teen Chloe Walker has had a bucket by her side for a week.

The 13-year-old is among more than 110 people to have been hit with gastroenteritis, a serious stomach illness, in the Darfield area after drinking contaminated water.

Chloe's family were using boiled water after a notice was issued by the Selwyn District Council. The notice came after E. coli was found in some parts of the local water supply.

However, on one occasion Chloe "forgot" to use boiled water. She drank a glass of tap water from the kitchen tap with her teeth.

The next day, the Darfield High School student had a sore stomach.

What followed was the onslaught of vomiting and diarrhoea.

Chloe's father, said when the vomiting hit she grabbed the first thing she could get her hands on - a cake mixer.

Chloe said the stomach pains were soon crippling.

Chloe's father said he was pretty much in tears with the pain because it was so bad. Every time I got the chills, she said, "It's so cold," she said.



Te Awa Tupua Act

- Whanganui River and ecosystem a legal standing in its own right, guaranteeing its “health and well-being”.



 New Zealand's parliament has given the Whanganui River and ecosystem a legal standing in its own right. Photograph: Alamy



Acknowledge all ESR staff especially Dr Brent Gilpin for use of their material and slides