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An epizootic of bovine ephemeral fever in NSW in 2008 due to long
distance dispersal of vectors

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Bovine Ephemeral Fever (BEF)

- Disease of cattle and water buffalo
- Observed in many tropical, subtropical and temperate regions of Africa, Australia, the Middle East and Asia
- Caused by bovine ephemeral fever virus (family *Rhabdoviridae*, genus *ephemerovirus*)
- An arbovirus – mosquitoes (*Culex annulirostris*) appear to be the most likely vectors due to association of outbreaks with heavy rainfall.



Clinical signs

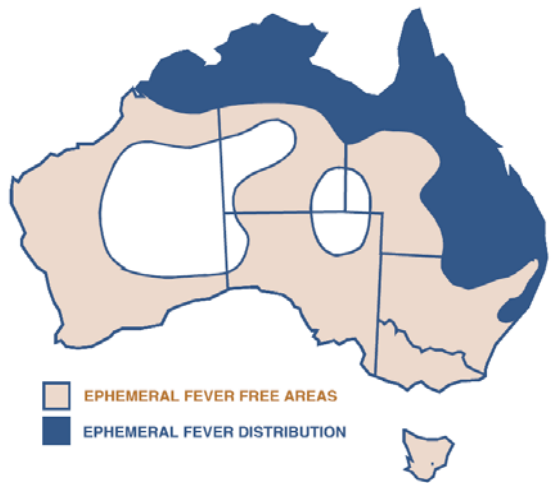
- Incubation period as short as 36-48 hours
- Fever (up to 41 °C), inappetance, lethargy
- Drooling
- Stiffness, shifting lameness, reluctance to move and recumbancy
- In uncomplicated cases sudden onset and rapid recovery within 3 days
- Bulls and cows in fat or good body condition may be more severely affected and unable to rise
- Mortality < 1%



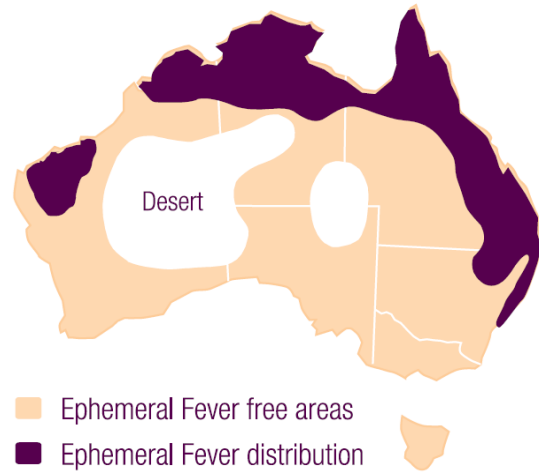


Endemic transmission range

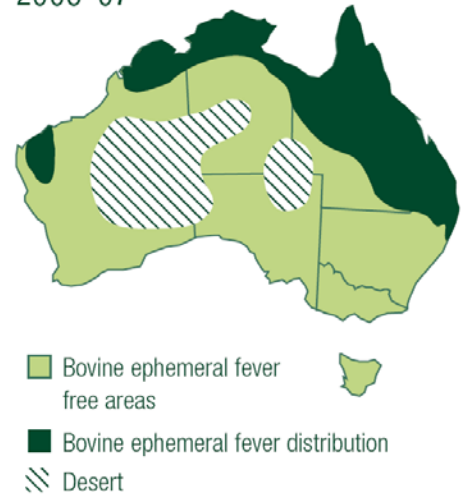
Limits of Ephemeral Fever Virus 2000-2001



LIMITS OF EPHEMERAL FEVER VIRUS 2003/2004



Limits of bovine ephemeral fever virus 2006-07



Historical events

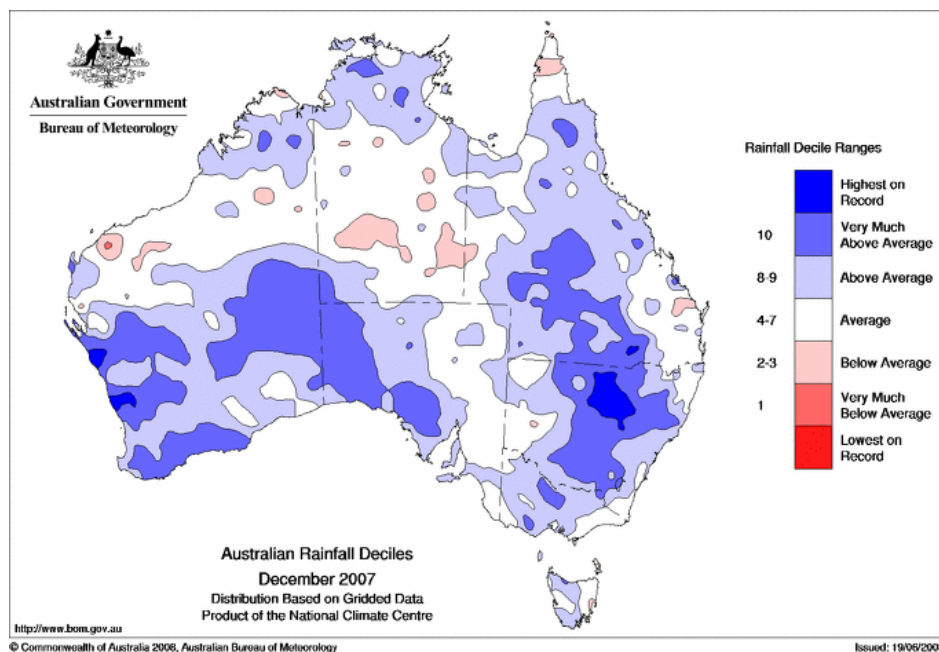
■ Epizootics in NSW

- 1936/37
- 1955/56
- 1967/68
- 1970/71
- 1995/96



2008 Epizootic

- ‘Very much above average’ and ‘highest on record’ rainfall in southern central Queensland and central northern NSW during December 2007 preceded the first cases in NSW



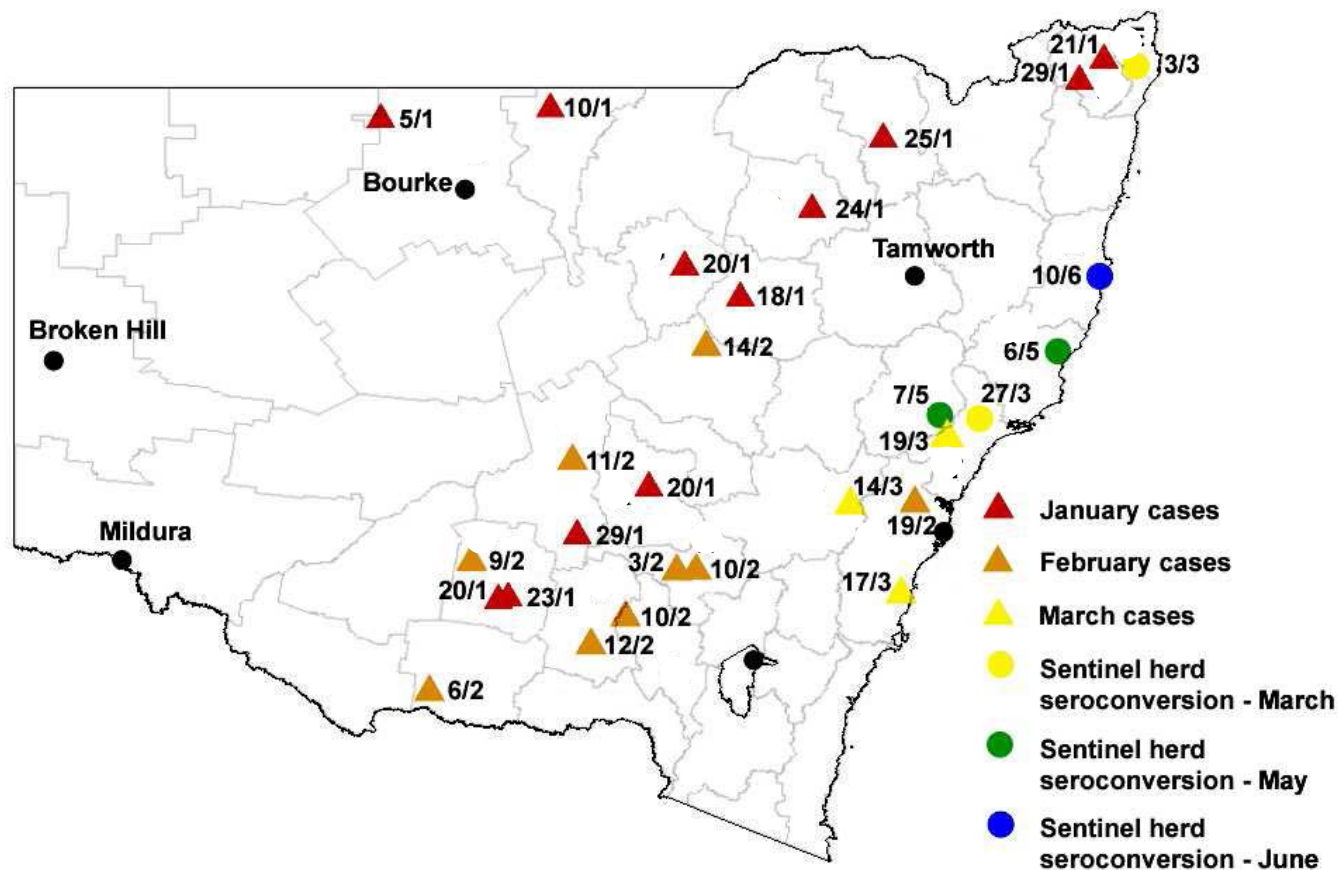


2008 Epizootic

- First reports of BEF near Bourke and Brewarrina in the first week of January 2008
- Further cases confirmed in mid-late January near Coonamble, Coonabarabran, Warialda and Narrabri
- Cases were typically observed close to water courses

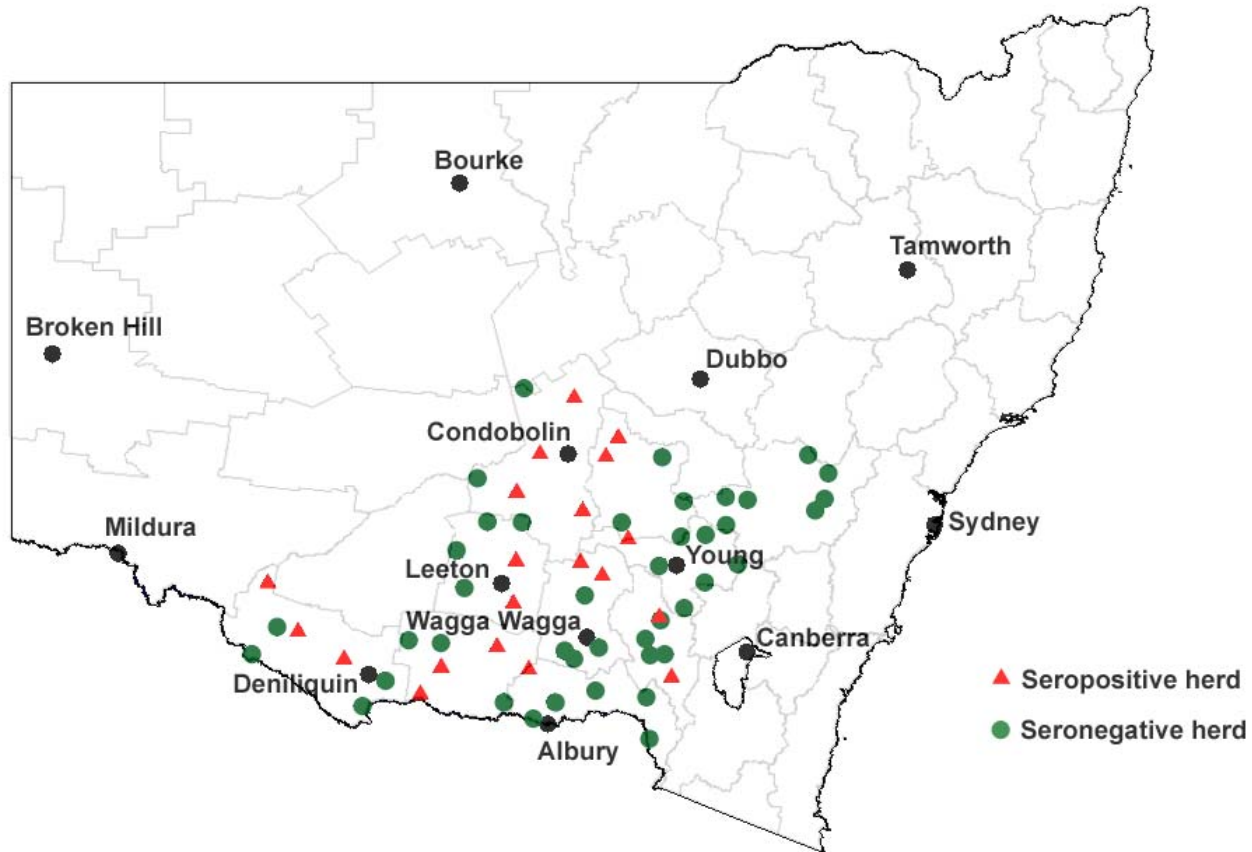


2008 Epizootic – Clinical cases and NAMP



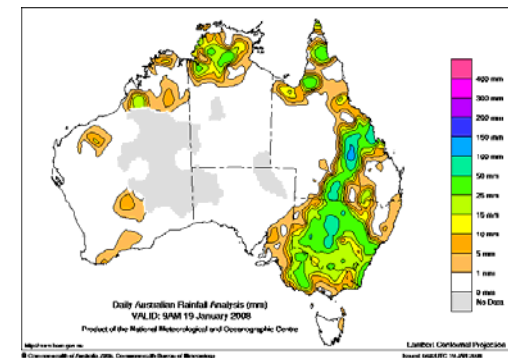


BEF Survey: April – July 2008



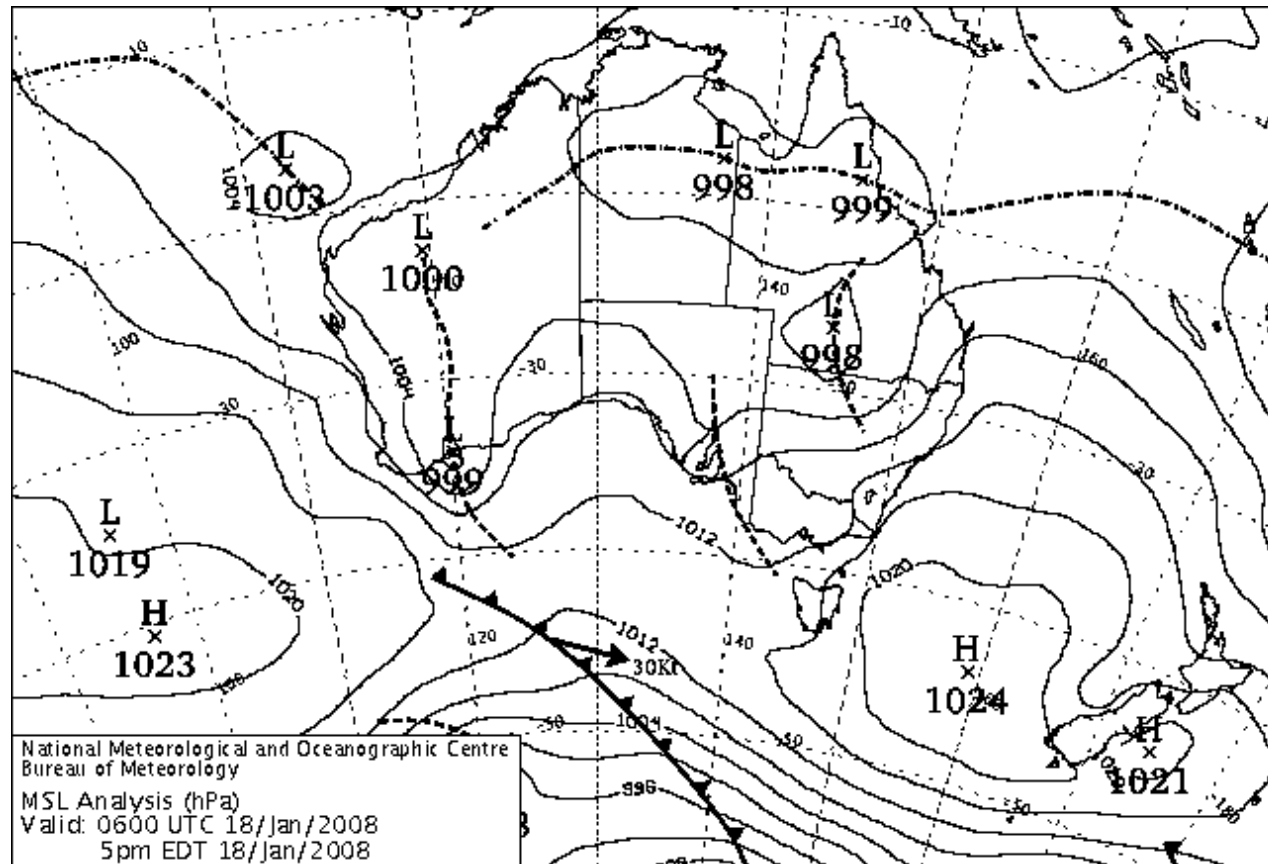
Transmission to Southern NSW

- District veterinarians suggested that mosquitoes were being blown down from the north with storm activity
- Synoptic charts for the month of January 2008 were examined
- Wind conditions suitable for southward displacement of vectors on 10-12, 15 and 18-19 January 2008
- First clinical cases observed on 20 January 2008
- Weather conditions on 18-19 January were caused by a low pressure system moving south across NSW and associated with significant rainfall



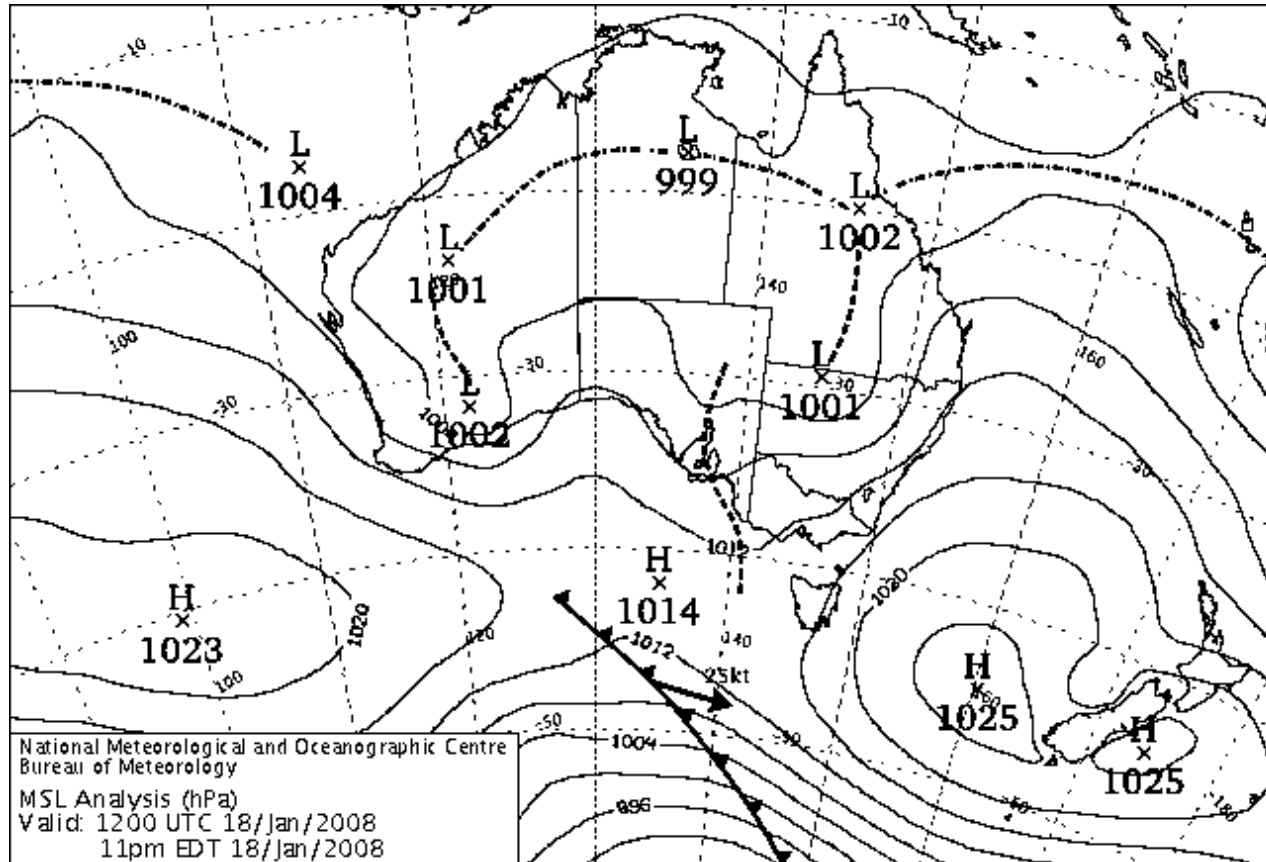


5 PM 18 January 2008



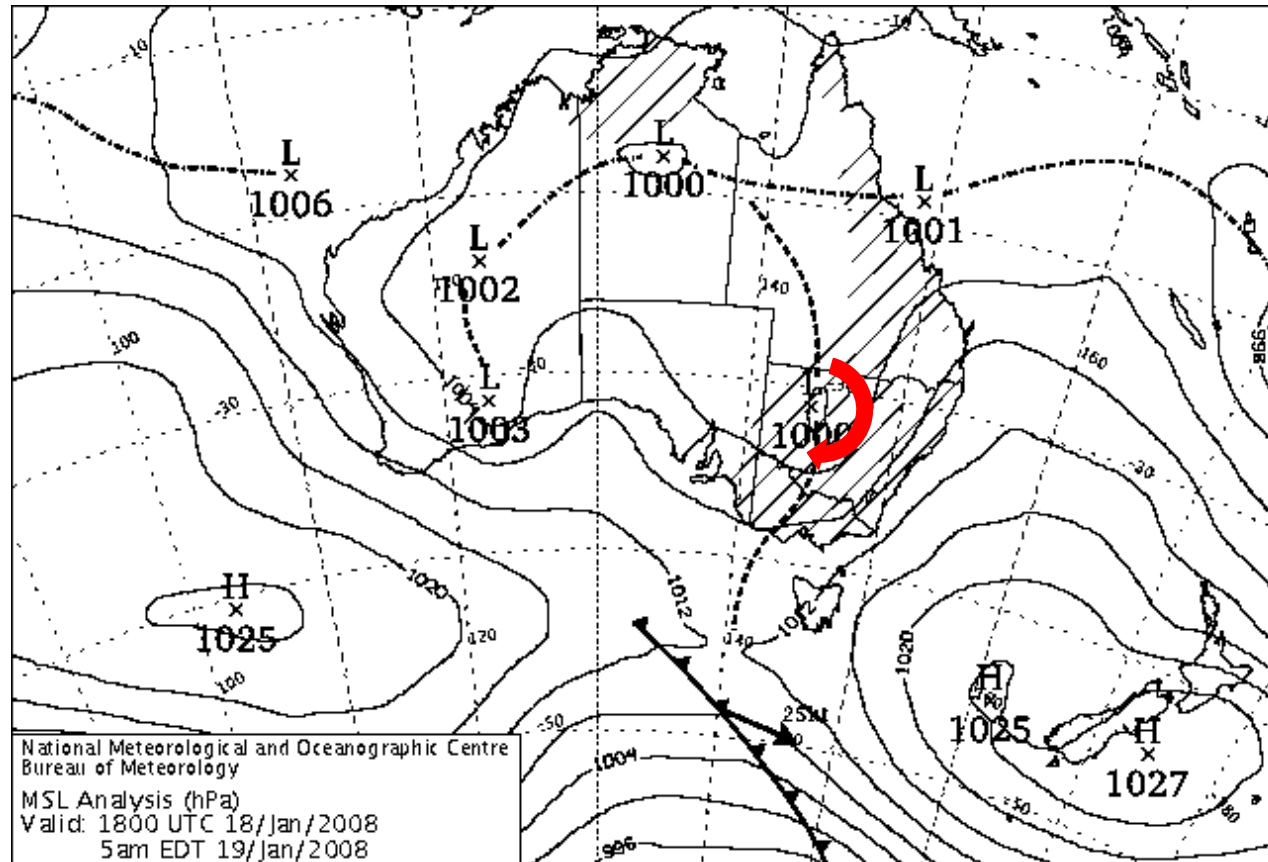


11 PM 18 January 2008



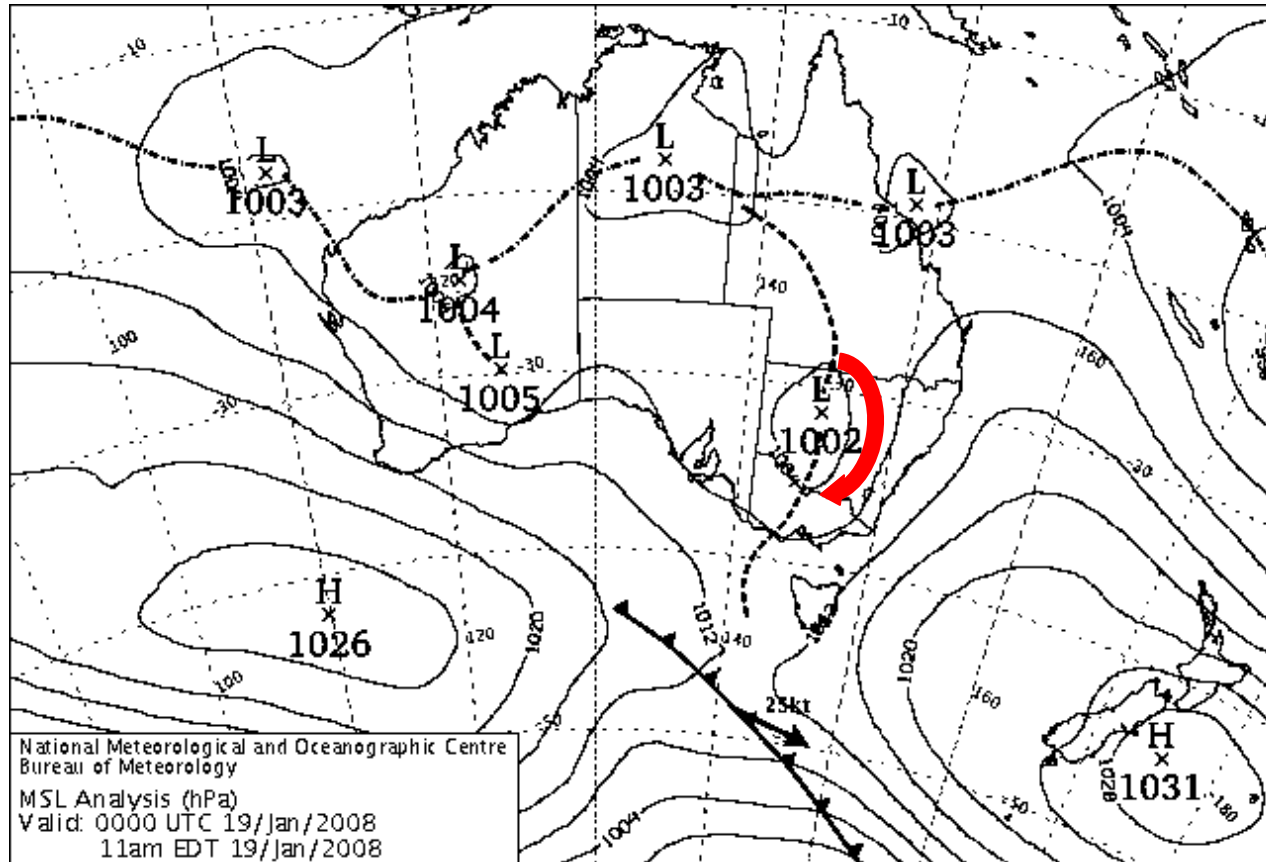


5 AM 19 January 2008



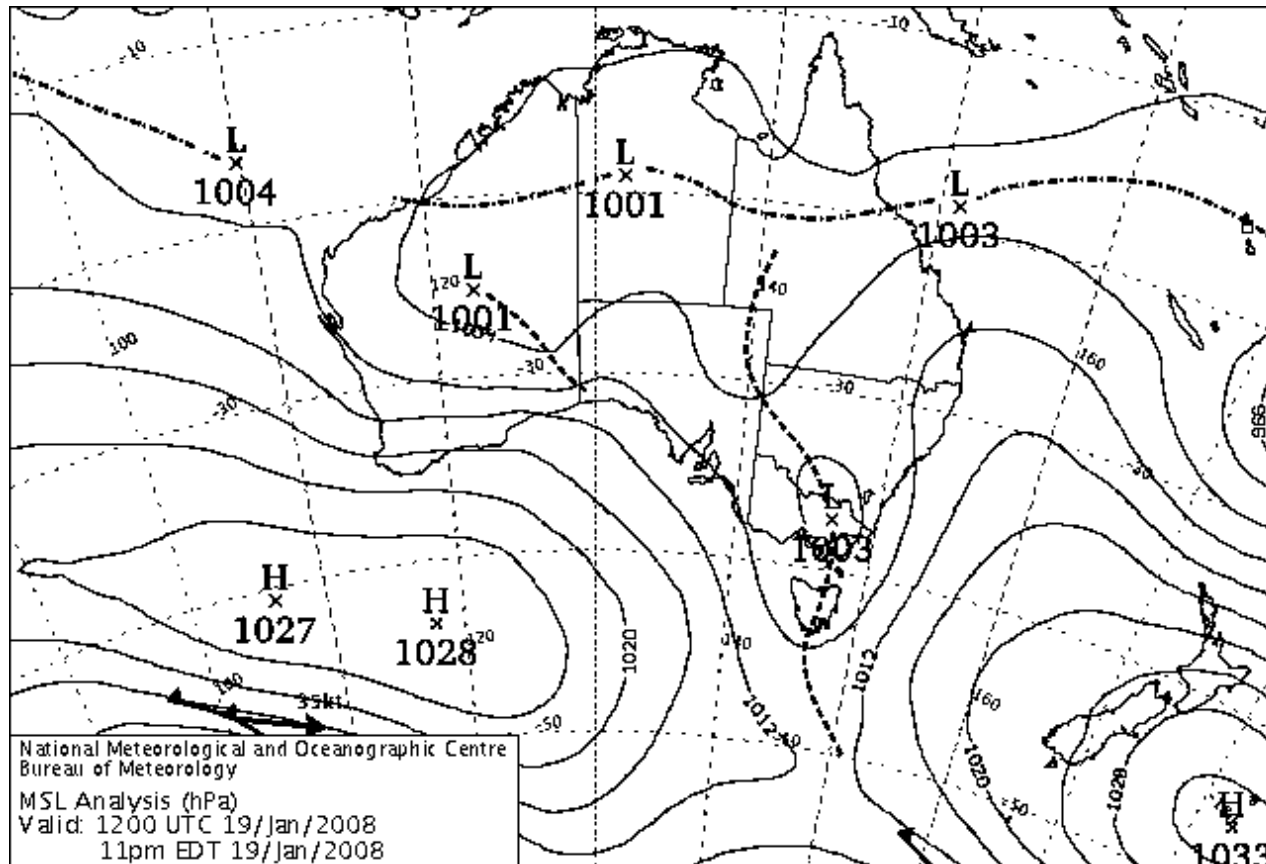


11 AM 19 January 2009



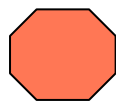


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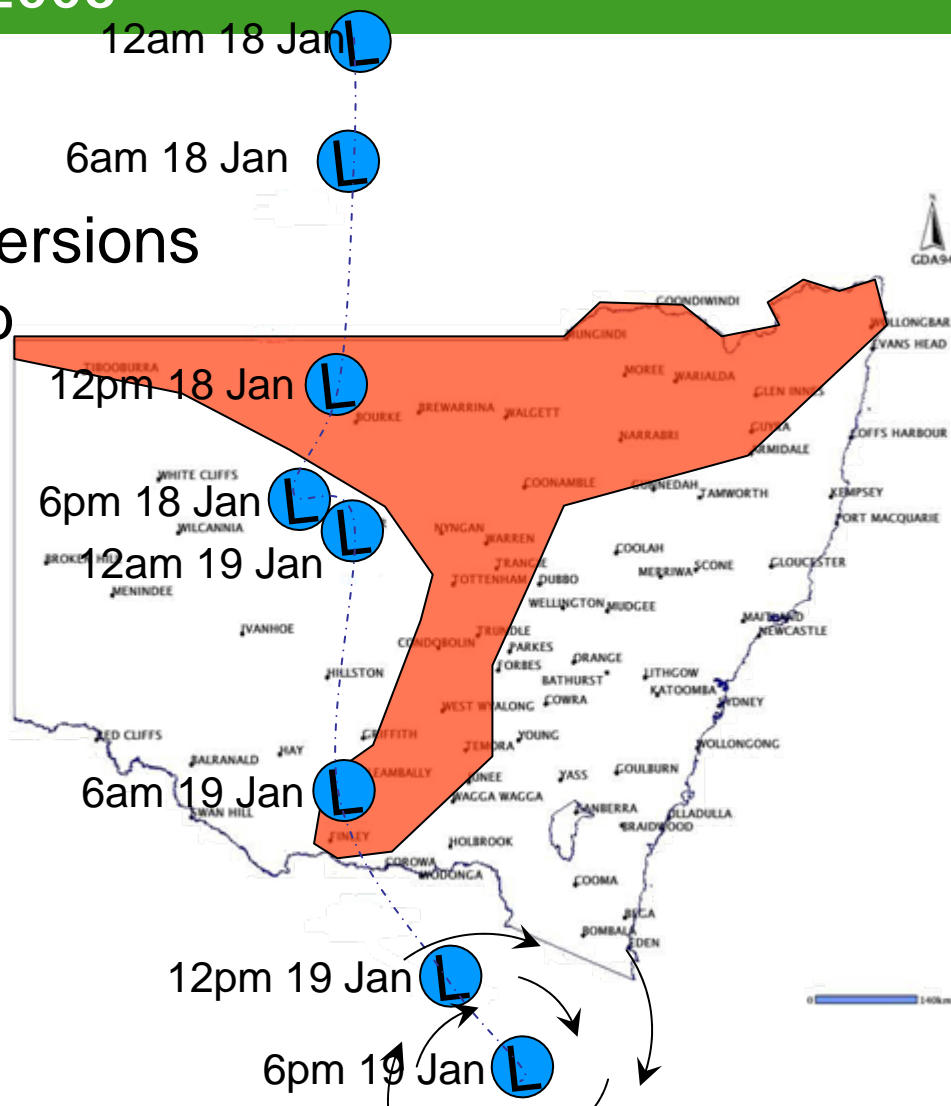




Track of Tropical Low Pressure System from 18 – 19 January 2008



Seroconversions
By 12 Feb





Additional comments

- Uncommon meteorological event
- Infected vectors taken up in updrafts ahead of the low pressure cell on the evening of 18 Jan 08
- That rapid movement of vectors was due to wind dispersal and ‘dumping’ of vectors from the low pressure cell that moved across NSW on 18-19 Jan 08
- Potential dispersal distances of 650 km for mosquitoes has been reported
- Limited local transmission due to drought?



Summary

- Heavy rainfall in December 2007 provided a suitable environment for vector breeding, resulting in the initiation and support for BEFV transmission in north western NSW
- The movement of a low pressure system southwards across NSW in mid-January 2008 after the commencement of BEFV transmission in the north west of the state provided a vehicle for rapid movement of infected vectors



Acknowledgements

- Elizabeth Macarthur Agricultural Institute
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