

NSW Arbovirus Surveillance and Mosquito Monitoring 2022-2023

Weekly Update: Week ending 21 January 2023

(Report Number 14)



Summary

Arbovirus Detections

- **Sentinel Chickens:** There were no arbovirus detections in sentinel chickens.
- **Mosquito Isolates:** Murray Valley encephalitis virus was detected in mosquitoes collected at Griffith, Mathoura and Moama.

Mosquito Abundance

- **Inland:** LOW at Armidale, Balranald, Murrumbidgee, Narrandera, Walgett, West Wyalong, Yass and Young, MEDIUM at Albury, Macquarie Marshes, Menindee and Wilcannia, HIGH at Corowa, Deniliquin, Forbes, Mathoura, Moama, Temora and Wagga Wagga, VERY HIGH at Griffith.
- **Coast:** LOW at Byron Bay, Kempsey, Kiama, Millbank, Mullumbimby, Murwillumbah, Port Macquarie, Shoalhaven, Tweed Heads and Wauchope, MEDIUM at Gosford and Wyong, HIGH at Ballina, Bega, Lake Cathie and Newcastle.
- **Sydney:** LOW at Bankstown, Blacktown, Camden, Earlwood, Georges River, Hawkesbury, Hills Shire and Northern Beaches, MEDIUM at Canada Bay, Liverpool, Penrith and Sydney Olympic Park, HIGH at Parramatta.

Environmental Conditions

- **Climate:** In the week ending 21 January 2023, rainfall totals were low in most inland areas and moderate in southern NSW and along the coast. Average rainfall is predicted for NSW in February 2023 except for the south coast where rainfall is likely to be above average. Minimum temperatures are predicted to be higher than usual in southern and coastal NSW and about average elsewhere. Maximum temperatures are likely to be about average in NSW.
- **Tides:** High tides over 1.8 metres are predicted for 20-25 January and 18-23 February, which could trigger hatching of *Aedes vigilax*.

Human Arboviral Disease Notifications

- **Ross River Virus:** 8 cases were notified in the week ending 31 December 2022.
- **Barmah Forest Virus:** 0 cases were notified in the week ending 31 December 2022.

Comments and other findings of note

A high proportion of the mosquitoes collected inland have been the species *Culex annulirostris*, which is a vector for Japanese Encephalitis virus and Murray Valley encephalitis virus (MVEV). MVEV was detected in mosquitoes collected at Griffith (for the second consecutive week), Mathoura and Moama. The primary hosts of MVEV in natural transmission cycles are thought to be waterbirds. Only a small proportion of people infected with MVEV experience symptoms, which may include fever, headache, nausea, vomiting, loss of appetite, diarrhoea, and muscle aches. Severe MVEV infection causing brain inflammation is very rare and can result in lifelong neurological complications or be fatal. Signs of severe MVEV infection may include severe headache, neck stiffness, sensitivity to bright lights, drowsiness, confusion, seizures, and loss of consciousness.

Weekly reports are available at:

www.health.nsw.gov.au/Infectious/mosquito-borne/Pages/surveillance.aspx

Please send questions or comments about this report to:

Surveillance and Risk Unit, Environmental Health Branch, Health Protection NSW:
hssg-ehbsurveillance@health.nsw.gov.au

Testing and scientific services are provided by the Department of Medical Entomology, NSW Health Pathology, Institute of Clinical Pathology and Medical Research (ICPMR) for mosquito surveillance, and the Arbovirus Emerging Diseases Unit, NSW Health Pathology (ICPMR) for sentinel chicken surveillance.

The arbovirus surveillance and mosquito monitoring results in this report remain the property of the NSW Ministry of Health and may not be used or disseminated to unauthorised persons or organisations without permission.

SPHN (EH) 220867

Cover photos: **Bottom left** - Common banded mosquito, *Culex annulirostris*
Top and bottom right - Saltmarsh mosquito, *Aedes vigilax*
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Arbovirus Detections

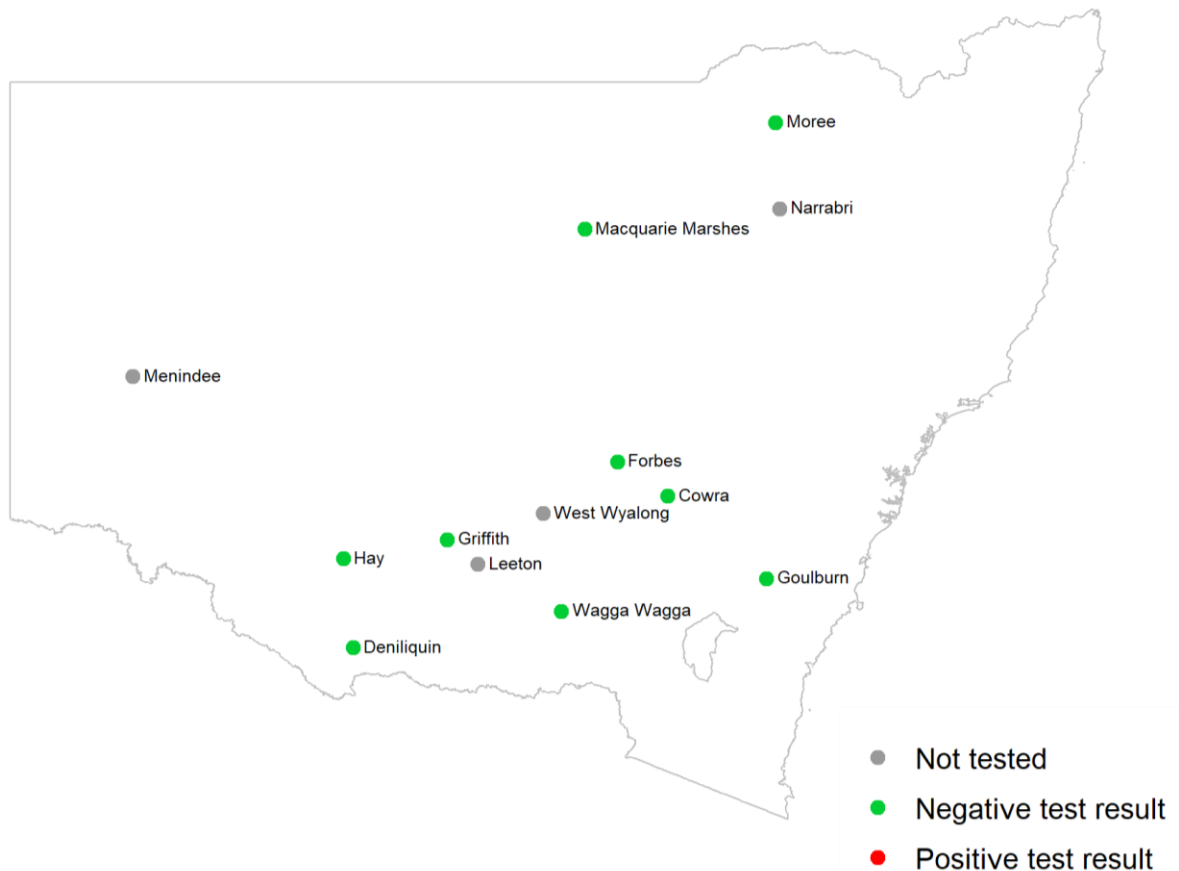
This section details detections of Murray Valley encephalitis virus, Kunjin virus, Ross River virus, Barmah Forest virus and Japanese encephalitis virus in the NSW Arbovirus Surveillance and Mosquito Monitoring Program.

Sentinel chickens

Chickens are bled for detection of antibodies directed against Murray Valley encephalitis virus, Kunjin virus and Japanese encephalitis virus, indicating exposure to these viruses. Test results for the past two weeks are shown in the map below and all positive test results for the season are detailed in the table.

Sentinel chicken antibody test results for samples collected in the two weeks to 21 January 2023

There were no positive test results.



Positive test results in the 2022-2023 surveillance season

Date of sample collection	Location	Virus
There have been no detections in sentinel chickens in the 2022-2023 surveillance season		

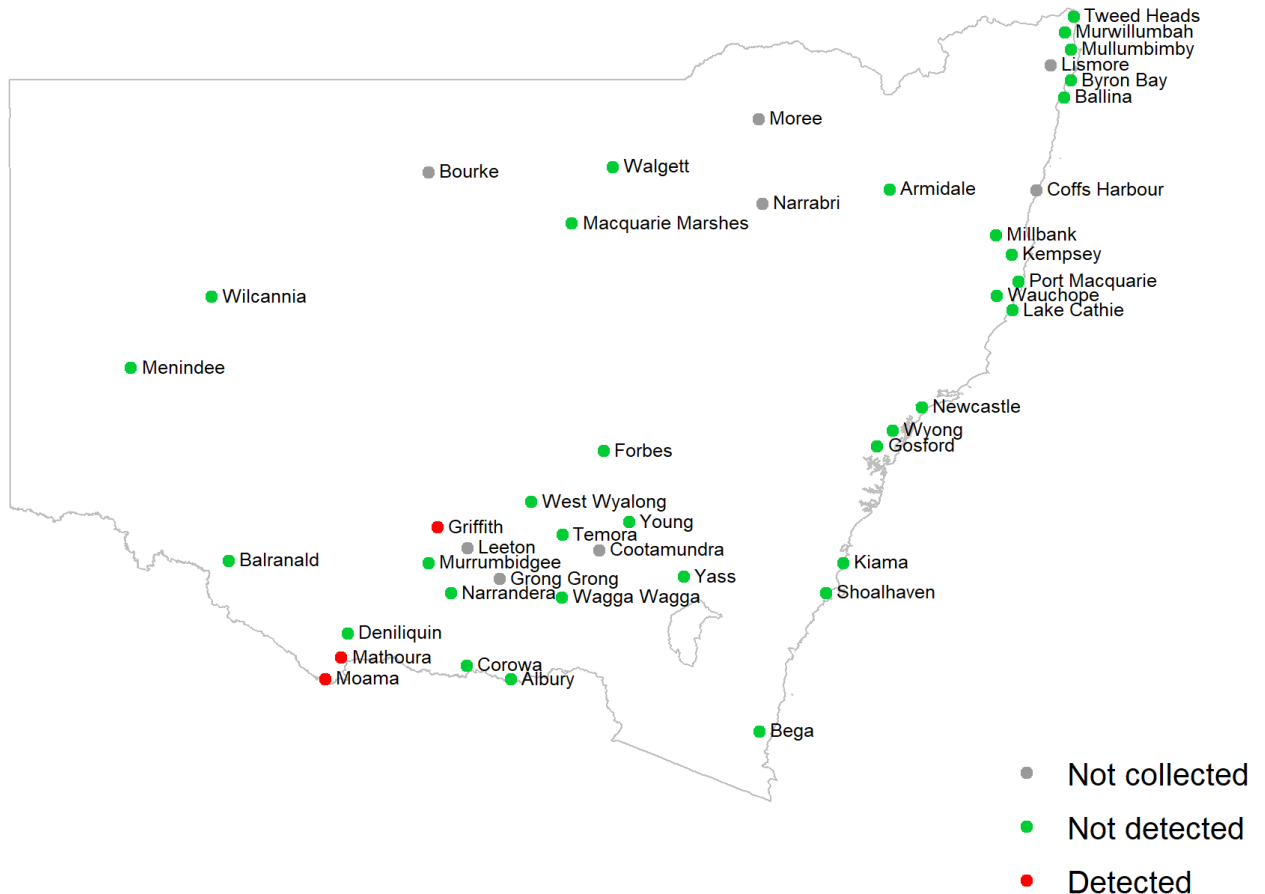
Mosquito isolates

Whole grinds of collected mosquitoes are tested for arbovirus nucleic acids to determine the presence of arboviruses in mosquitoes. Test results for detections of Ross River virus, Barmah Forest virus, Murray Valley encephalitis and Japanese encephalitis virus for the past week are shown in the maps below. Detections of all arboviruses (including Edge Hill virus) for the season are detailed in the table.

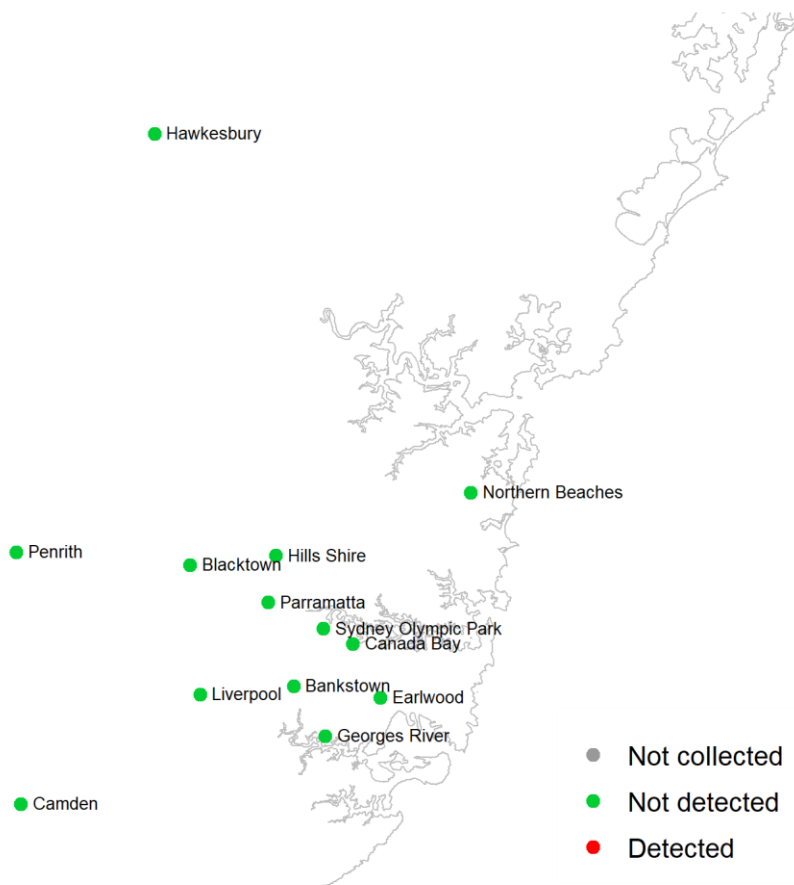
Test results for mosquito trapping sites reported in the week ending 21 January 2023

Murray Valley encephalitis virus was detected in mosquitoes collected at Griffith, Mathoura and Moama.

Inland and Coastal sites



Sydney sites



Arboviruses detected in the 2022-2023 surveillance season

Date of sample collection	Location	Virus
14 November 2022	Macquarie Marshes	Barmah Forest
15 November 2022	Griffith	Ross River
22 November 2022	Griffith	Barmah Forest
5 December 2022	Leeton	Barmah Forest
5 December 2022	Temora	Ross River
5 December 2022	Grong Grong	Edge Hill
6 December 2022	Deniliquin	Barmah Forest
6 December 2022	Griffith	Barmah Forest
12 December 2022	Grong Grong	Barmah Forest
13 December 2022	Penrith	Edge Hill
4 January 2023	Menindee	Murray Valley encephalitis
9 January 2023	Corowa	Ross River and Edge Hill
9 January 2023	Young	Barmah Forest
10 January 2023	Griffith	Murray Valley encephalitis
10 January 2023	Menindee	Murray Valley encephalitis
16 January 2023	Griffith	Murray Valley encephalitis
17 January 2023	Mathoura	Murray Valley encephalitis
17 January 2023	Moama	Murray Valley encephalitis

Note:

Human cases of Edge Hill virus have rarely been reported. Infection may present as a mild self-limiting febrile illness with body aches.

Mosquito Abundance

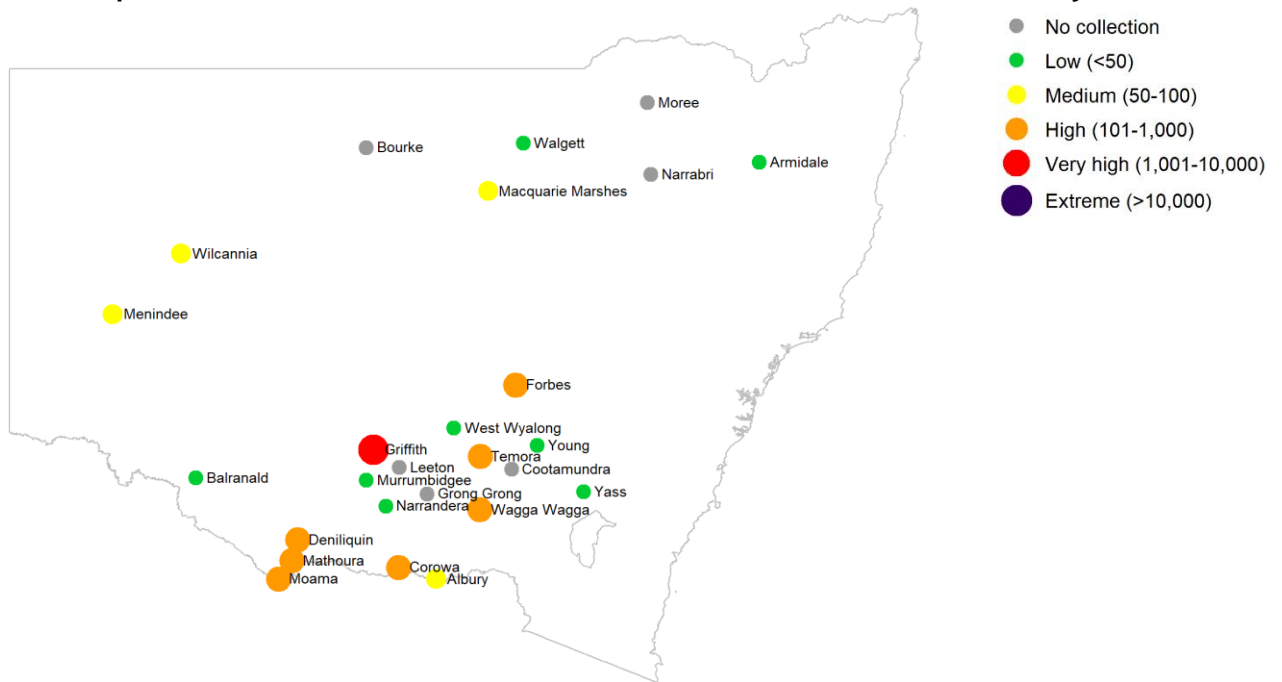
This section details counts of mosquitoes in the NSW Arbovirus Surveillance and Mosquito Monitoring Program. Each location represents the count average for all trapping sites at that location for the most recent week that collections were provided prior to preparation of this report.

Culex annulirostris and *Aedes vigilax* are vectors of interest for Ross River virus and Barmah Forest virus, *Culex annulirostris* is also a vector for Japanese encephalitis virus.

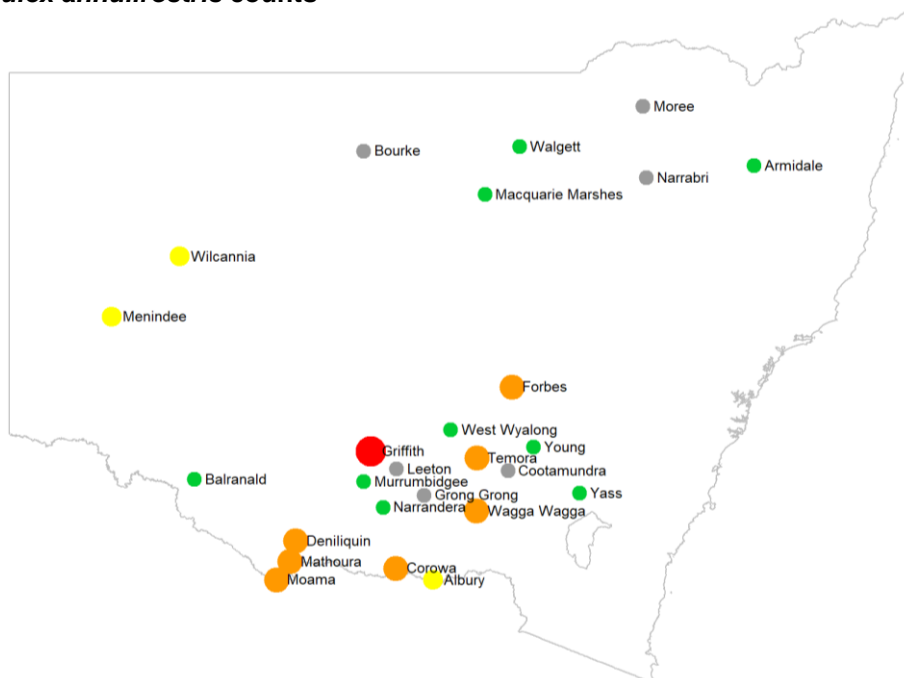
Mosquito counts (average per trap per location) for mosquito trapping sites reported in the week ending 21 January 2023

Inland sites

Total mosquito counts



Culex annulirostris counts



**Coastal sites
Total mosquito counts**



Key:

- No collection
- Low (<50)
- Medium (50-100)
- High (101-1,000)
- Very high (1,001-10,000)
- Extreme (>10,000)

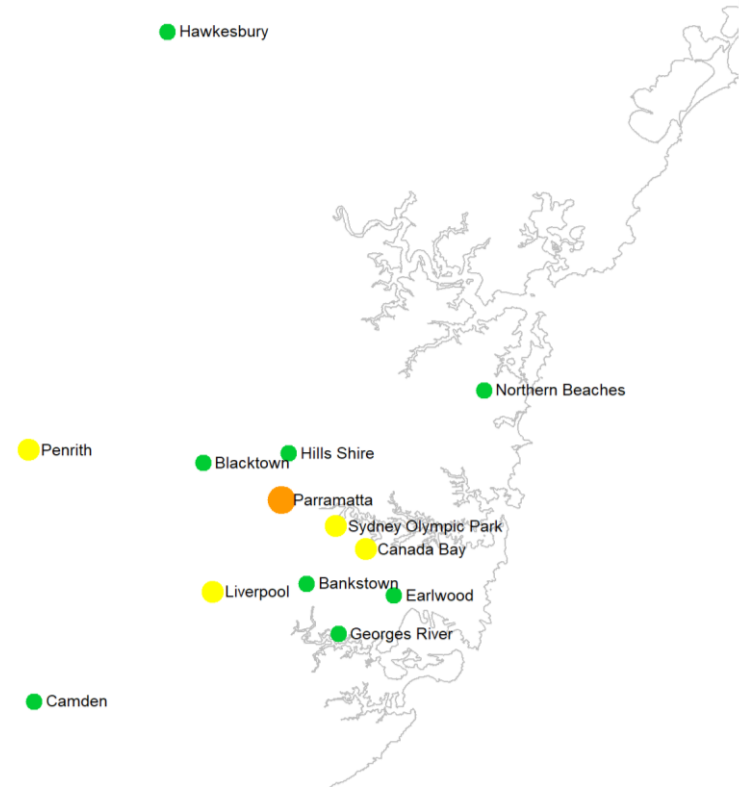
***Culex annulostris* counts**



***Aedes vigilax* counts**



Sydney sites Total mosquito counts



Key:

- No collection
- Low (<50)
- Medium (50-100)
- High (101-1,000)
- Very high (1,001-10,000)
- Extreme (>10,000)

Culex annulirostris counts



Aedes vigilax counts



Mosquito counts for the 2022-23 surveillance season Inland

"Cx. annul" refers to *Culex annulirostris* and "Ae. vigilax" refers to *Aedes vigilax*.

Key:

- No collection
- Low (<50)
- Medium (50-100)
- High (101-1,000)
- Very high (1,001-10,000)
- Extreme (>10,000)

		WEEK ENDING																														
		Oct-22			Nov-22				Dec-22					Jan-23				Feb-23				Mar-23				Apr-23			May-23			
Location	Mosquito	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22	29	6	13
Albury	Cx. annul																															
	Total																															
Armidale	Cx. annul																															
	Total																															
Balranald	Cx. annul																															
	Total																															
Bourke	Cx. annul																															
	Total																															
Cootamundra	Cx. annul																															
	Total																															
Corowa	Cx. annul																															
	Total																															
Deniliquin	Cx. annul																															
	Total																															
Forbes	Cx. annul																															
	Total																															
Griffith	Cx. annul																															
	Total																															
Grong Grong	Cx. annul																															
	Total																															
Leeton	Cx. annul																															
	Total																															
Macquarie Marshes	Cx. annul																															
	Total																															
Mathoura	Cx. annul																															
	Total																															
Menindee	Cx. annul																															
	Total																															
Moama	Cx. annul																															
	Total																															
Moree	Cx. annul																															
	Total																															
Murrumbidgee	Cx. annul																															
	Total																															
Narrabri	Cx. annul																															
	Total																															
Narrandera	Cx. annul																															
	Total																															
Temora	Cx. annul																															
	Total																															
Wagga Wagga	Cx. annul																															
	Total																															
Walgett	Cx. annul																															
	Total																															
West Wyalong	Cx. annul																															
	Total																															
Wilcannia	Cx. annul																															
	Total																															
Yass	Cx. annul																															
	Total																															
Young	Cx. annul																															
	Total																															

Coastal

		WEEK ENDING																														
		Oct-22			Nov-22			Dec-22				Jan-23				Feb-23				Mar-23				Apr-23			May-23					
Location	Mosquito	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22	29	6	13
Ballina	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Bega	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Byron Bay	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Coffs Harbour	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Gosford	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Kempsey	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Kiama	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Lake Cathie	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Lismore	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Millbank	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Mullumbimby	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Murwillumbah	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Newcastle	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Port Macquarie	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Shoalhaven	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Tweed Heads	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Wauchope	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Wyong	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															

Sydney

		WEEK ENDING																														
		Oct-22			Nov-22				Dec-22					Jan-23				Feb-23				Mar-23				Apr-23			May-23			
Location	Mosquito	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22	29	6	13
Bankstown	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Blacktown	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Camden	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Canada Bay	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Earlwood	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Georges River	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Hawkesbury	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Hills Shire	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Liverpool	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Northern Beaches	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Parramatta	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Penrith	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Sydney Olympic Park	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															

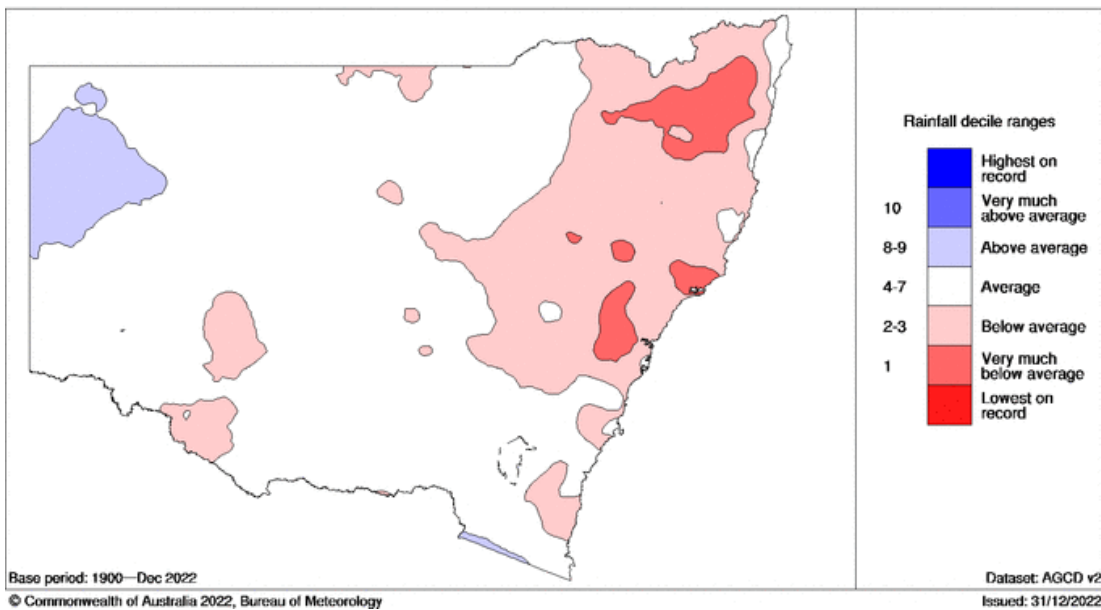
Environmental Conditions

Mosquitoes require water to breed. Rainfall and tides (for the salt marsh mosquito, *Aedes vigilax*) are important contributing factors for proliferation of mosquito numbers. Unseasonably warm weather can also contribute to higher mosquito numbers.

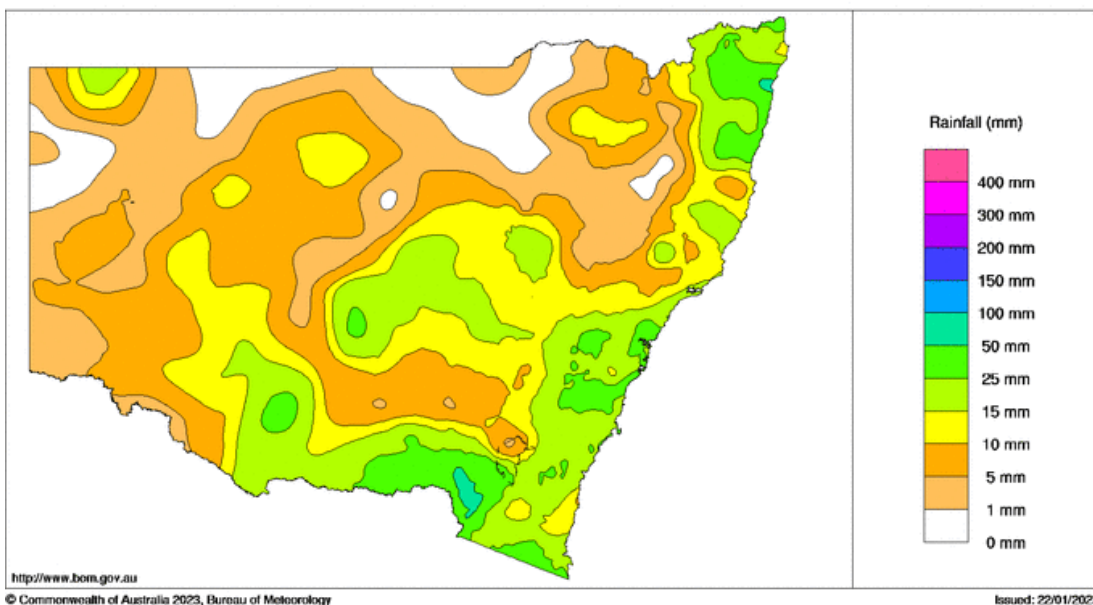
Rainfall

In December, rainfall was below average in northeastern NSW and average for most other areas of the state. In the week ending 21 January 2023, rainfall totals were low in most inland areas and moderate in southern NSW and along the coast.

New South Wales rainfall deciles December 2022
Australian Gridded Climate Data



New South Wales Rainfall Totals (mm) Week Ending 21st January 2023
Australian Bureau of Meteorology



Source: Australian Government, Bureau of Meteorology: www.bom.gov.au/climate/maps/rainfall

Next month's rainfall and temperature outlook

The Bureau of Meteorology's rainfall outlook predicts that NSW is likely to receive average rainfall for February, except for the south coast where rainfall is likely to be above average.

www.bom.gov.au/climate/outlooks/#/rainfall/median/monthly/0

The Bureau of Meteorology's temperature outlook predicts that minimum temperatures are likely to be higher than usual in southern and coastal NSW for February and about average elsewhere. Maximum temperatures are likely to be about average in NSW.

www.bom.gov.au/climate/outlooks/#/temperature/maximum/median/monthly/0

www.bom.gov.au/climate/outlooks/#/temperature/minimum/median/monthly/0

Tides

Tidal information is relevant for the prediction of the activity of the salt marsh mosquito, *Aedes vigilax*. Typically for NSW, high tides of over 1.8 m, as measured at Sydney, can induce hatching of *Aedes vigilax* larvae. Predicted tide heights can provide some indication of when this is likely to occur.

Dates of predicted high tides of over 1.8 m at Sydney (Fort Denison)

- 20-25 January 2023
- 18-23 February 2023

Source: Australian Government, Bureau of Meteorology: www.bom.gov.au/australia/tides/#/nsw-sydney-fort-denison

Note: Measured tides at Sydney Port Jackson for the current week are available from the NSW Government, Manly Hydraulics Laboratory: <https://mhl.nsw.gov.au/Data-OceanTide>.

Human Arboviral Disease Notifications

Under the *NSW Public Health Act 2010*, human arboviral infections are notifiable in NSW. The NSW Health Communicable Diseases Weekly Report (CDWR) reports confirmed and probable case numbers by the week they are received by the NSW notifiable diseases surveillance system, and is available at: www.health.nsw.gov.au/Infectious/reports/Pages/CDWR.aspx.

The data for Ross River virus and Barmah Forest virus from the CDWR for the latest reported 3 weeks are below.

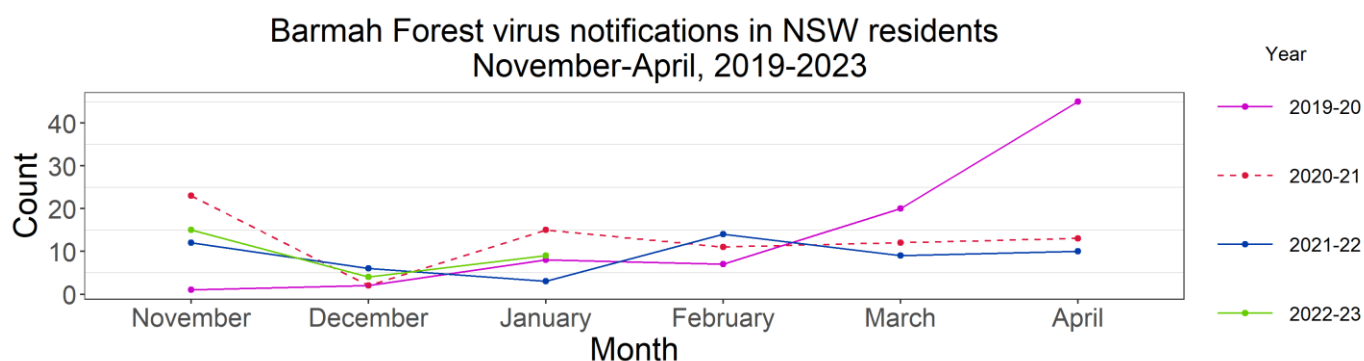
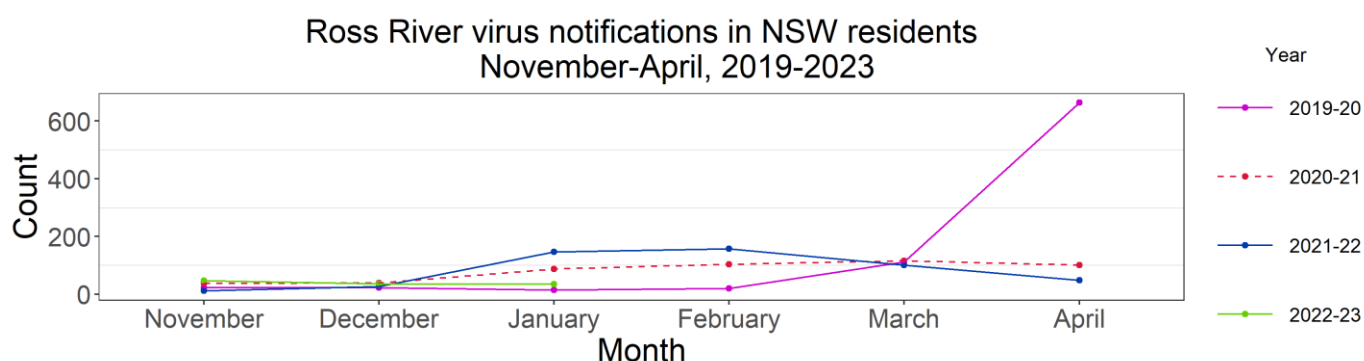
Recent notifications of Ross River virus and Barmah Forest virus infections in humans

(by date of case report received)

	Week		
	Latest week (25 – 31 Dec 2022)	1-week prior (18 – 24 Dec 2022)	2-weeks prior (11– 17 Dec 2022)
Ross River virus	8	9	8
Barmah Forest virus	0	0	2

Source: CDWR, Communicable Diseases Branch, Health Protection NSW, NSW Health

Notifications of Ross River virus and Barmah Forest virus infections, by month of disease onset (the earlier of patient-reported onset or specimen collection date), are available online at: www1.health.nsw.gov.au/IDD/pages/data.aspx. The following figures show this data for November to April of the current NSW Arbovirus Surveillance and Mosquito Monitoring season (2022-2023), and the same period in the previous three years.



Source: NSW Health Notifiable Conditions Information Management System (NCIMS), Communicable Diseases Branch and Centre for Epidemiology and Evidence, NSW Health

Notes: The data for the previous month are the notifications to date (data extracted on 23 January 2023). Notifications are for NSW residents, regardless of whether the infection was acquired or diagnosed in NSW. Notifications of Ross River virus and Barmah Forest virus infection lag the date of acquiring the infection due to the time taken for symptom development, diagnosis, notification, and other factors. The weekly numbers by date of notification are useful for monitoring recent short-term trends but represent infections that were acquired some time ago. The monthly numbers by date of onset are more timely but less exact because they represent the earlier of patient-reported onset or specimen collection date and are therefore useful for monitoring general trends in human arboviral disease over the course of a season.