

NSW Arbovirus Surveillance & Mosquito Monitoring 2022-2023

Weekly Update: Week ending 10 December 2022

(Report Number 9)



Summary

Arbovirus Detections

- **Sentinel Chickens:** There were no arbovirus detections in sentinel chickens.
- **Mosquito Isolates:** Barmah Forest virus was detected in mosquitoes collected at Deniliquin, Griffith and Leeton. Ross River virus was detected in mosquitoes collected at Temora.

Mosquito Abundance

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

Environmental Conditions

- **Climate:** In the week ending 10 December 2022, rainfall totals were low in NSW. Average January rainfall is predicted for NSW in January 2023. Minimum temperatures are predicted to be above average for January in western NSW and about average elsewhere. Maximum temperatures are likely to be above average in Far West NSW and lower than usual along the coast.
- **Tides:** High tides over 1.8 metres are predicted for 22-28 December, which could trigger hatching of *Aedes vigilax*.

Human Arboviral Disease Notifications

- **Ross River Virus:** 5 cases were notified in the week ending 19 November 2022.
- **Barmah Forest Virus:** 3 cases were notified in the week ending 19 November 2022.

Comments and other findings of note

Flood warnings are in place for many catchments across inland NSW, although numerous upstream locations are seeing levels dropping after a period of lower rainfall. Extensive surface water has likely contributed to the high numbers of mosquitoes collected inland in recent weeks. Most mosquitoes collected at Deniliquin, Forbes, Macquarie Marshes and Menindee were the species, *Culex annulirostris*, which is a vector for Japanese Encephalitis virus (JEV). JEV was detected in NSW for the first time early in 2022 and has more recently been detected in pigs in the Murray River region indicating that JEV persists in NSW after the 2022 winter.

Edge Hill virus was detected in mosquitoes collected at Grong Grong. Human cases of Edge Hill virus have rarely been reported. Infection may present as a mild self-limiting febrile illness with body aches.

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 & 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

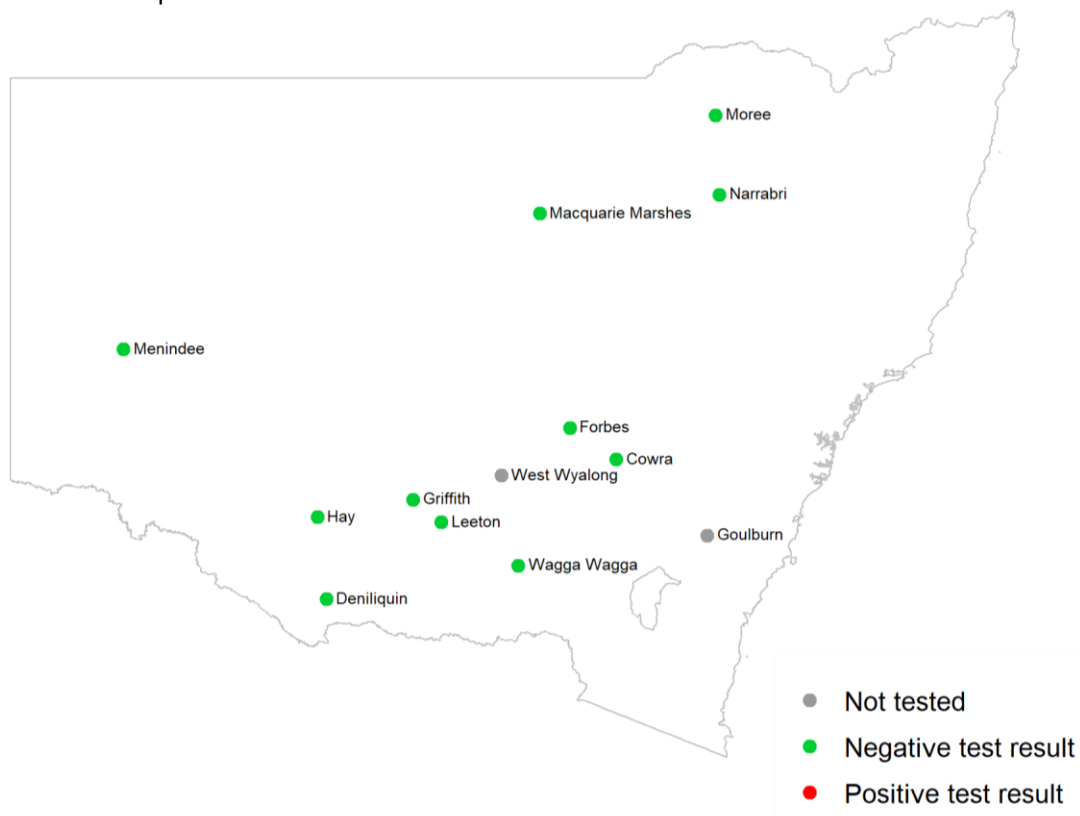
This section details detections of Murray Valley encephalitis virus, Kunjin virus, Ross River virus, Barmah Forest virus and Japanese encephalitis virus in the NSW Arbovirus Surveillance and Mosquito Monitoring Program.

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 10 December 2022

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		

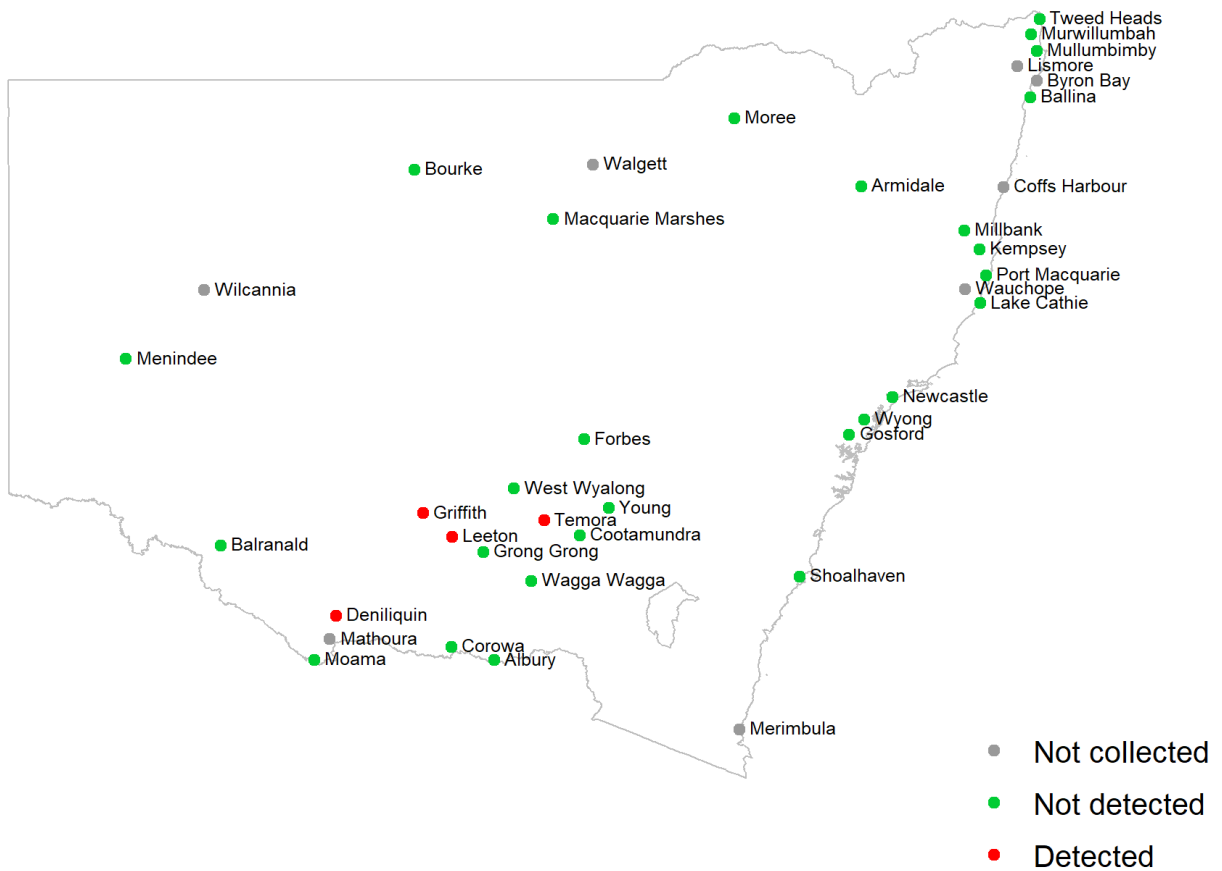
Mosquito isolates

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 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.

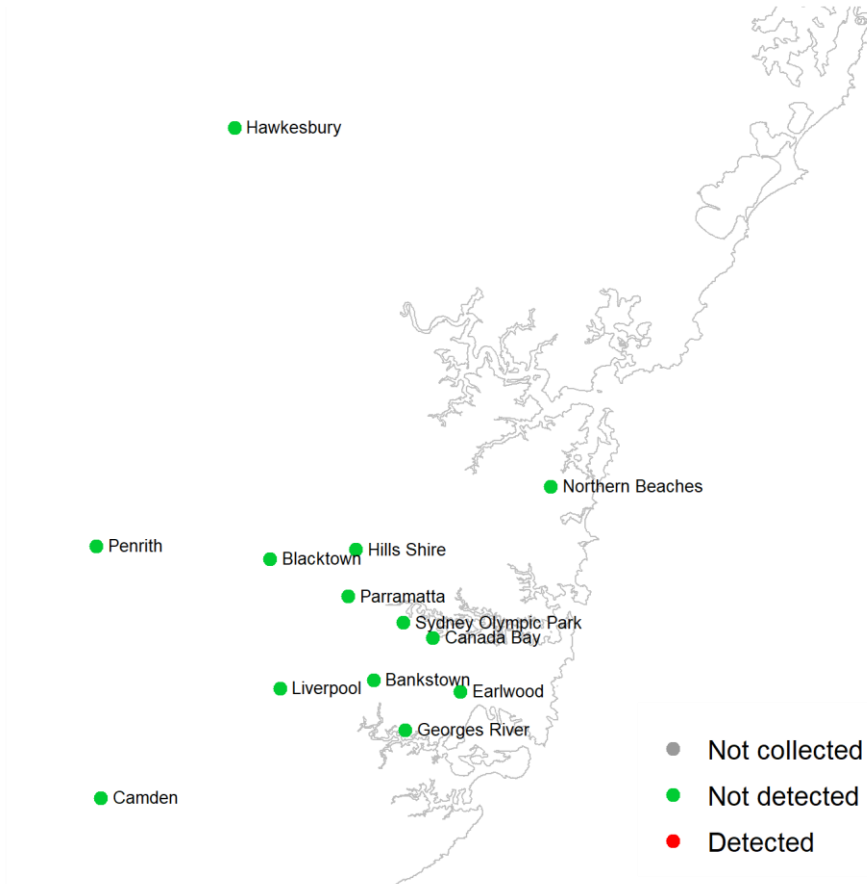
Test results for mosquito trapping sites reported in the week ending 10 December 2022

Barmah Forest virus was detected in mosquitoes collected at Leeton, Deniliquin and Griffith. Ross River virus was detected in mosquitoes collected at Temora.

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

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

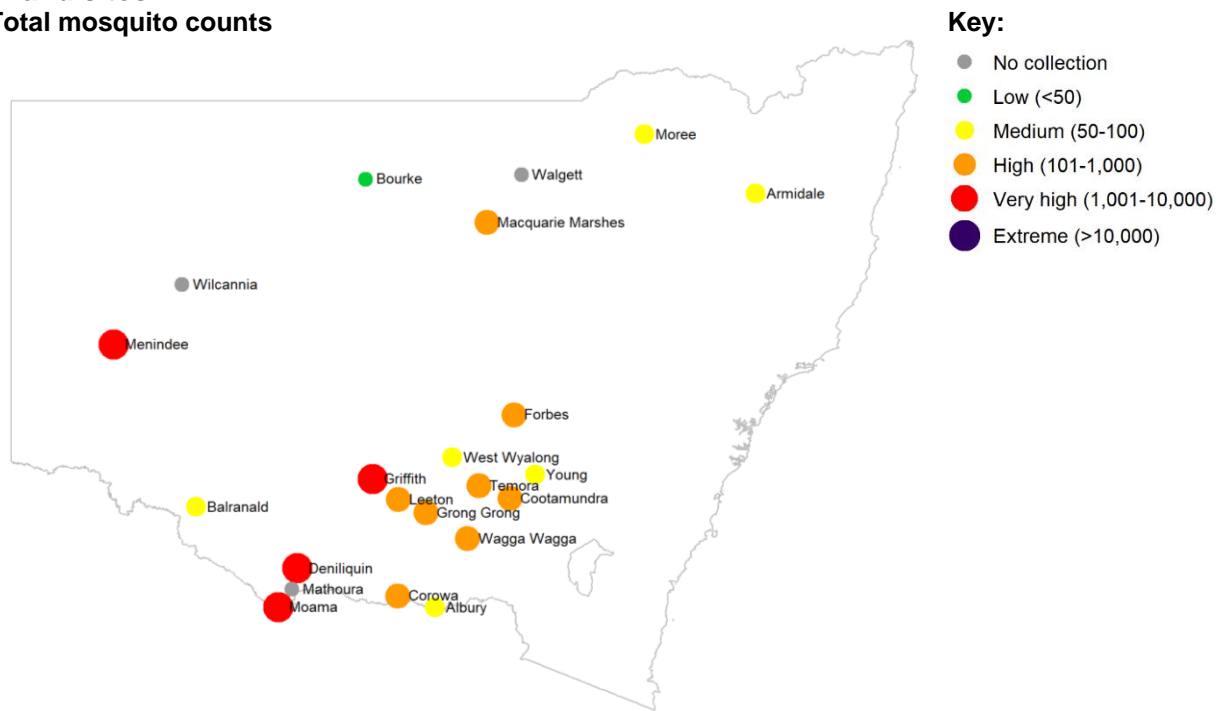
This section details counts of mosquitoes in the NSW Arbovirus Surveillance and Mosquito Monitoring Program. Each location represents the count average for all trapping sites at that location for the most recent week that collections were provided prior to preparation of this report.

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.

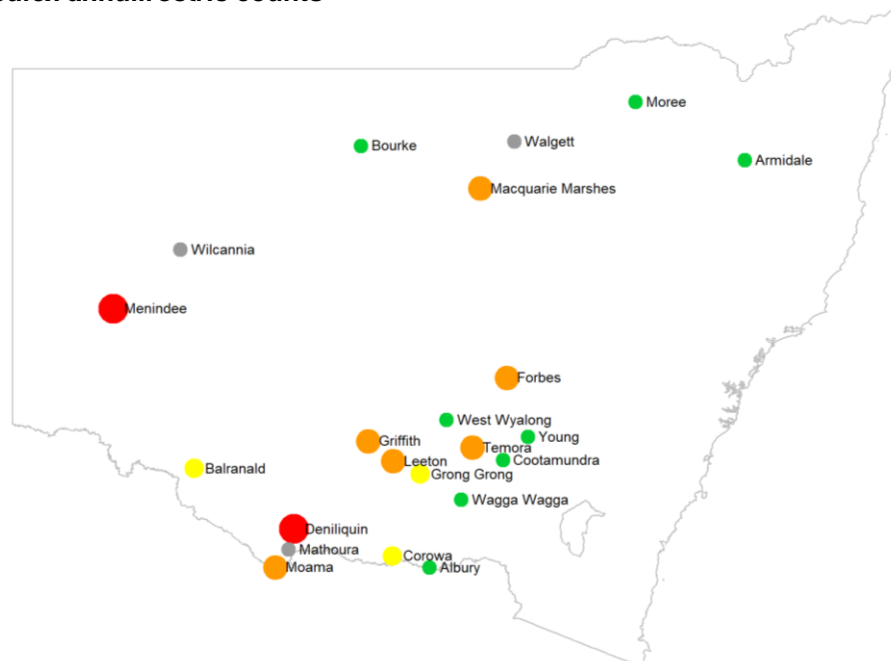
Mosquito counts (average per trap per location) for mosquito trapping sites reported in the week ending 10 December 2022

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 annulirostris* counts**



***Aedes vigilax* counts**



Sydney sites Total mosquito counts



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)

Location	Mosquito	WEEK ENDING																																																							
		Oct-22			Nov-22				Dec-22			Jan-23				Feb-23				Mar-23				Apr-23			May-23																														
		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																																																								
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Moree	Cx. annul																																																								
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Temora	Cx. annul																																																								
	Total																																																								
Wagga Wagga	Cx. annul																																																								
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Walgett	Cx. annul																																																								
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West Wyalong	Cx. annul																																																								
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Wilcannia	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																															
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																															
Lake Cathie	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Lismore	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Merimbula	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	Total																															
Millbank	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
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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																															

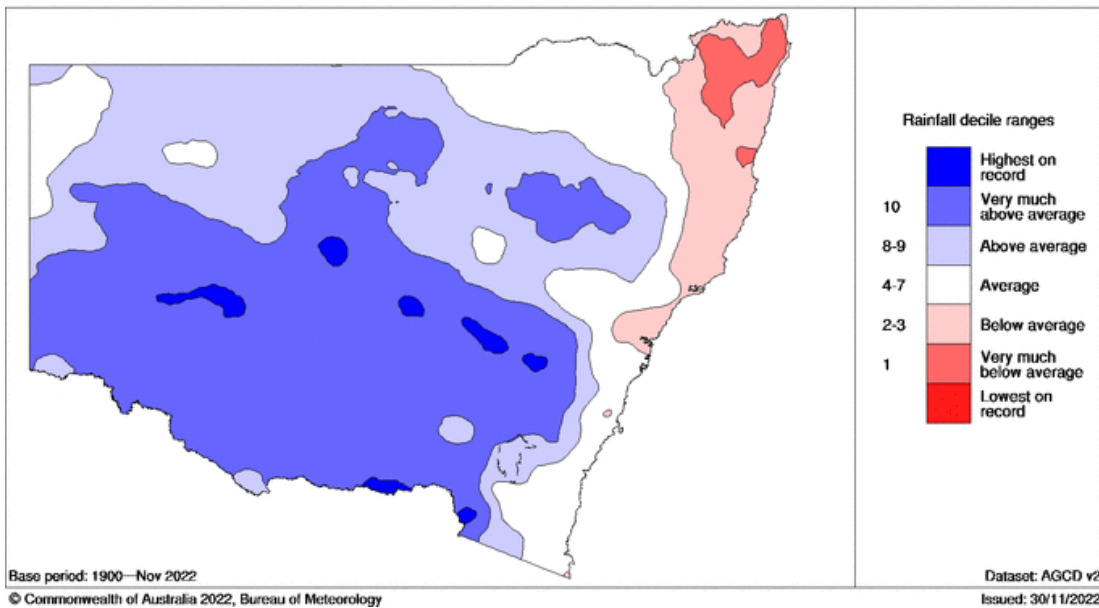
Environmental Conditions

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.

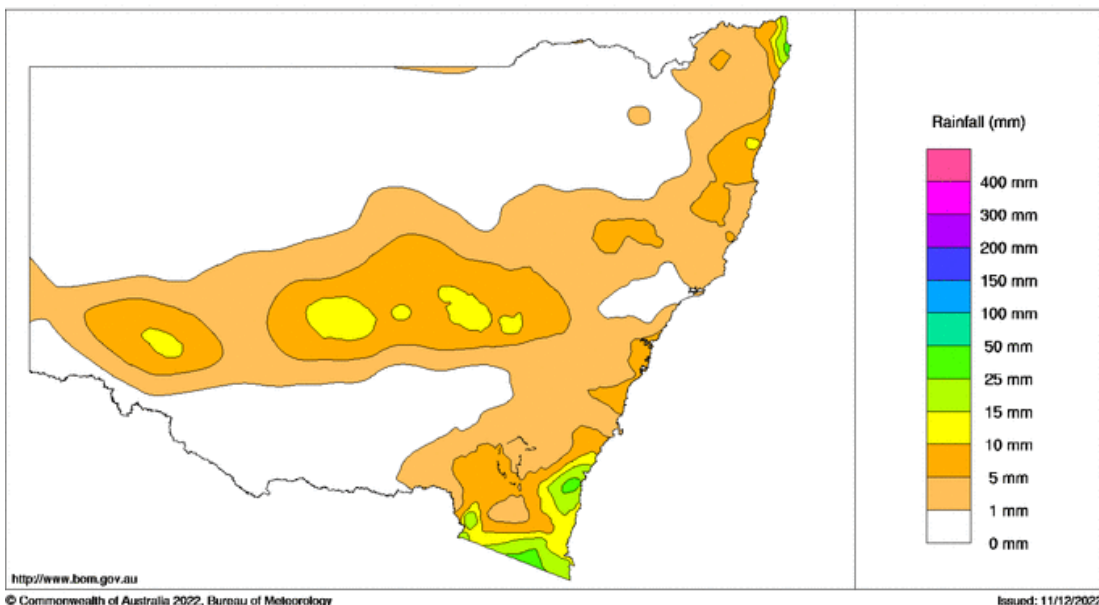
Rainfall

In November, rainfall was above average for inland areas of NSW and below average for the Mid-North and North coast. In the week ending 10 December 2022, rainfall totals were low in NSW.

New South Wales rainfall deciles November 2022
Australian Gridded Climate Data



New South Wales Rainfall Totals (mm) Week Ending 10th December 2022
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 January.

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 above average in western NSW for January and about average elsewhere. Maximum temperatures are likely to be above average in Far West NSW and lower than usual along the coast.

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) for December

- 22-28 December 2022

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.

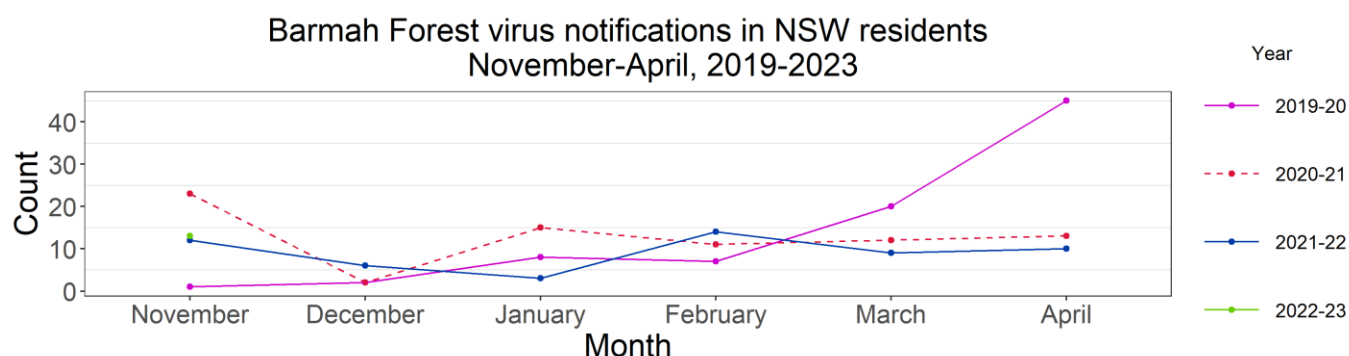
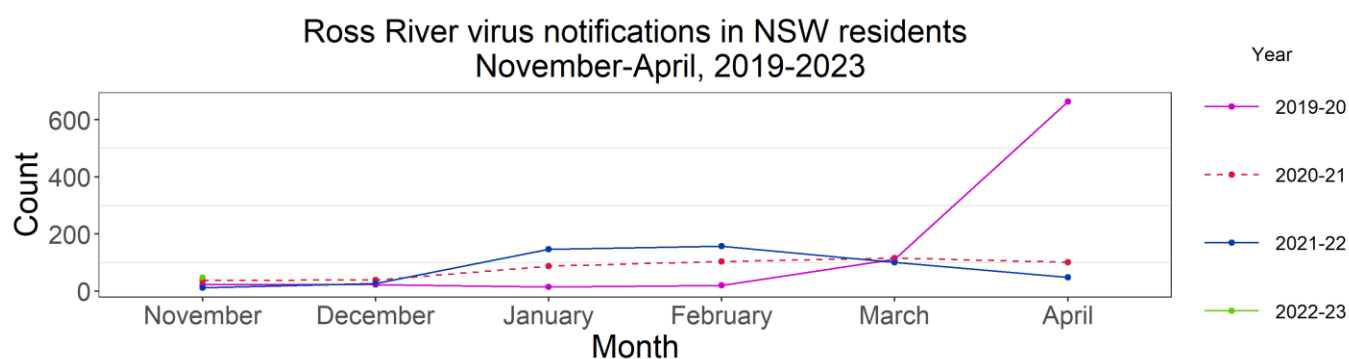
Recent notifications of Ross River virus and Barmah Forest virus infections in humans

(by date of case report received)

	Week		
	Latest week (13 – 19 Nov 2022)	1-week prior (6 – 12 Nov 2022)	2-weeks prior (30 Oct – 5 Nov 2022)
Ross River virus	5	18	11
Barmah Forest virus	3	3	1

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 9 December 2022). 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.