

NSW Arbovirus Surveillance & Mosquito Monitoring 2022-2023

Weekly Update: Week ending 17 December 2022

(Report Number 10)



Summary

Arbovirus Detections

- **Sentinel Chickens:** There were no arbovirus detections in sentinel chickens.
- **Mosquito Isolates:** Barmah Forest virus was detected in mosquitoes collected at Grong Grong.

Mosquito Abundance

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

Environmental Conditions

- **Climate:** In the week ending 17 December 2022, rainfall totals were low in central and western NSW and low to moderate in the east. Average rainfall is predicted for NSW in January 2023. Minimum temperatures are predicted to be about average for January in NSW. Maximum temperatures are likely to be about average in inland NSW and lower than usual along the coast.
- **Tides:** High tides over 1.8 metres are predicted for 22-28 December and 20-25 January, 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. A high proportion of the mosquitoes collected inland have been 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 Penrith. 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*
(Copyright 2020)

Arbovirus Detections

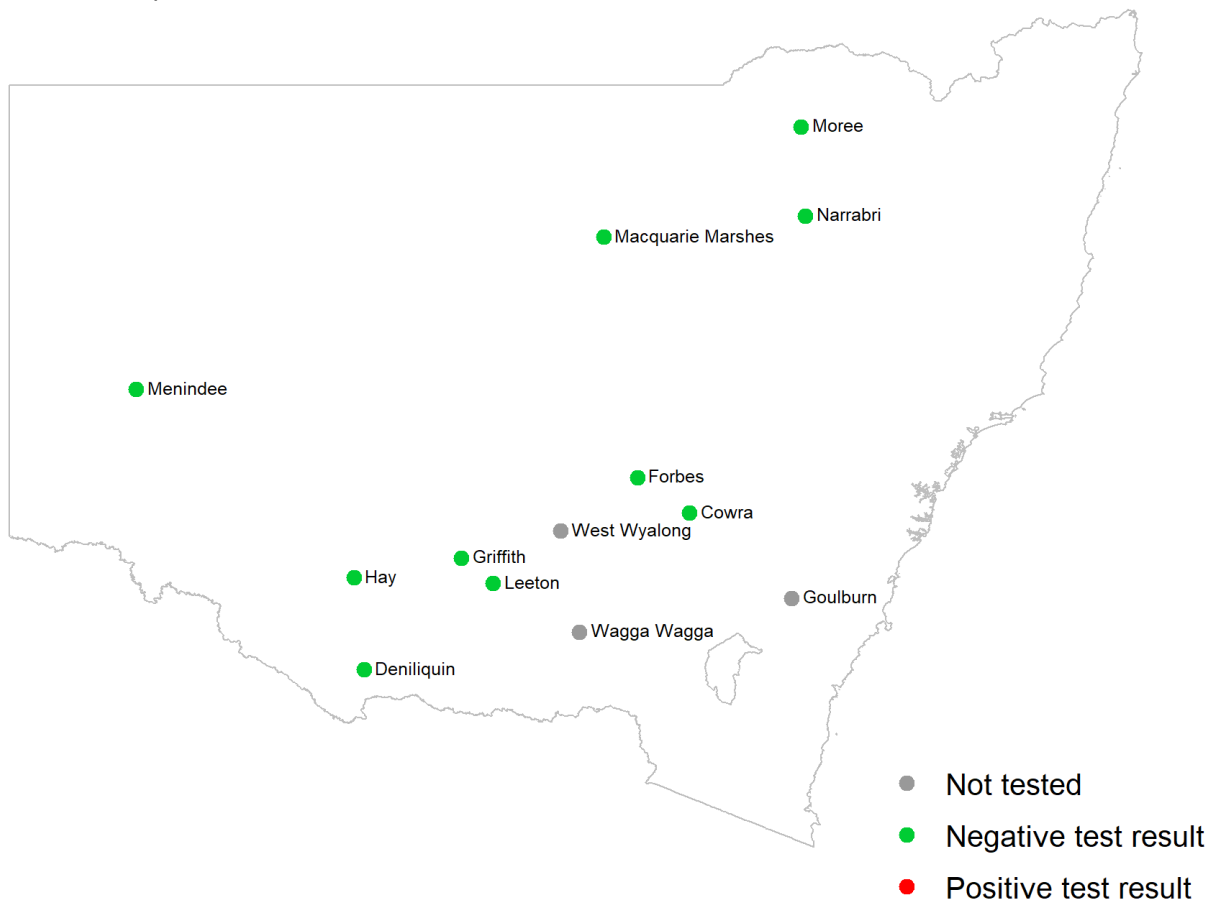
This section details detections of Murray Valley encephalitis virus, Kunjin virus, Ross River virus, Barmah Forest virus and Japanese encephalitis virus in the NSW Arbovirus Surveillance and Mosquito Monitoring Program.

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 17 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		

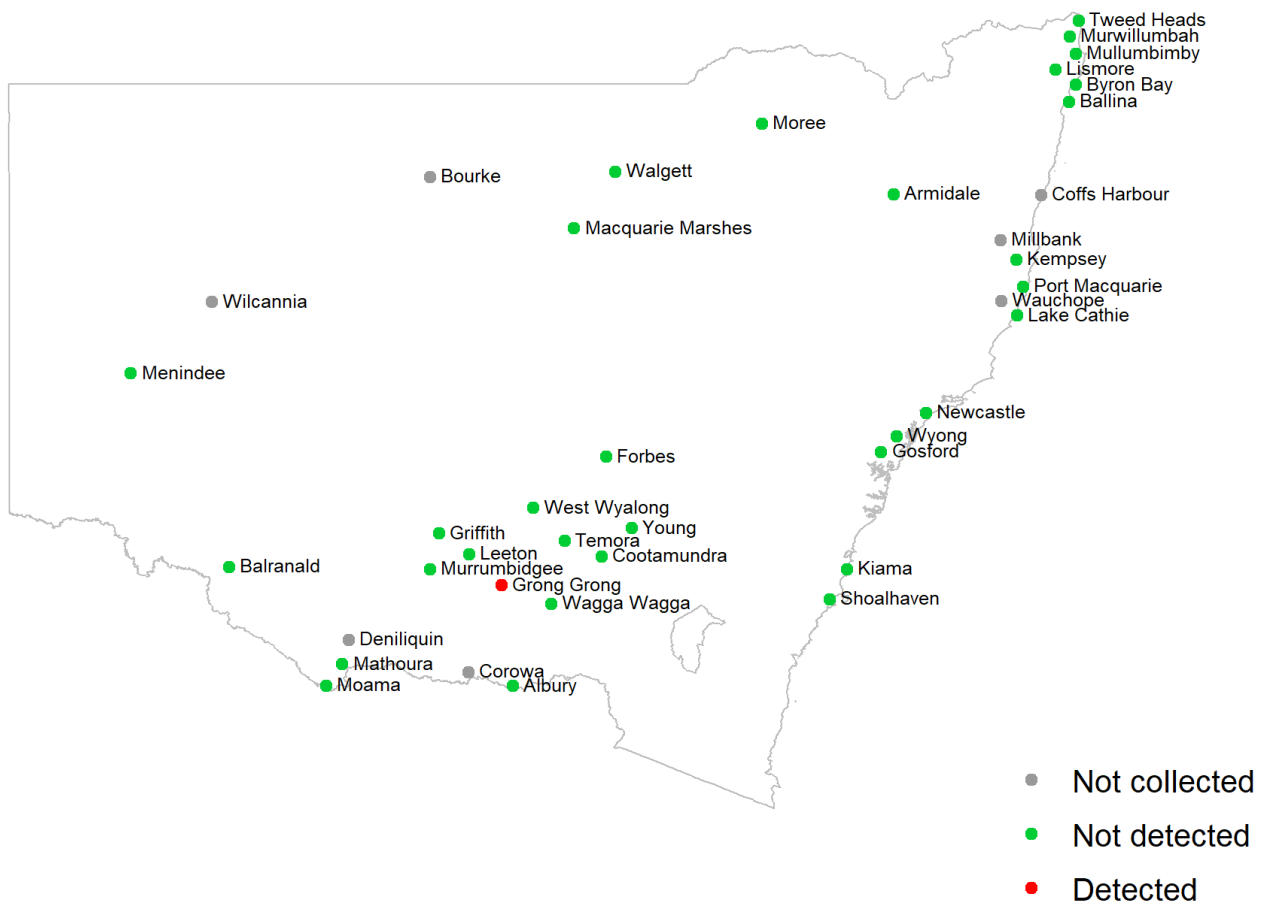
Mosquito isolates

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.

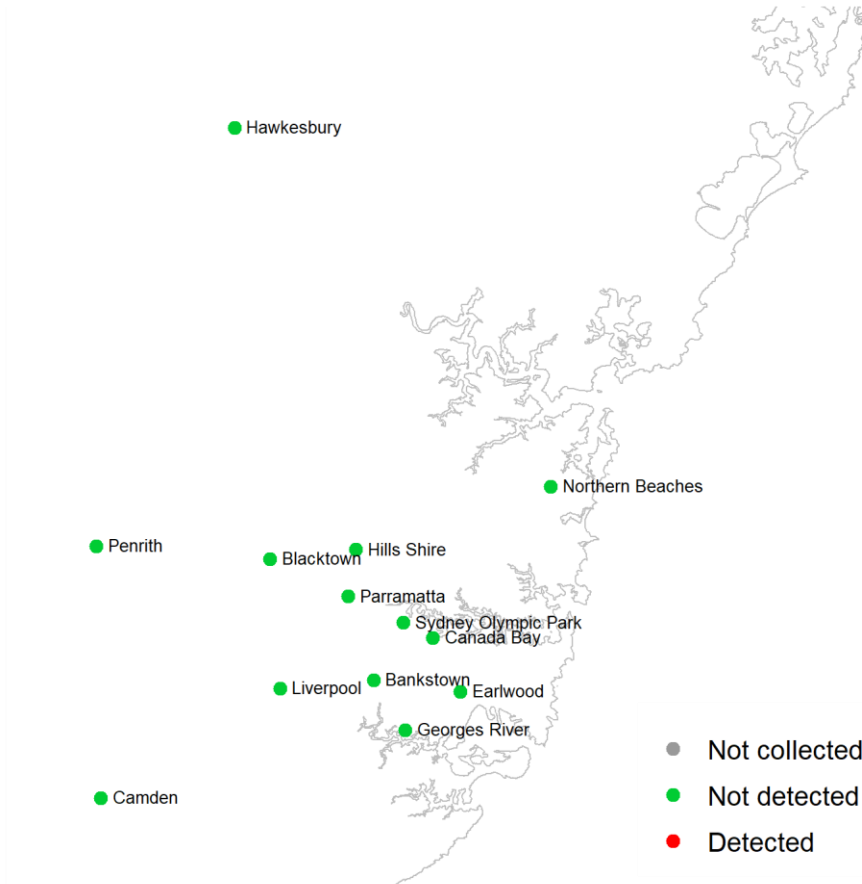
Test results for mosquito trapping sites reported in the week ending 17 December 2022

Barmah Forest virus was detected in mosquitoes collected at Grong Grong.

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

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

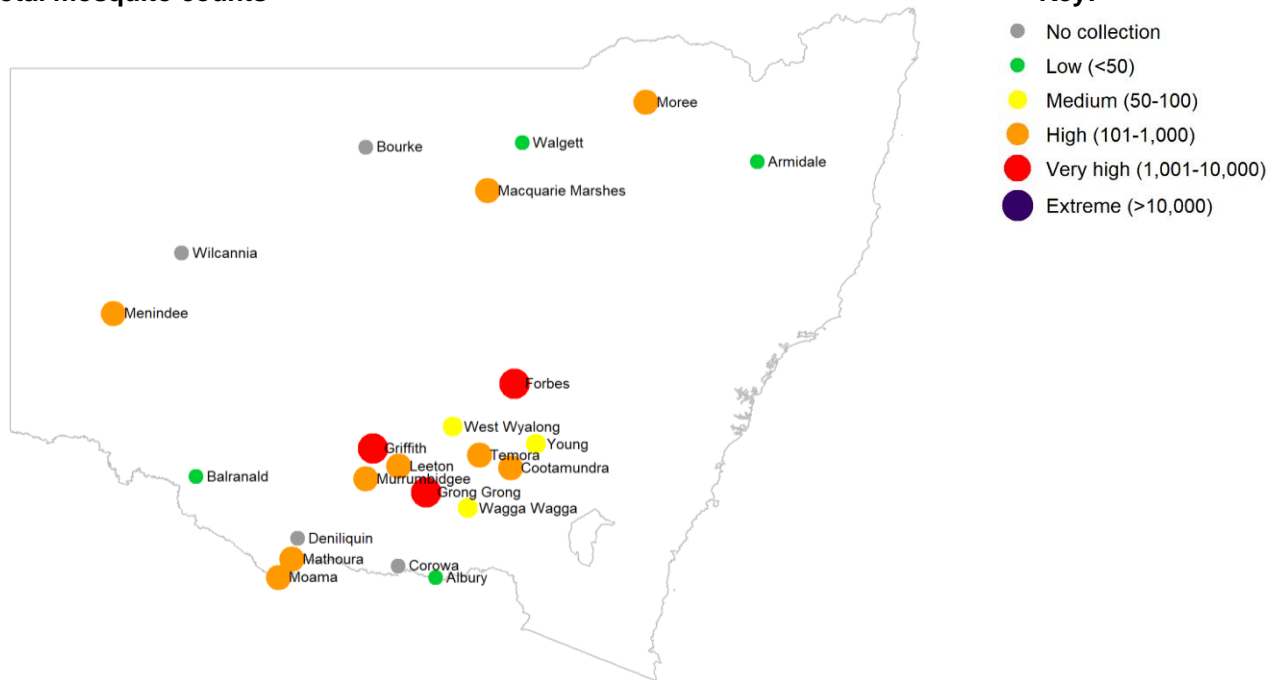
This section details counts of mosquitoes in the NSW Arbovirus Surveillance and Mosquito Monitoring Program. Each location represents the count average for all trapping sites at that location for the most recent week that collections were provided prior to preparation of this report.

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.

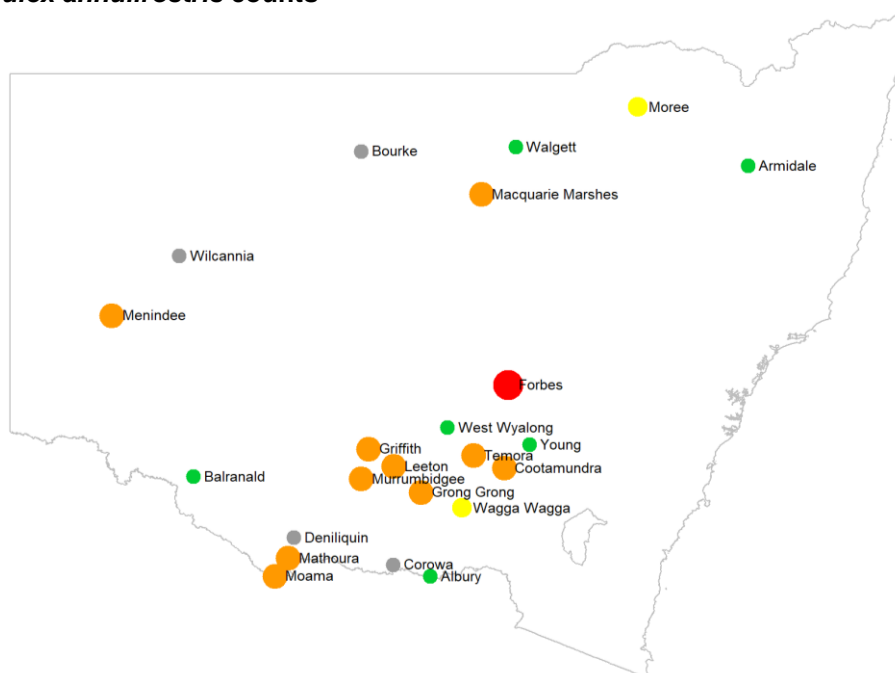
Mosquito counts (average per trap per location) for mosquito trapping sites reported in the week ending 17 December 2022

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**



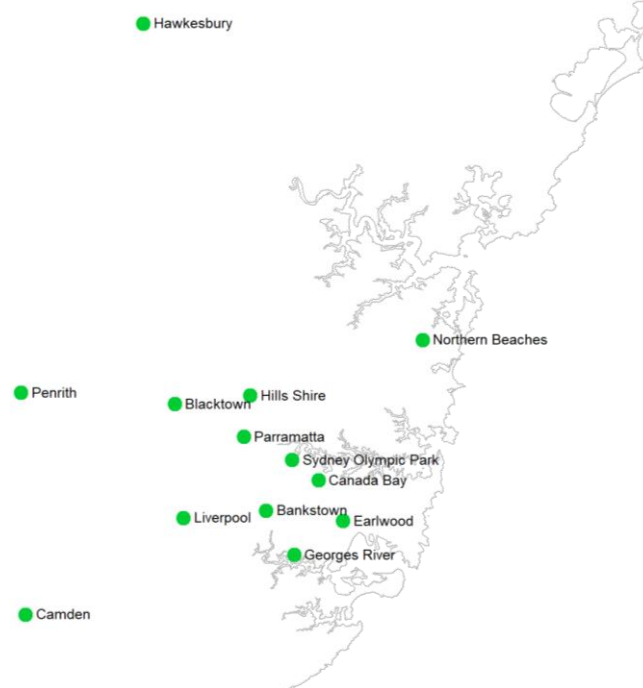
***Aedes vigilax* counts**



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	<i>Cx. annul</i>																															
	Total																															
Armidale	<i>Cx. annul</i>																															
	Total																															
Balranald	<i>Cx. annul</i>																															
	Total																															
Bourke	<i>Cx. annul</i>																															
	Total																															
Cootamundra	<i>Cx. annul</i>																															
	Total																															
Corowa	<i>Cx. annul</i>																															
	Total																															
Deniliquin	<i>Cx. annul</i>																															
	Total																															
Forbes	<i>Cx. annul</i>																															
	Total																															
Griffith	<i>Cx. annul</i>																															
	Total																															
Grong Grong	<i>Cx. annul</i>																															
	Total																															
Leeton	<i>Cx. annul</i>																															
	Total																															
Macquarie Marshes	<i>Cx. annul</i>																															
	Total																															
Mathoura	<i>Cx. annul</i>																															
	Total																															
Menindee	<i>Cx. annul</i>																															
	Total																															
Moama	<i>Cx. annul</i>																															
	Total																															
Moree	<i>Cx. annul</i>																															
	Total																															
Murrumbidgee	<i>Cx. annul</i>																															
	Total																															
Temora	<i>Cx. annul</i>																															
	Total																															
Wagga Wagga	<i>Cx. annul</i>																															
	Total																															
Walgett	<i>Cx. annul</i>																															
	Total																															
West Wyalong	<i>Cx. annul</i>																															
	Total																															
Wilcannia	<i>Cx. annul</i>																															
	Total																															
Young	<i>Cx. annul</i>																															
	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	Cx. annul																															
	Ae. vigilax																															
	Total																															
Byron Bay	Cx. annul																															
	Ae. vigilax																															
	Total																															
Coffs Harbour	Cx. annul																															
	Ae. vigilax																															
	Total																															
Gosford	Cx. annul																															
	Ae. vigilax																															
	Total																															
Kempsey	Cx. annul																															
	Ae. vigilax																															
	Total																															
Kiama	Cx. annul																															
	Ae. vigilax																															
	Total																															
Lake Cathie	Cx. annul																															
	Ae. vigilax																															
	Total																															
Lismore	Cx. annul																															
	Ae. vigilax																															
	Total																															
Millbank	Cx. annul																															
	Ae. vigilax																															
	Total																															
Mullumbimby	Cx. annul																															
	Ae. vigilax																															
	Total																															
Murwillumbah	Cx. annul																															
	Ae. vigilax																															
	Total																															
Newcastle	Cx. annul																															
	Ae. vigilax																															
	Total																															
Port Macquarie	Cx. annul																															
	Ae. vigilax																															
	Total																															
Shoalhaven	Cx. annul																															
	Ae. vigilax																															
	Total																															
Tweed Heads	Cx. annul																															
	Ae. vigilax																															
	Total																															
Wauchope	Cx. annul																															
	Ae. vigilax																															
	Total																															
Wyong	Cx. annul																															
	Ae. vigilax																															
	Total																															

Sydney

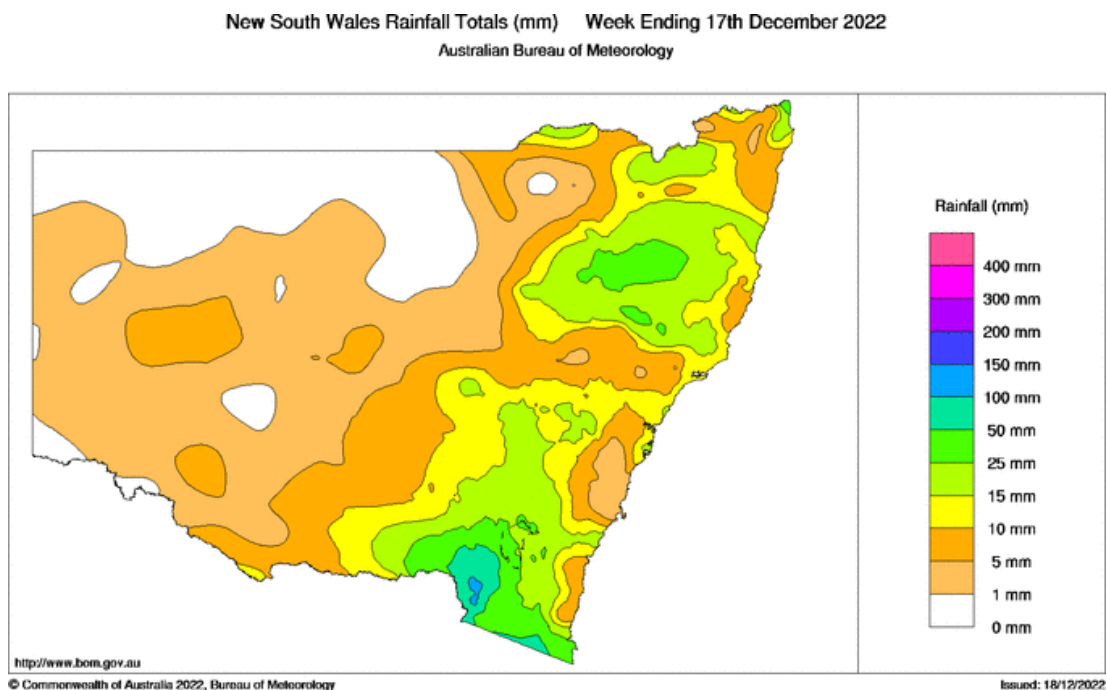
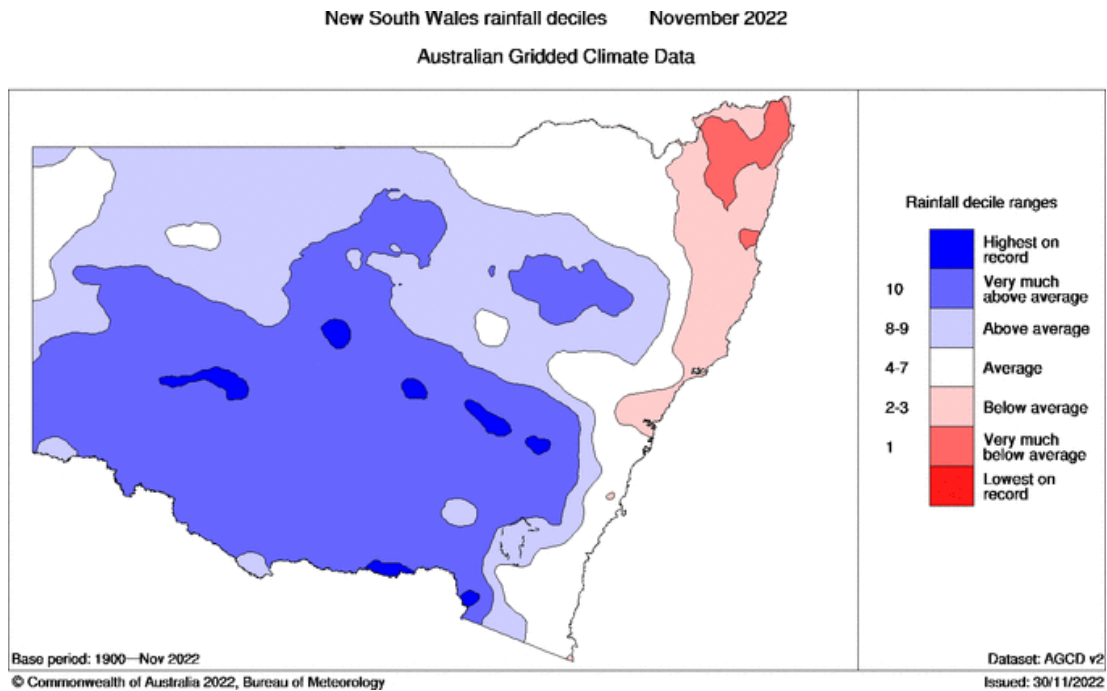
		WEEK ENDING																														
		Oct-22			Nov-22				Dec-22					Jan-23				Feb-23				Mar-23				Apr-23			May-23			
Location	Mosquito	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22	29	6	13
Bankstown	<i>Cx. annul</i>																															
	<i>Ae. vigilax</i>																															
	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 17 December 2022, rainfall totals were low in central and western NSW and low to moderate in the east.



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 about average in NSW for January. Maximum temperatures are likely to be about average in inland 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)

- 22-28 December 2022
- 20-25 January 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.

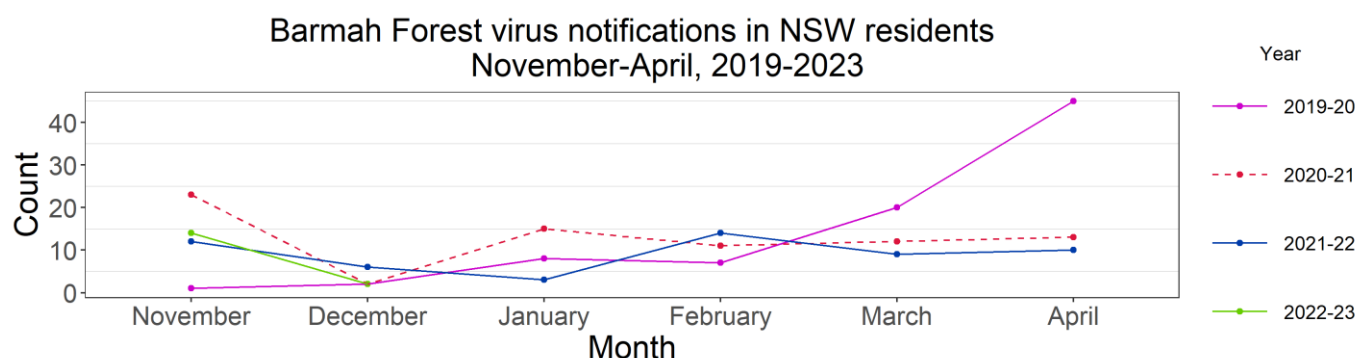
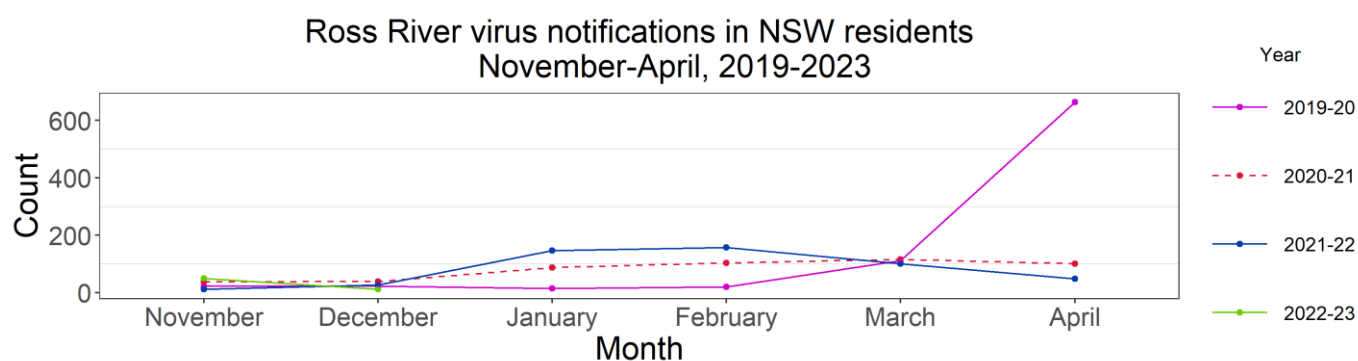
Recent notifications of Ross River virus and Barmah Forest virus infections in humans

(by date of case report received)

	Week		
	Latest week (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 19 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.