

Florida Arbovirus Surveillance Week 4: January 19-25, 2020

Arbovirus surveillance in Florida includes endemic mosquito-borne viruses such as West Nile virus (WNV), Eastern equine encephalitis virus (EEEV), and St. Louis encephalitis virus (SLEV), as well as exotic viruses such as dengue virus (DENV), chikungunya virus (CHIKV), Zika virus (ZIKV), and California encephalitis group viruses (CEV). Malaria, a parasitic mosquito-borne disease is also included. During the period of January 19-25, 2020, the following arboviral activity was recorded in Florida.

This report contains information for 2019 and 2020.

WNV activity: No human cases of WNV infection were reported this week. No horses with WNV infection were reported this week. Nineteen sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Nassau, Orange, Palm Beach, Pasco, Polk, Sarasota, St. Johns, and Volusia counties. In 2020, 15 sentinel chickens have been reported from five counties. In 2019, positive samples from two humans, one blood donor, ten horses, one eagle, and 808 sentinel chickens have been reported from 31 counties.

SLEV activity: No human cases of SLEV infection were reported this week. No sentinel chickens tested positive for antibodies to SLEV this week. In 2020, no positive samples have been reported. In 2019, positive samples from eight sentinel chickens have been reported from eight counties.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. One mosquito pool tested positive for EEEV this week in Miami-Dade County. Two sentinel chickens tested positive for antibodies to EEEV this week in Orange County. In 2020, three sentinel chickens and one mosquito pool have been reported from three counties. In 2019, positive samples from 28 horses, one emu, one eagle, and 115 sentinel chickens have been reported from 31 counties.

International Travel-Associated Dengue Fever Cases: One case of dengue fever was reported this week in a person that had international travel. In 2019, 405 travel-associated cases have been reported.

Dengue Fever Cases Acquired in Florida: No cases of locally acquired dengue fever were reported this week. In 2019, 16 cases of locally acquired dengue fever have been reported.

International Travel-Associated Chikungunya Fever Cases: No cases of chikungunya fever were reported this week in persons that had international travel. In 2019, eight travel-associated cases have been reported.

Chikungunya Fever Cases Acquired in Florida: No cases of locally acquired chikungunya fever were reported this week. In 2019, no cases of locally acquired chikungunya fever have been reported.

International Travel-Associated Zika Fever Cases: No cases of Zika fever were reported this week in persons that had international travel. In 2019, 36 travel-associated cases have been reported.

Zika Fever Cases Acquired in Florida: No cases of locally acquired Zika fever were reported this week. In 2019, no cases of locally acquired Zika fever have been reported.

Advisories/Alerts: Broward County is currently under a mosquito-borne illness advisory. Miami-Dade County is currently under a mosquito-borne illness alert. No other counties are currently under mosquito-borne illness advisory or alert.

There is a Level 2 Travel Health Notice for Nigeria related to the transmission of yellow fever virus. There are also Level 1 Travel Health Notices for Central and South America, Mexico, the Caribbean, Asia, the Pacific Islands, Africa, and the Middle East related to the transmission of dengue virus, for Burundi related to Malaria transmission, and for Ethiopia related to chikungunya transmission. Additional information on travel health

notices can be found at the following link: wwwnc.cdc.gov/travel/notices. For a map of arboviral disease activity in the United States visit: wwwn.cdc.gov/arbonet/maps/ADB_Diseases_Map/index.html.

2019 Human Case Summary*

West Nile Virus Illnesses Acquired in Florida: Two human cases of WNV illness acquired in Florida has been reported in 2019 in Duval (July) and Sumter (October) counties. One asymptomatic positive blood donor has been reported in 2019 from Bay County (August).

International Travel-Associated Chikungunya Fever Cases: Eight cases of chikungunya fever with onset in 2019 have been reported in individuals with travel history to a chikungunya endemic country in the two weeks prior to onset. Countries of origin were: Brazil, Haiti, India (3), and Thailand (3). Counties reporting cases were: Alachua, Lee, Manatee, Marion, Miami-Dade (2), Orange, and Palm Beach. Two cases were reported in non-Florida residents.

International Travel-Associated Dengue Fever Cases: Four hundred five cases of dengue fever with onset in 2019 have been reported in individuals with travel history to a dengue endemic country in the two weeks prior to onset. Counties reporting cases were: Alachua (4), Brevard (2), Broward (47), Charlotte, Citrus, Collier (4), Desoto, Duval (6), Hillsborough (22), Lake (2), Lee (13), Manatee (2), Marion, Miami-Dade (232), Orange (17), Osceola (3), Palm Beach (26), Pasco (4), Pinellas (3), Polk, Putnam, Sarasota (2), Seminole (4), St. Lucie (5), and Volusia. Twenty-six cases were reported in non-Florida residents. Thirteen cases met the criteria for severe dengue (dengue shock syndrome [DSS] or dengue hemorrhagic fever [DHF]). Those at greater risk for DSS and DHF include persons with previous dengue infection, pregnant women, infants, the elderly, and those with co-morbidities. However, severe illness can also occur in those without any of these risk factors. In 2019, 335 cases of dengue reported in Florida have been serotyped by PCR.* Please see the below table for a breakdown of cases by country of origin and serotype.

Country of Exposure	DENV-1	DENV-2	DENV-3	DENV-4	DENV-1/ DENV-2	DENV-1/ DENV-3	DENV-2/ DENV-3	Unknown*	Total
Cuba	18	189			3			34	244
Jamaica		2	20			1		6	29
Dominican Republic	24							4	28
Honduras	2	10	1					5	18
Nicaragua		11					1	5	17
Haiti	7	1						4	12
India		3	3	1				3	10
Mexico	2	3							5
Venezuela	5								5
Brazil		2						1	3
Dominica			2					1	3
El Salvador		2						1	3
Guatemala		1	2						3
Philippines		2						1	3
Belize		2							2
Colombia			1					1	2
Costa Rica		2							2
Thailand		2							2
Vietnam	2								2
Antigua and Barbuda			1						1
Asia	1								1
Bangladesh			1						1
Belize/Cuba/Honduras/Mexico		1							1
Cambodia/Thailand/Vietnam	1								1
Cayman Islands/Mexico		1							1
Central America/Mexico								1	1
Colombia/Venezuela								1	1
Cuba/Jamaica								1	1
India/Malaysia								1	1
Malaysia/Singapore		1							1
Panama	1								1
Total	63	235	31	1	3	1	1	70	405

^{*} Serotyping for 5 cases are pending and will be added in future weeks.

Dengue Fever Cases Acquired in Florida: In 2019, 16 cases of locally acquired dengue fever have been reported in Broward, Hillsborough, and Miami-Dade (14) counties, with onsets in March, July (2), August (3), September (6), October (2), and December (2).

International Travel-Associated Zika Fever Cases: In 2019, 36 cases of Zika fever have been reported in individuals with travel history to a country or area experiencing Zika virus activity. Countries of origin were: Brazil, Colombia (1), Cuba (6), Guatemala (5), Haiti (11), Honduras (4), Jamaica, Nicaragua, Philippines, Puerto Rico, and Venezuela (3). Counties reporting cases were: Broward (5), Collier (3), Duval, Hillsborough (2), Indian River, Lee, Miami-Dade (17), Orange (4), Palm Beach, and Sarasota. Three cases were reported in non-Florida residents. Florida is monitoring a total of 23 pregnant women in 2019.

International Travel-Associated Malaria Cases: Seventy-two cases of malaria with onset in 2019 have been reported. Countries of origin were: Afghanistan, Angola (3), Central African Republic (2), Chad, Congo, Democratic Republic of the Congo (4), Gabon (2), Ghana (10), Guinea, Guyana, India (4), Ivory Coast (6), Kenya (3), Liberia (3), Nicaragua, Nigeria (16), Papua New Guinea, Sierra Leone (2), Sudan, Togo, Uganda (4), Venezuela, and Zambia (3). Counties reporting cases were: Bay, Brevard (3), Broward (6), Duval (10), Hillsborough (5), Lake (2), Lee, Manatee, Miami-Dade (13), Okaloosa, Orange (9), Pasco (6), Pinellas (5), Polk (3), Seminole (4), Volusia and Washington. Twenty cases were reported in non-Florida residents.

Fifty-eight cases (81%) were diagnosed with *Plasmodium falciparum*. Nine cases (13%) were diagnosed with *Plasmodium vivax*. Three cases (4%) were diagnosed with *Plasmodium ovale*. Two cases (3%) were diagnosed with *Plasmodium malariae*.

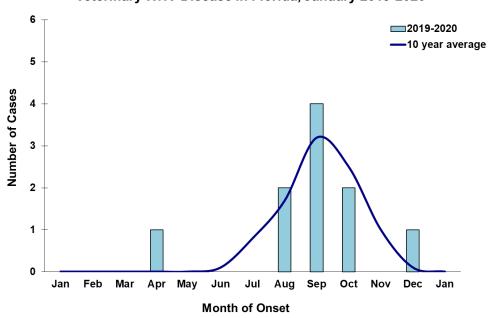
One case of malaria with onset in 2020 has been reported. Country of origin was: Nigeria. County reporting the case was: Miami-Dade. The case was diagnosed with *Plasmodium falciparum*.

Veterinary Cases*

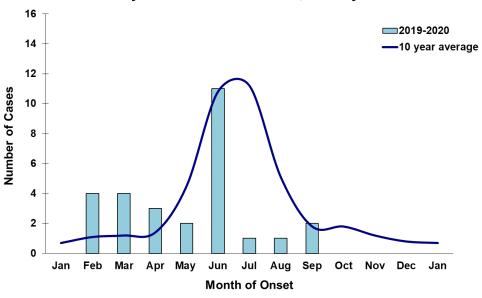
*Veterinary cases are reported by date of onset. Only mammalian veterinary cases are included in the graphs.

No horses with EEEV or WNV infection were reported this week.

Veterinary WNV Disease in Florida, January 2019-2020



Veterinary EEEV Disease in Florida, January 2019-2020



Sentinel Chickens*

The table below is for the reporting of confirmatory laboratory results from this week. Some of the samples were collected at earlier dates. The date of collection is recorded for samples collected on that day along with the total number of positives and the corresponding seroconversion rate for the week the sample was collected.

Nineteen sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Nassau, Orange, Palm Beach, Pasco, Polk, Sarasota, St. Johns, and Volusia counties. Two sentinel chickens tested positive for antibodies to EEEV this week in Orange County.

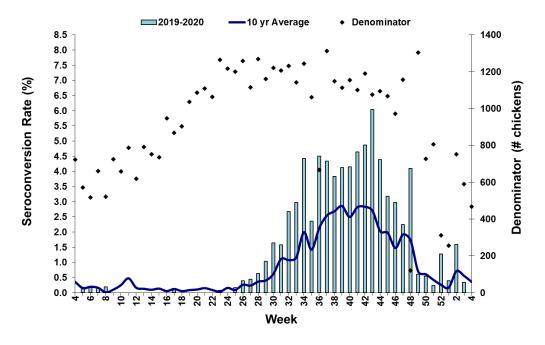
2019

		Seroconversion Rates (%)			Co	ounty Totals			
County	Collection Date	Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Brevard	11/20/2019	3.70		3.70				2 WNV	60 WNV, 1 EEEV
Hillsborough	12/10/2019 12/16/2019	2.00 2.00		2.00 2.00				1 WNV 1 WNV	38 WNV, 1 SLEV
Indian River	11/15/2019	3.23		3.23				1 WNV	72 WNV
Nassau	11/16/2019	5.88		5.88				2 WNV	24 WNV, 9 EEEV
Orange	11/18/2019 12/16/2019	4.04 2.17		4.04 2.17				4 WNV 2 WNV	82 WNV, 7 EEEV
Palm Beach	11/25/2019	8.70		8.70				2 WNV	30 WNV
Pasco	12/11/2019 12/18/2019	4.26 4.00		4.26 4.00				2 WNV 2 WNV	29 WNV
Polk	11/15/2019	6.90		6.90				2 WNV	36 WNV, 5 EEEV
Sarasota	11/15/2019 12/13/2019	6.78 3.45		6.78 3.45				4 WNV 2 WNV	30 WNV, 1 SLEV
St. Johns Volusia	11/18/2019 11/25/2019	3.45 2.13		3.45 2.13				2 WNV 1 WNV	55 WNV, 8 EEEV 64 WNV, 7 EEEV, 1 SLEV

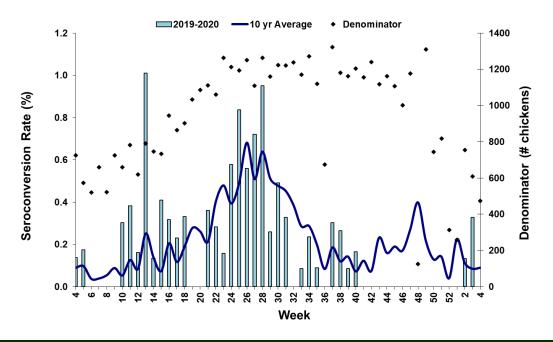
2020

			Seroconversion Rates (%)			County Totals			
County	Collection Date	Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Citrus	1/14/2020	2.70		2.70				2 WNV	6 WNV, 1 EEEV
Orange	1/13/2020				2.17	2.17		2 EEEV	3 WNV. 2 FFFV

Sentinel Seroconversions to WNV in Florida, 2019-2020



Sentinel Seroconversions to EEEV in Florida, 2019-2020



Mosquito Pools

One mosquito pool tested positive for EEEV this week in Miami-Dade County.

County	Collection Date	Result	Species	County YTD
Miami-Dade	1/7/20	EEEV	Cx. quinquefasciatus*	1 EEEV

^{*}While *Cx. quinquefasciatus* can be infected with EEEV, its ability to serve as a competent disease vector is unknown.

Dead Birds

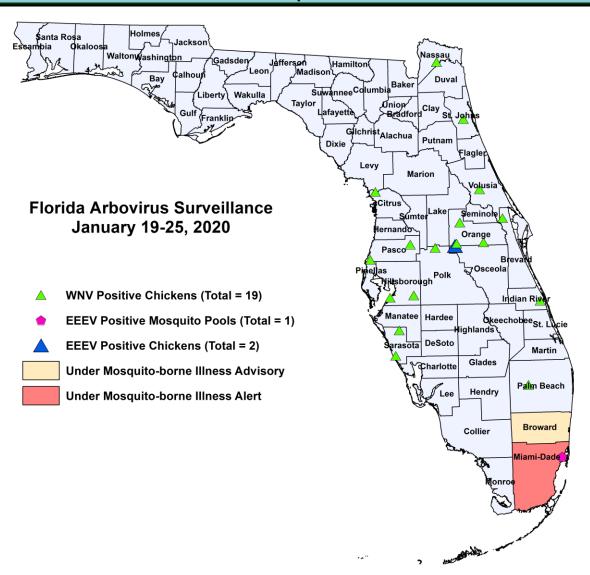
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, six reports representing a total of 30 dead birds were received from six counties.

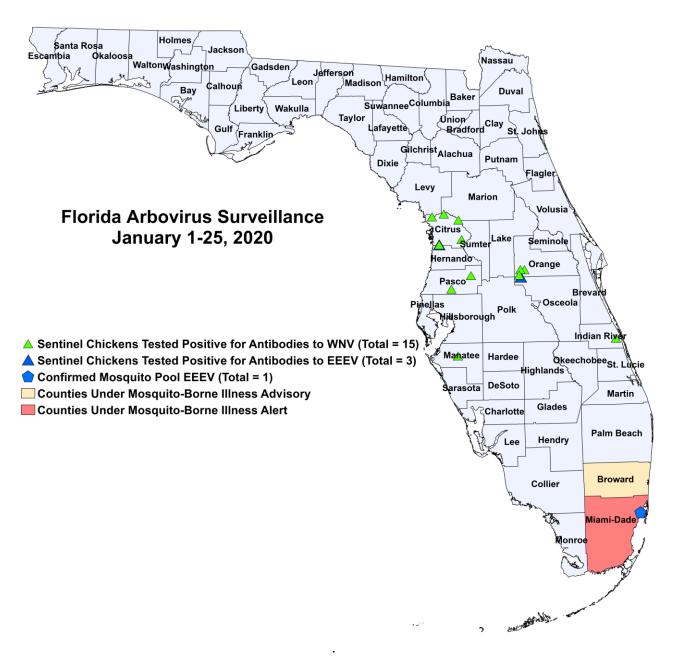
In 2020, 24 reports representing a total of 50 dead birds (8 raptors) were received from 16 of Florida's 67 counties.

2020

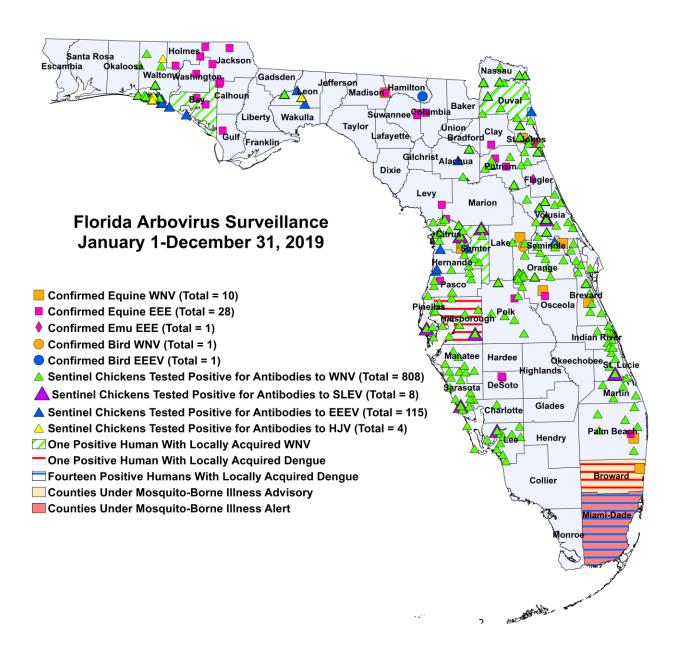
County	Total Dead Birds	Crows	Jays	Raptors	Doves
Charlotte	1	0	0	0	0
Duval	10	0	0	0	0
Pinellas	1	0	0	0	0
Polk	2	0	0	0	0
Santa Rosa	15	0	0	0	0
Sarasota	1	0	0	0	0

Maps





	2020 Arbovirus Activity by County
County	Arbovirus Activity
Citrus	WNV: 6 sentinels (1/8, 1/14) EEEV: 1 sentinel (1/8)
Indian River	WNV: 1 sentinel (1/2)
Manatee	WNV: 3 sentinels (1/8)
Miami-Dade	EEEV: 1 mosquito pool (1/7)
Orange	WNV: 3 sentinels (1/6) EEEV: 2 sentinels (1/13)
Pasco	WNV: 2 sentinels (1/7)



	2019 Arbovirus Activity by County
County	Arbovirus Activity
Alachua	WNV: 5 sentinels (9/9, 9/13, 9/30, 11/18) EEEV: 2 sentinels (7/8, 8/19)
Bay	WNV: 1 asymptomatic blood donor (August) EEEV: 2 horses (2/24, 2/26), 9 sentinels (4/29, 7/1)
Brevard	WNV: 1 horse (8/27), 60 sentinels (1/3, 7/18, 7/19, 7/25, 7/26, 7/31, 8/1, 8/8, 8/14, 8/15, 8/16, 8/21, 8/22, 8/23, 9/12, 9/13, 9/18, 9/19, 9/20, 9/25, 10/9, 10/10, 10/11, 10/17, 10/18, 10/23, 10/24, 11/1, 11/8, 11/13, 11/19, 11/20) EEEV: 1 sentinel (7/18)
Broward	Dengue: 1 human (August) WNV: 1 horse (10/5)
Calhoun	EEEV: 3 horses (3/3, 3/22)
Charlotte	WNV: 11sentinels (7/23, 8/5, 10/18, 10/25, 11/1, 11/7)
Citrus	WNV: 1 horse (9/24), 76 sentinels (1/8, 1/29, 7/23, 8/6, 8/20, 8/27, 9/3, 9/10, 9/17, 9/24, 10/1, 10/8, 10/15, 10/22,10/29, 11/5, 11/12, 11/18, 12/3, 12/10) SLEV: 1 sentinel (10/22) EEEV: 1 horse (5/11), 6 sentinels (4/26, 6/18, 7/30, 9/10, 10/1)
Clay	EEEV: 1 horse (9/20)

Columbia	EEEV: 1 horse (3/30)
DeSoto	EEEV: 2 horses (6/23, 7/2)
Duval	WNV: 1 human (July), 20 sentinels (9/9, 9/23, 10/7, 10/14, 10/21, 10/28, 11/12)
Flagler	EEEV: 1 emu (3/17)
Gulf	EEEV: 1 horse (2/27)
Hamilton	EEEV: 1 eagle (3/21)
Hernando	WNV: 8 sentinels (8/19, 9/9, 9/16, 9/23, 10/7, 10/21, 11/4)
петнанио	EEEV: 2 sentinels (3/4, 9/16)
Hillsborough	Dengue: 1 human (September) WNV: 38 sentinels (8/20, 8/27, 9/3, 9/10, 9/17, 9/24, 10/1, 10/8, 10/15, 10/21, 10/22, 10/29, 11/5, 11/12, 12/3, 12/10, 12/16, 12/23) SLEV: 1 sentinel (10/15)
Holmes	EEEV: 3 horses (6/1, 6/5, 6/20)
Indian River	WNV: 72 sentinels (1/10, 7/3, 7/5, 7/12, 719, 7/26, 8/2, 8/8, 8/9, 8/15, 8/16, 8/22, 8/23, 8/29, 9/5, 9/13, 9/19, 9/20, 10/3, 10/4, 10/10, 10/17, 10/18, 10/25, 10/30, 10/31, 11/7, 11/8, 11/15, 11/22, 11/26, 12/6, 12/27)
Jackson	EEEV: 1 horse (6/19)
Lake	WNV: 1 horse (10/6)
Lee	WNV: 40 sentinels (7/9, 8/5, 8/6, 8/12, 8/19, 8/20, 8/27, 9/4, 9/9, 9/12, 9/16, 9/17, 9/26, 9/27, 9/30, 10/1, 10/7, 10/15, 10/28, 10/29, 11/5) SLEV: 1 sentinel (9/4)
Leon	WNV: 2 sentinels (9/3, 10/14) EEEV: 7 sentinels (5/28, 6/10, 8/26, 9/10, 9/30) HJV: 1 sentinel (8/19)
Levy	EEEV: 1 horse (6/19)
Madison	WNV: 1 horse (4/1) EEEV: 1 horse (4/1)
Manatee	WNV: 9 sentinels (2/5, 10/7, 10/15, 10/22, 11/5, 11/20)
Martin	WNV: 23 sentinels (8/16, 8/29, 9/13, 9/20, 10/11, 10/25, 11/1, 11/15, 11/22, 11/25, 12/20)
Miami-Dade	Dengue: 14 humans (March, July (2), August (2), September (5), October (2) December (2))
Nassau	WNV: 24 sentinels (8/3, 8/17, 8/24, 9/7, 9/14, 9/21, 9/28, 10/12, 10/19, 10/26, 11/2, 11/9, 11/16) EEEV: 9 sentinels (6/21, 7/13, 7/27, 8/3, 9/21, 11/23)
Orange	WNV: 1 eagle (6/22), 82 sentinels (1/7, 1/10, 1/14, 6/27, 6/20, 6/24, 7/1, 7/11, 7/22, 8/1, 8/8, 8/19, 8/22, 8/26, 9/9, 9/16, 9/23, 9/30, 10/7, 10/14, 10/21, 10/28, 11/4, 11/11, 11/18, 11/19, 12/2, 12/16) EEEV: 7 sentinels (6/17, 7/11, 7/18, 7/25, 11/25)
Osceola	WNV: 1 horse (8/30) EEEV: 1 horse (6/10)
Palm Beach	WNV: 30 sentinels (7/8, 7/22, 8/5, 8/19, 9/9, 9/16, 9/23, 10/7, 10/21, 10/28, 11/25) EEEV: 2 horses (2/25, 12/3)
Pasco	WNV: 29 sentinels (8/28, 9/4, 9/24, 10/1, 10/9, 10/23, 10/30, 11/6, 11/13, 11/20, 11/25, 12/4, 12/11, 12/18, 12/23) EEEV: 1 horse (6/20)
Pinellas	WNV: 12 sentinels (8/26, 9/9, 10/14, 10/21, 11/4, 11/12, 11/18) SLEV: 1 sentinel (9/30)
Polk	WNV: 36 sentinels (7/8, 7/15, 7/22, 7/29, 8/5, 8/12, 8/16, 8/19, 8/29, 8/30, 9/6, 9/13, 9/24, 9/30, 10/14, 10/22, 10/25, 10/28, 11/1, 11/4, 11/12, 11/15) EEEV: 1 horse (4/24), 5 sentinels (5/21, 5/24, 5/31, 6/21, 6/28)
Putnam	WNV: 19 sentinels (6/24, 7/17, 7/24, 8/2, 8/7, 8/8, 8/16, 8/23, 9/13, 10/10) EEEV: 2 horses (4/28, 8/17), 4 sentinels (5/29, 6/12, 7/24, 9/13)
Sarasota	WNV: 30 sentinels (2/15, 2/22, 7/29, 8/9, 8/19, 8/23, 9/3, 9/6, 9/10, 9/13, 9/16, 9/20, 10/7, 10/11, 10/14, 10/21, 11/1, 11/8. 11/12, 11/15, 11/22, 12/13, 12/26) SLEV: 1 sentinel (10/18)
Seminole	WNV: 18 sentinels (6/3, 7/15, 7/29, 8/20, 8/26, 9/9, 9/16, 9/23, 10/14, 11/18) EEEV: 1 sentinel (4/8)
St. Johns	WNV: 2 horses (9/7, 9/20), 55 sentinels (7/1, 7/19, 7/29, 8/5, 8/12, 8/19, 8/26, 9/23, 9/30, 10/7, 10/14, 10/21, 10/28, 11/4, 11/18, 11/25) EEEV: 1 horse (9/7), 8 sentinels (4/8, 4/15, 6/3, 6/24, 7/8, 7/29, 8/12, 8/19)

St. Lucie	WNV: 12 sentinels (8/1, 8/8, 8/15, 8/26, 9/6, 9/12, 9/25, 9/26, 10/3) SLEV: 1 sentinel (11/13)
Sumter	WNV: 1 human (October), 12 sentinels (1/8, 9/18, 9/25, 10/4, 10/11, 10/28, 10/29, 11/13, 11/19) SLEV: 1 sentinel (9/25) EEEV: 1 sentinel (8/22)
Suwannee	EEEV: 2 horses (6/4, 6/7)
Volusia	WNV: 1 horse (9/10), 64 sentinels (6/17, 6/24, 7/1, 7/15, 7/22, 7/29, 8/5, 8/12, 8/12, 8/19, 8/26, 9/2, 9/9, 9/17, 9/23, 9/30, 10/7, 10/15, 10/18, 10/21, 11/11, 11/25) SLEV: 1 sentinel (10/21) EEEV: 7 sentinels (1/14, 1/22, 1/28, 7/1, 7/15, 12/9, 12/30)
Walton	WNV: 21 sentinels (4/23, 8/5, 8/26, 9/3, 9/17, 9/23, 9/30, 10/1, 10/14, 10/21, 10/29, 11/12, 11/18, 11/19, 12/2) EEEV: 45 sentinels (3/5, 3/11, 3/12, 3/18, 3/25, 3/26, 4/1, 4/9, 4/15, 4/23, 5/20, 6/3, 6/10, 6/17, 6/24, 7/1, 7/8, 7/22, 7/23, 9/9, 9/16, 9/23) HJV: 3 sentinels (6/3, 7/9, 7/29)
Washington	EEEV: 2 horses (5/28, 6/19)

Acknowledgements and Data Sources

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For more surveillance information, please see the DOH website at: www.floridahealth.gov/diseases-and-conditions/mosquito-borne-diseases/surveillance.html

For arbovirus surveillance information for the United States, please see the Centers for Disease Control and Prevention website at: www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm

Case tallies included in the weekly Florida arbovirus surveillance report include confirmed and probable cases for EEE, WNV infection, SLE, dengue, chikungunya, and malaria by date of onset. Suspect cases are not included. Activity is mapped by county of exposure rather than county of residence. Case definitions being used in Florida are consistent with national criteria provided by the Council of State and Territorial Epidemiologists (CSTE) and may be viewed at: https://www.floridahealth.gov/diseases-and-conditions/disease-reporting-and-management/disease-reporting-and-surveillance/index.html. Case tallies reported by CDC do not include suspect cases and cases are reported by patient state of residence rather than where the exposure occurred. Data is provided by county health departments, Department of Health Bureau of Public Health Laboratories, Department of Agriculture and Consumer Services, mosquito control agencies, Florida Fish and Wildlife Conservation Commission, medical providers and veterinarians. Equine cases are provided by the Department of Agriculture and Consumer Services.