



Florida Arbovirus Surveillance Week 49: December 1-7, 2019

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 December 1-7, 2019, the following arboviral activity was recorded in Florida.

WNV activity: No human cases of WNV infection were reported this week. No horses with WNV infection were reported this week. Six sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Pasco, Sumter, and Walton counties. In 2019, positive samples from two humans, one blood donor, nine horses, one eagle, and 734 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 2019, positive samples from four sentinel chickens have been reported from four counties.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. No sentinel chickens tested positive for antibodies to EEEV this week. In 2019, positive samples from 28 horses, one emu, one eagle, and 110 sentinel chickens have been reported from 31 counties.

International Travel-Associated Dengue Fever Cases: Six cases of dengue fever were reported this week in persons that had international travel. In 2019, 374 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, 14 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: Bay, Broward, Calhoun, Citrus, DeSoto, Duval, Hillsborough, Holmes, Indian River, Lee, Orange, Polk, St. Johns, Sumter, Suwannee, Volusia, and Walton counties are 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, the Middle East, France, and Spain 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: www.cdc.gov/arbovet/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: Three hundred seventy-four 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 (42), Charlotte, Citrus, Collier (4), Duval (5), Hillsborough (22), Lake, Lee (11), Manatee (2), Marion, Miami-Dade (214), Orange (17), Osceola (3), Palm Beach (25), Pasco (4), Pinellas (2), Polk, Putnam, Sarasota (2), Seminole (3), St. Lucie (5), and Volusia. Twenty-three cases were reported in non-Florida residents. Twelve 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, 307 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	15	177			3			33	228
Dominican Republic	21							4	25
Jamaica		2	16			1		5	24
Honduras	1	10	1					5	17
Nicaragua		10					1	4	15
Haiti	7	1						4	12
India		3	3	1				3	10
Venezuela	5								5
Mexico	1	2						1	4
Brazil		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
Dominica			1					1	2
Thailand		2							2
Vietnam	2								2
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
India/Malaysia								1	1
Malaysia/Singapore		1							1
Panama	1								1
Total	55	221	25	1	3	1	1	67	374

* Serotyping for 13 cases are pending and will be added in future weeks.

Dengue Fever Cases Acquired in Florida: In 2019, 14 cases of locally acquired dengue fever have been reported in Broward, Hillsborough, and Miami-Dade (12) counties, with onsets in March, July (2), August (3), September (6), and October (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: Sixty cases of malaria with onset in 2019 have been reported. Countries of origin were: Afghanistan, Angola (3), Central African Republic, Chad, Congo, Democratic Republic of the Congo (4), Gabon, Ghana (7), Guyana, India (4), Ivory Coast (6), Kenya (3), Liberia (3), Nigeria (14), Papua New Guinea, Sudan, Togo, Uganda (3), Venezuela, and Zambia (3). Counties reporting cases were: Brevard (2), Broward (5), Duval (9), Hillsborough (5), Lake (2), Manatee, Miami-Dade (11), Okaloosa, Orange (7), Pasco (4), Pinellas (5), Polk (3), Seminole (3), Volusia and Washington. Eighteen cases were reported in non-Florida residents.

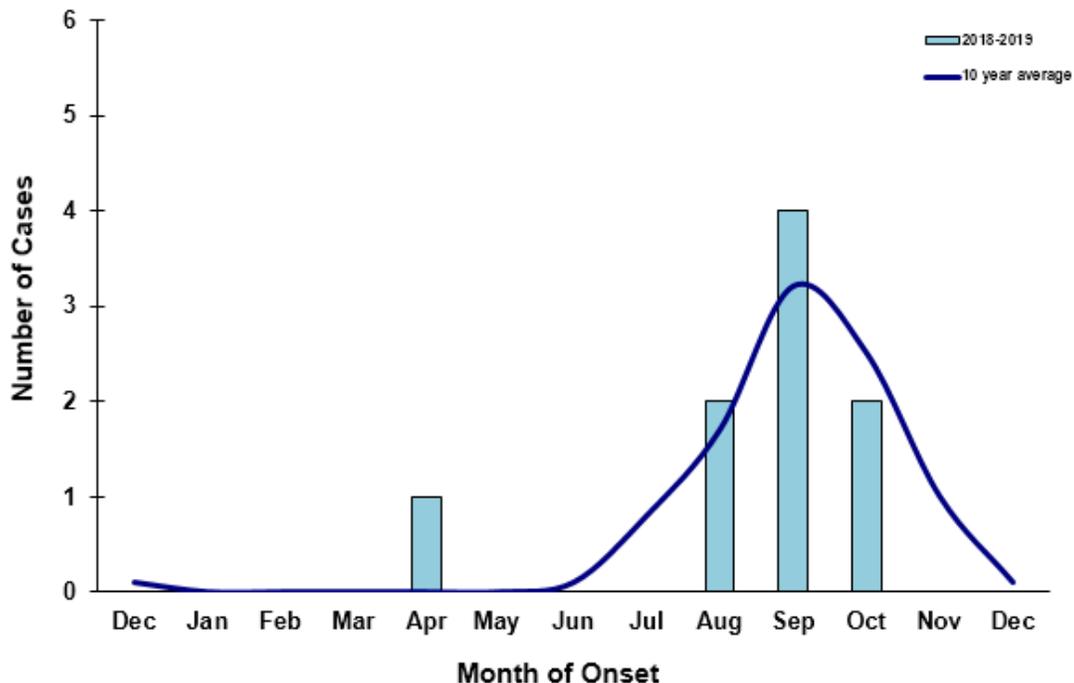
Forty-eight cases (80%) were diagnosed with *Plasmodium falciparum*. Eight cases (13%) were diagnosed with *Plasmodium vivax*. Three cases (5%) were diagnosed with *Plasmodium ovale*. One case (2%) was diagnosed with *Plasmodium malariae*.

Veterinary Cases*

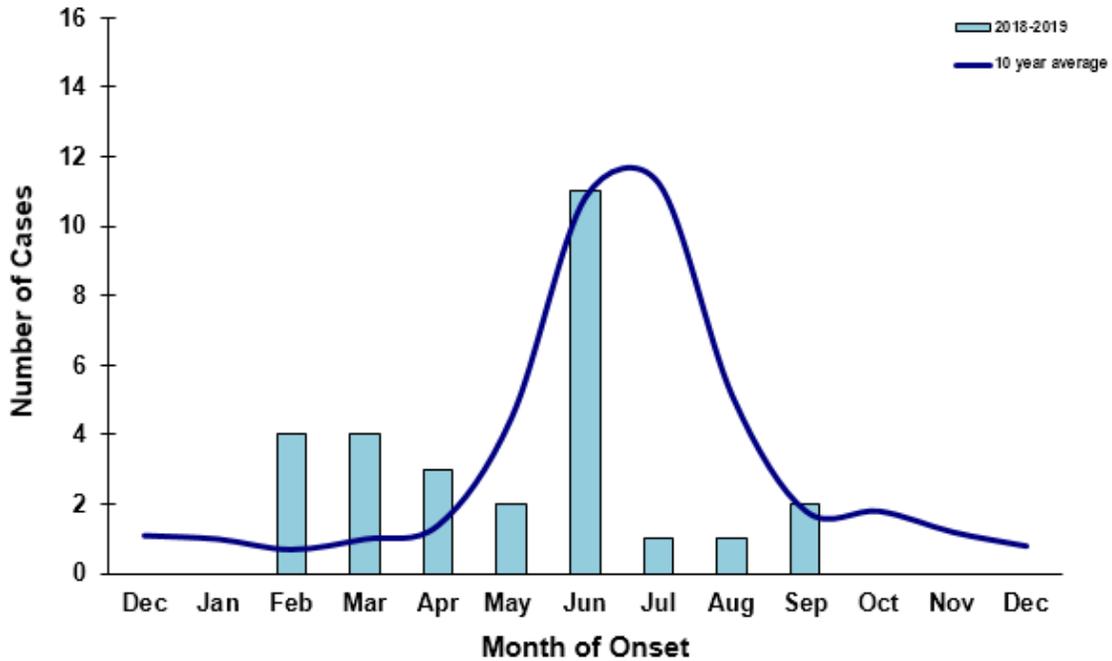
*Veterinary cases are reported by date of onset. Only mammalian veterinary cases are included in the graphs.

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

Veterinary WNV Disease in Florida, December 2018-2019



Veterinary EEEV Disease in Florida, December 2018-2019



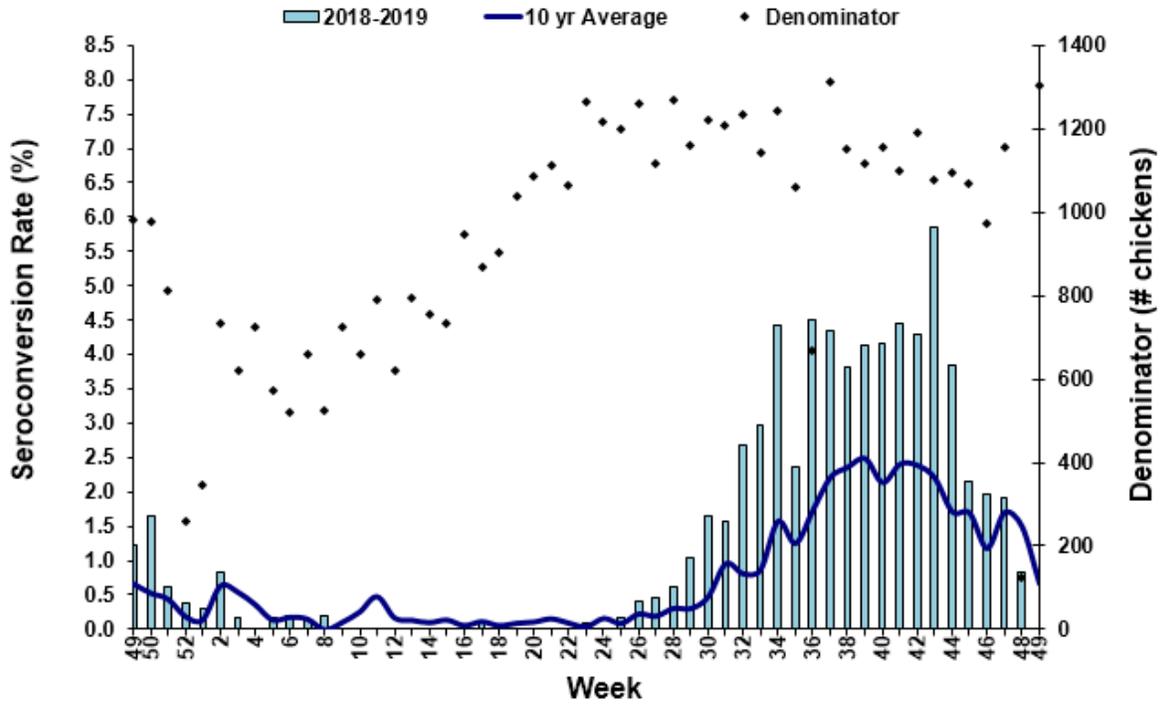
Sentinel Chickens*

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.

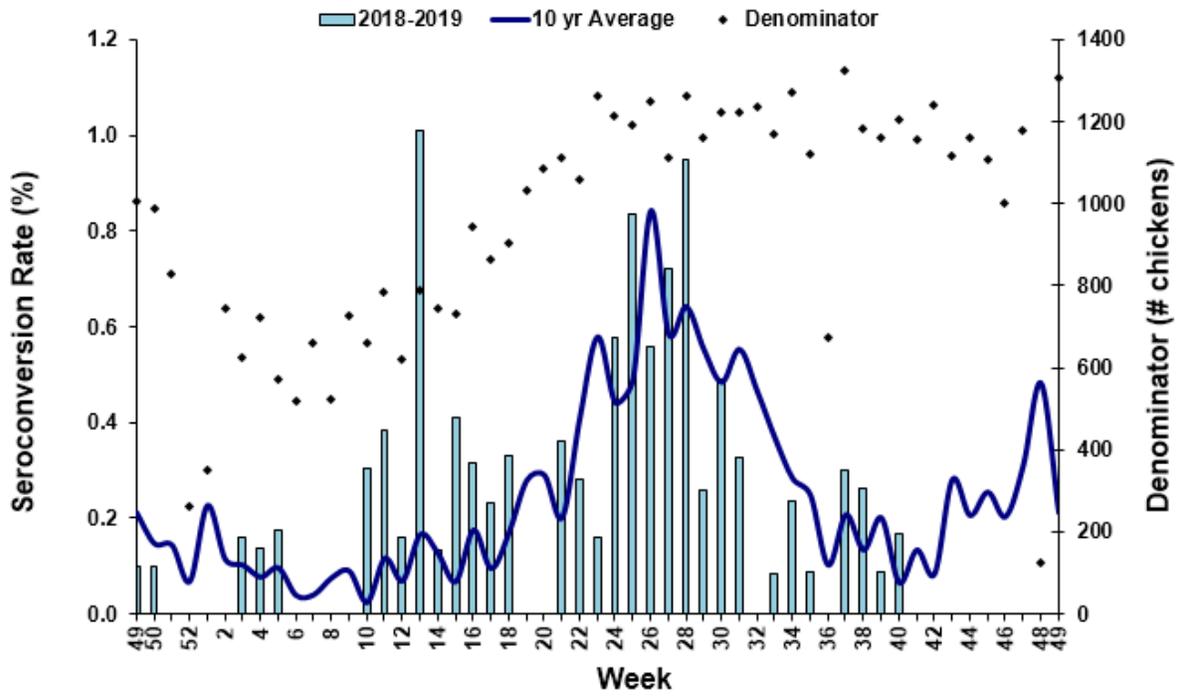
Six sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Pasco, Sumter, and Walton counties.

County	Collection Date	Seroconversion Rates (%)						County Totals	
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Brevard	11/19/19	1.85		1.85				1 WNV	58 WNV, 1 EEEV
Citrus	11/18/19	4.23		4.23				3 WNV	68 WNV, 6 EEEV
Pasco	11/20/19	8.16		8.16				4 WNV	23 WNV
	11/25/19	5.26		5.26				1 WNV	
Sumter	11/19/19	2.94		2.94				1 WNV	11 WNV, 1 SLEV, 1 EEEV
Walton	11/19/19	2.22		2.22				3 WNV	20 WNV, 45 EEEV, 3 HJV

Sentinel Seroconversions to WNV in Florida, 2018-2019



Sentinel Seroconversions to EEEV in Florida, 2018-2019



Mosquito Pools

No mosquito pools tested positive for EEEV, WNV, or Zika this week.

County	Collection Date	Result	Species	County YTD

Dead Birds

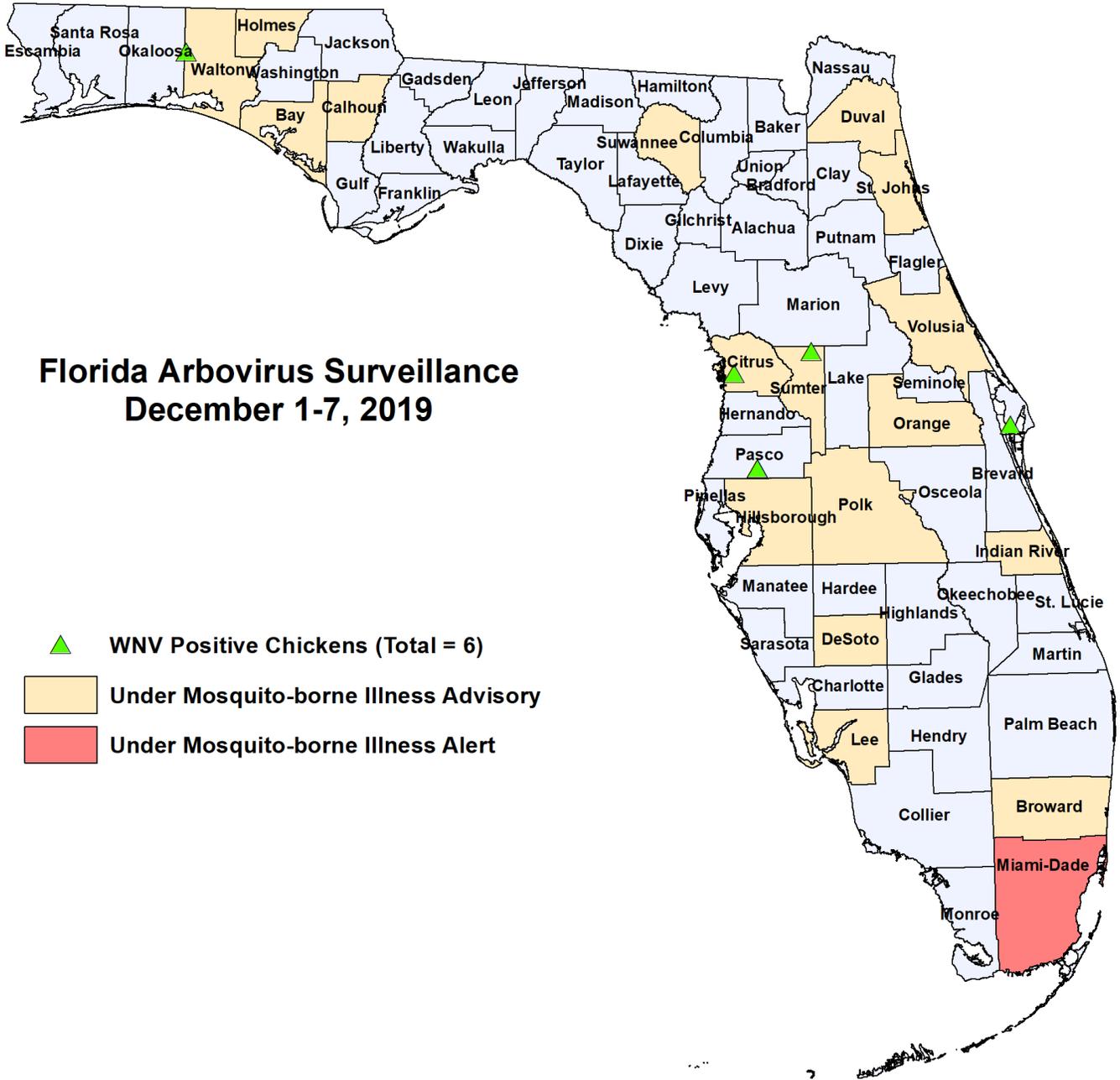
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, seven reports representing a total of 23 dead birds, including 1 raptor and 1 dove, were received from four counties.

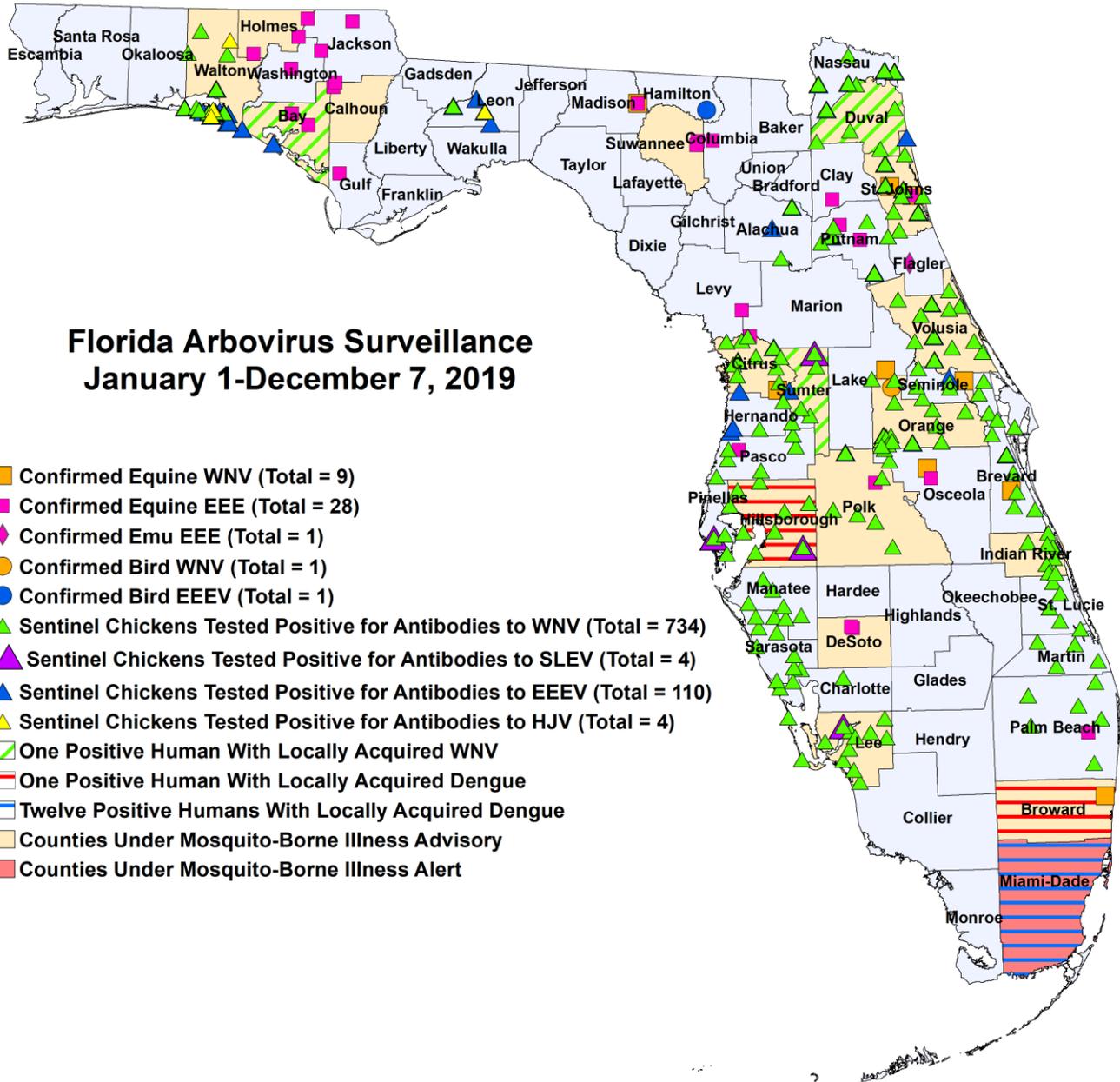
In 2019, 369 reports representing a total of 778 dead birds (14 crows, 15 jays, 85 raptors, and 43 doves) were received from 45 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

2019

County	Total Dead Birds	Crows	Jays	Raptors	Doves
Brevard	16	0	0	0	1
Broward	1	0	0	1	0
Collier	2	0	0	0	0
Palm Beach	4	0	0	0	0

Maps





Florida Arbovirus Surveillance January 1-December 7, 2019

- Confirmed Equine WNV (Total = 9)
- Confirmed Equine EEE (Total = 28)
- ◆ Confirmed Emu EEE (Total = 1)
- Confirmed Bird WNV (Total = 1)
- Confirmed Bird EEEV (Total = 1)
- ▲ Sentinel Chickens Tested Positive for Antibodies to WNV (Total = 734)
- ▲ Sentinel Chickens Tested Positive for Antibodies to SLEV (Total = 4)
- ▲ Sentinel Chickens Tested Positive for Antibodies to EEEV (Total = 110)
- ▲ Sentinel Chickens Tested Positive for Antibodies to HJV (Total = 4)
- ▨ One Positive Human With Locally Acquired WNV
- ▨ One Positive Human With Locally Acquired Dengue
- ▨ Twelve Positive Humans With Locally Acquired Dengue
- Counties Under Mosquito-Borne Illness Advisory
- Counties Under Mosquito-Borne Illness Alert

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), 58 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, 11/13, 11/19) 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: 9 sentinels (7/23, 8/5, 10/18, 10/25, 11/1, 11/7)
Citrus	WNV: 1 horse (9/24), 68 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) 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), 19 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) EEEV: 2 sentinels (3/4, 9/16)
Hillsborough	Dengue: 1 human (September) WNV: 31 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) SLEV: 1 sentinel (10/15)
Holmes	EEEV: 3 horses (6/1, 6/5, 6/20)
Indian River	WNV: 64 sentinels (1/10, 7/3, 7/5, 7/12, 7/19, 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)
Jackson	EEEV: 1 horse (6/19)
Lake	WNV: 1 horse (10/6)
Lee	WNV: 39 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: 19 sentinels (8/16, 8/29, 9/13, 9/20, 10/11, 10/25, 11/1, 11/15)
Miami-Dade	Dengue: 12 humans (March, July (2), August (2), September (5), October (2))
Nassau	WNV: 22 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: 8 sentinels (6/21, 7/13, 7/27, 8/3, 9/21)
Orange	WNV: 1 eagle (6/22), 75 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, 11/11, 11/18, 11/19) EEEV: 6 sentinels (6/17, 7/11, 7/18, 7/25)
Osceola	WNV: 1 horse (8/30) EEEV: 1 horse (6/10)
Palm Beach	WNV: 27 sentinels (7/8, 7/22, 8/5, 8/19, 9/9, 9/16, 9/23, 10/7, 10/21, 10/28) EEEV: 1 horse (2/25)
Pasco	WNV: 23 sentinels (8/28, 9/4, 9/24, 10/1, 10/9, 10/23, 10/30, 11/6, 11/13, 11/20, 11/25) EEEV: 1 horse (6/20)
Pinellas	WNV: 10 sentinels (8/26, 9/9, 10/14, 10/21, 11/4, 11/18) SLEV: 1 sentinel (9/30)
Polk	WNV: 32 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, 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: 23 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, 11/1, 11/12, 11/15)
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), 52 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) 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)
Sumter	WNV: 1 human (October), 11 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), 59 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) EEEV: 5 sentinels (1/14, 1/22, 1/28, 7/1, 7/15)
Walton	WNV: 20 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) 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: 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.