



Florida Arbovirus Surveillance Week 36: September 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 September 1-7, 2019, the following arboviral activity was recorded in Florida.

WNV activity: One human case of WNV infection was reported this week in Duval County. No horses with WNV infection were reported this week. Thirty-two sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Lee, Nassau, Orange, Pasco, Pinellas, Putnam, Sarasota, Seminole, St. Johns, St. Lucie, Volusia, and Walton counties. In 2019, positive samples from one human, one blood donor, one horse, one eagle, and 221 sentinel chickens have been reported from 26 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, no positive samples have been reported.

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 26 horses, one emu, one eagle, and 98 sentinel chickens have been reported from 29 counties.

International Travel-Associated Dengue Fever Cases: Seven cases of dengue fever were reported this week in persons that had international travel. In 2019, 154 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, three 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, five 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: One case of Zika fever was reported this week in a person that had international travel. In 2019, 33 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, Calhoun, Citrus, DeSoto, Duval, Holmes, Indian River, Orange, Polk, Suwannee, 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 are no areas of ongoing, active Zika transmission in Florida. For additional information on current CDC recommendations, please visit www.cdc.gov/zika/intheus/florida-update.html. For additional information on Zika virus cases from 2016–2018, including up-to-date numbers, please visit <https://zikafreefl.org/>.

There are Level 2 Travel Health Notices for Brazil and 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 and for Burundi related to Malaria 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, please visit the following link: wwwn.cdc.gov/arbonet/maps/ADB_Diseases_Map/index.html.

2019 Human Case Summary*

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

International Travel-Associated Chikungunya Fever Cases: Five 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, and Thailand (2). Counties reporting cases were: Alachua, Manatee, Marion, Orange, and Palm Beach. Two cases were reported in non-Florida residents.

International Travel-Associated Dengue Fever Cases: One hundred fifty-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. Countries of origin were: Belize (2), Belize/Cuba/Honduras/Mexico, Brazil (3), Cambodia/Thailand/Vietnam, Central America/Mexico, Colombia, Colombia/Venezuela, Costa Rica (2), Cuba (93), Dominican Republic (6), El Salvador, Guatemala (3), Haiti (3), Honduras (9), India (3), India/Malaysia, Jamaica (9), Malaysia/Singapore, Mexico (2), Nicaragua (5), Philippines, Thailand (2), and Venezuela (3). Counties reporting cases were: Alachua, Brevard, Broward (14), Charlotte, Duval (2), Hillsborough (10), Lake, Lee (4), Manatee, Miami-Dade (87), Orange (9), Osceola, Palm Beach (12), Pasco (3), Pinellas (2), Polk, Putnam, Sarasota, Seminole, and St. Lucie. Eight cases were reported in non-Florida residents. Four 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, 130* cases of dengue reported in Florida have been serotyped by PCR. Additional serotyping and strain typing are being conducted.

	# of cases per serotype – 2019*
DENV-1	18
DENV-2	98
DENV-3	12
DENV-1 & 2	1
DENV-2 & 3	1
Total	130

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

Dengue Fever Cases Acquired in Florida: In 2019, three cases of locally acquired dengue fever have been reported in Miami-Dade County, with onsets in March and July (2).

International Travel-Associated Zika Fever Cases: In 2019, 33 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 (9), Honduras (4), Jamaica, Nicaragua, Philippines, Puerto Rico, and Venezuela (2). Counties reporting cases were: Broward (5), Collier (2), Duval, Hillsborough (2), Indian River, Lee, Miami-Dade (15), Orange (4), Palm Beach, and Sarasota. Three cases were reported in non-Florida residents. Florida is monitoring a total of 20 pregnant women in 2019.

International Travel-Associated Malaria Cases: Forty-five cases of malaria with onset in 2019 have been reported. Countries of origin were: Afghanistan, Angola (2), Congo, Democratic Republic of the Congo (4), Ghana (7), Guyana, India, Ivory Coast (5), Kenya (3), Liberia (2), Nigeria (12), Papua New Guinea, Sudan, Uganda, and Zambia (3). Counties reporting cases were: Brevard, Broward (3), Duval (8), Hillsborough (4),

Lake (2), Miami-Dade (6), Okaloosa, Orange (6), Pasco (3), Pinellas (5), Polk (2), Seminole (3), and Volusia. Eleven cases were reported in non-Florida residents.

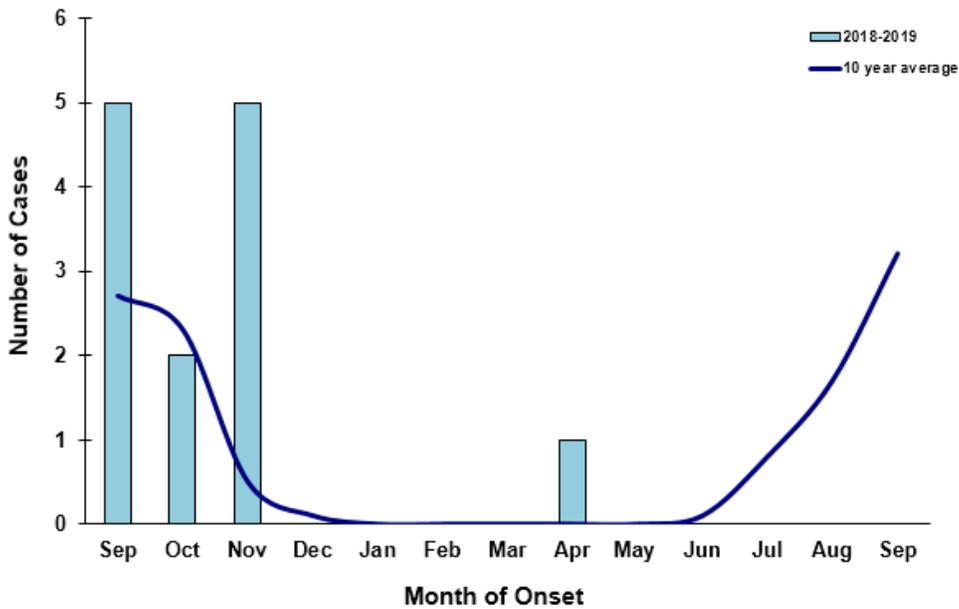
Forty cases (89%) were diagnosed with *Plasmodium falciparum*. Four cases (9%) was diagnosed with *Plasmodium vivax*. One case (2%) was diagnosed with *Plasmodium ovale*.

Veterinary Cases*

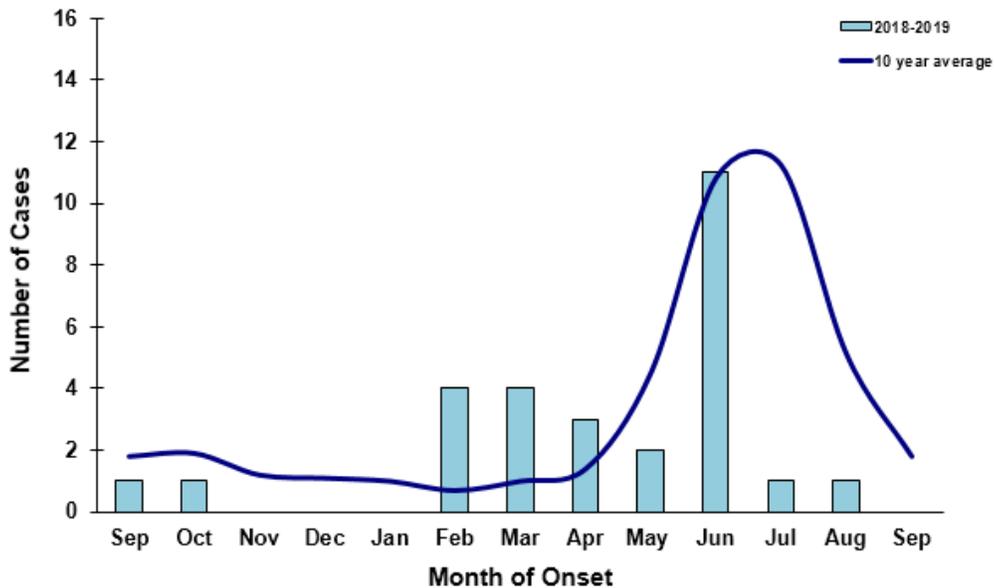
*Veterinary cases are reported by date of onset. Only mammalian veterinary cases are included in the graphs.

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

Veterinary WNV Disease in Florida, September 2018-2019



Veterinary EEEV Disease in Florida, September 2018-2019



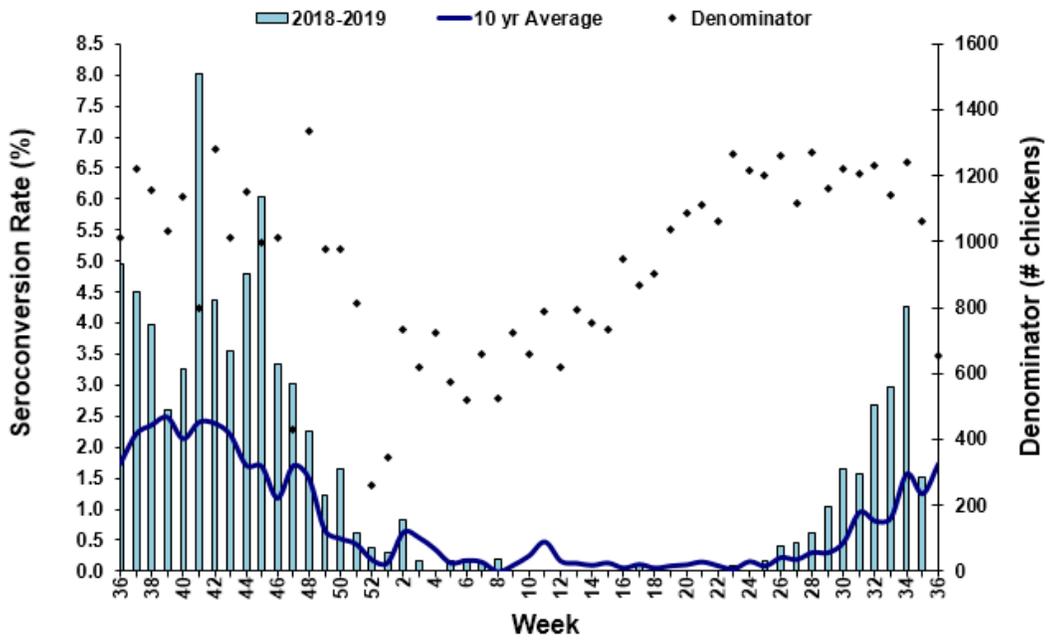
Sentinel Chickens*

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.

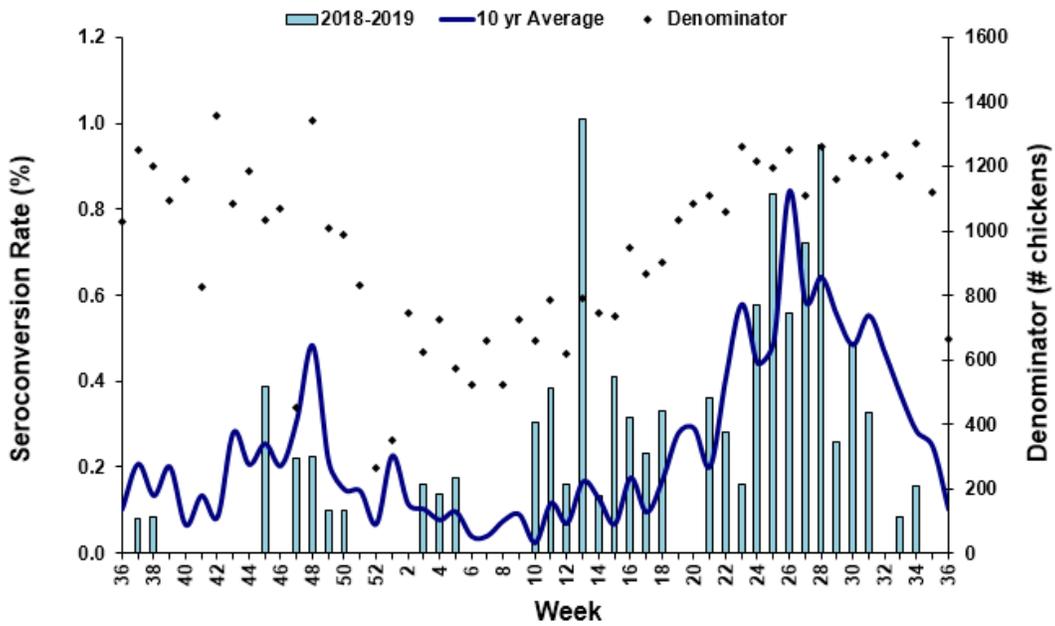
Thirty-two sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Lee, Nassau, Orange, Pasco, Pinellas, Putnam, Sarasota, Seminole, St. Johns, St. Lucie, Volusia, and Walton counties. One sentinel chicken tested positive for antibodies to HJV (Highlands J virus) this week in Leon County.

County	Collection Date	Seroconversion Rates (%)						County Totals	
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Brevard	8/21/19-8/23/19	9.62		9.62				5 WNV	26 WNV, 1 EEEV
Citrus	8/27/19	2.70		2.70				2 WNV	12 WNV, 4 EEEV
Hillsborough	8/27/19	1.85		1.85				1 WNV	2 WNV
Indian River	8/22/19-8/23/19	7.89		7.89				3 WNV	22 WNV
Lee	8/27/19	8.33		8.33				1 WNV	11 WNV
Leon	8/19/19				2.38		2.38	1 HJV	4 EEEV, 1 HJV
Nassau	8/24/19	9.38		9.38				3 WNV	7 WNV, 7 EEEV
Orange	8/19/19-8/22/19	9.90		9.90				10 WNV	32 WNV, 6 EEEV
	8/26/19	3.13		3.13				3 WNV	
Pasco	8/28/19	1.89		1.89				1 WNV	1 WNV
Pinellas	8/26/19	1.79		1.79				1 WNV	1 WNV
Putnam	8/16/19	6.06		6.06				2 WNV	9 WNV, 3 EEEV
	8/23/19	7.14		7.14				1 WNV	
Sarasota	8/23/19	3.70		3.70				2 WNV	6 WNV
Seminole	8/26/19	2.70		2.70				1 WNV	9 WNV, 1 EEEV
St. Johns	8/26/19	2.04		2.04				1 WNV	19 WNV, 8 EEEV
St. Lucie	8/26/19	7.14		7.14				2 WNV	5 WNV
Volusia	8/26/19	5.71		5.71				2 WNV	27 WNV, 5 EEEV
Walton	8/26/19	0.73		0.73				1 WNV	3 WNV, 42 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

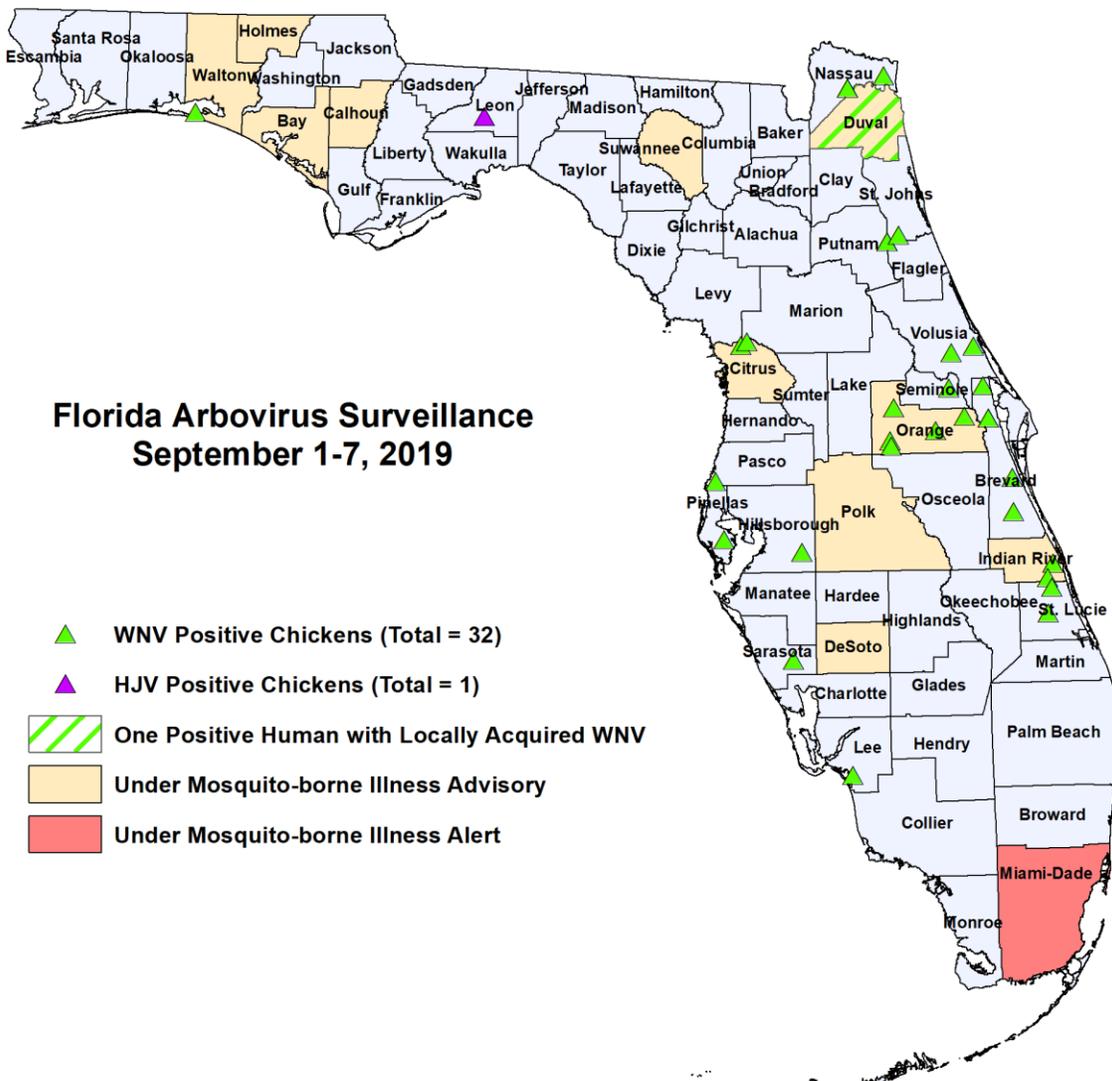
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, four reports representing a total of four dead birds, including one raptor, were received from four counties.

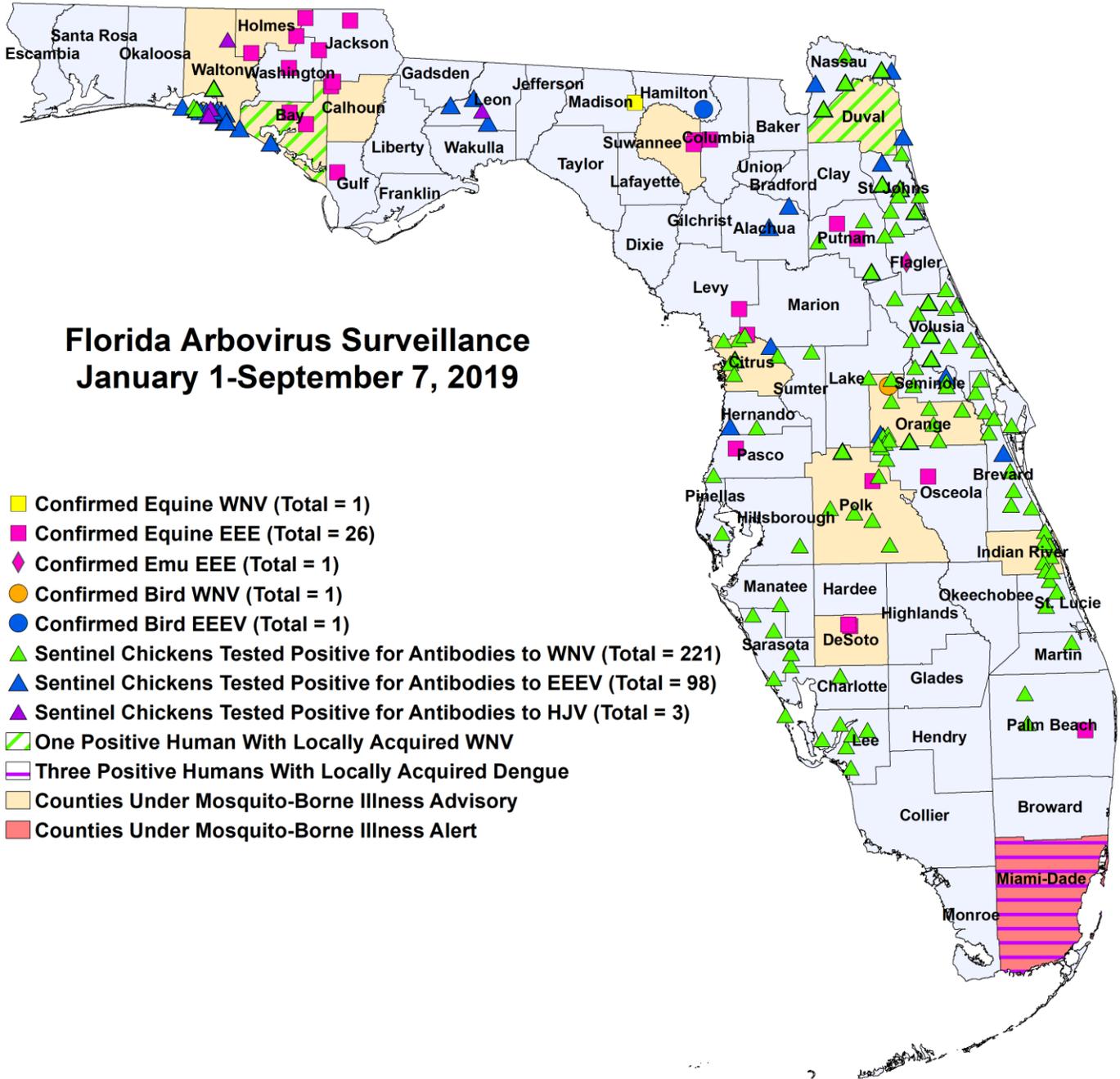
In 2019, 281 reports representing a total of 534 dead birds (14 crows, 11 jays, 74 raptors, and 34 doves) were received from 42 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

2019

County	Total Dead Birds	Crows	Jays	Raptors	Doves
Hillsborough	1	0	0	1	0
Lake	1	0	0	0	0
Miami-Dade	1	0	0	0	0
Volusia	1	0	0	0	0

Maps





Florida Arbovirus Surveillance January 1-September 7, 2019

- Confirmed Equine WNV (Total = 1)
- Confirmed Equine EEE (Total = 26)
- ◆ Confirmed Emu EEE (Total = 1)
- Confirmed Bird WNV (Total = 1)
- Confirmed Bird EEEV (Total = 1)
- ▲ Sentinel Chickens Tested Positive for Antibodies to WNV (Total = 221)
- ▲ Sentinel Chickens Tested Positive for Antibodies to EEEV (Total = 98)
- ▲ Sentinel Chickens Tested Positive for Antibodies to HJV (Total = 3)
- ▨ One Positive Human With Locally Acquired WNV
- ▨ Three 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	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: 26 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) EEEV: 1 sentinel (7/18)
Calhoun	EEEV: 3 horses (3/3, 3/22)
Charlotte	WNV: 3 sentinels (7/23, 8/5)
Columbia	EEEV: 1 horse (3/30)
Citrus	WNV: 12 sentinels (1/8, 1/29, 7/23, 8/6, 8/20, 8/27) EEEV: 1 horse (5/11), 4 sentinels (4/26, 6/18, 7/30)
Duval	WNV: 1 human (July)
DeSoto	EEEV: 2 horses (6/23, 7/2)

Flagler	EEEV: 1 emu (3/17)
Gulf	EEEV: 1 horse (2/27)
Hamilton	EEEV: 1 eagle (3/21)
Hernando	WNV: 1 sentinel (8/19) EEEV: 1 sentinel (3/4)
Hillsborough	WNV: 2 sentinels (8/20, 8/27)
Holmes	EEEV: 3 horses (6/1, 6/5, 6/20)
Indian River	WNV: 22 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)
Jackson	EEEV: 1 horse (6/19)
Lee	WNV: 11 sentinels (7/9, 8/5, 8/6, 8/12, 8/19, 8/20, 8/27)
Leon	EEEV: 4 sentinels (5/28, 6/10) HJV: 1 sentinel (8/19)
Levy	EEEV: 1 horse (6/19)
Madison	WNV: 1 horse (4/1) EEEV: 1 horse (4/1)
Manatee	WNV: 1 sentinel (2/5)
Martin	WNV: 1 sentinel (8/16)
Miami-Dade	Dengue: 3 humans (March, July (2))
Nassau	WNV: 7 sentinels (8/3, 8/17, 8/24) EEEV: 7 sentinels (6/21, 7/13, 7/27, 8/3)
Orange	WNV: 1 eagle (6/22), 32 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) EEEV: 6 sentinels (6/17, 7/11, 7/18, 7/25)
Osceola	EEEV: 1 horse (6/10)
Palm Beach	WNV: 6 sentinels (7/8, 7/22, 8/5, 8/19) EEEV: 1 horse (2/25)
Pasco	WNV: 1 sentinel (8/28) EEEV: 1 horse (6/20)
Pinellas	WNV: 1 sentinel (8/26)
Polk	WNV: 16 sentinels (7/8, 7/15, 7/22, 7/29, 8/5, 8/12, 8/16, 8/19) EEEV: 1 horse (4/24), 5 sentinels (5/21, 5/24, 5/31, 6/21, 6/28)
Putnam	WNV: 9 sentinels (6/24, 7/17, 7/24, 8/2, 8/7, 8/8, 8/16, 8/23) EEEV: 2 horses (4/28, 8/17), 3 sentinels (5/29, 6/12, 7/24)
Sarasota	WNV: 6 sentinels (2/15, 2/22, 7/29, 8/9, 8/19, 8/23)
Seminole	WNV: 9 sentinels (6/3, 7/15, 7/29, 8/20, 8/26) EEEV: 1 sentinel (4/8)
St. Johns	WNV: 19 sentinels (7/1, 7/19, 7/29, 8/5, 8/12, 8/19, 8/26) EEEV: 8 sentinels (4/8, 4/15, 6/3, 6/24, 7/8, 7/29, 8/12, 8/19)
St. Lucie	WNV: 5 sentinels (8/1, 8/8, 8/15, 8/26)
Sumter	WNV: 1 sentinel (1/8)
Suwannee	EEEV: 2 horses (6/4, 6/7)
Volusia	WNV: 27 sentinels (6/17, 6/24, 7/1, 7/15, 7/22, 7/29, 8/5, 8/12, 8/12, 8/19, 8/26) EEEV: 5 sentinels (1/14, 1/22, 1/28, 7/1, 7/15)
Walton	WNV: 3 sentinels (4/23, 8/5, 8/26) EEEV: 42 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) HJV: 3 sentinels (6/3, 7/9, 7/29)
Washington	EEEV: 2 horses (5/28, 6/19)

Acknowledgements and Data Sources

Contributors: Andrea Morrison, PhD, MSPH, Dana Giandomenico, MPH, and Danielle Stanek, DVM, DOH Bureau of Epidemiology; Lea Heberlein-Larson, Maribel Castaneda, and Valerie Mock, DOH Bureau of Public Health Laboratories; Carina Blackmore, DVM, PhD, DOH Division of Disease Control and Health Protection.

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.