



Florida Arbovirus Surveillance Week 49: December 2-8, 2018

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) and California encephalitis group viruses (CEV). Malaria, a parasitic mosquito-borne disease is also included. During the period of December 2-8, the following arboviral activity was recorded in Florida.

WNV activity: Two human cases of WNV infection were reported this week in Duval and Escambia counties. No horses with WNV infection were reported this week. One mosquito pool tested positive for WNV this week in Hillsborough County. Thirty sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Lee, Leon, Manatee, Nassau, Orange, Sarasota, St. Johns, Sumter, Volusia, and Walton counties. In 2018, positive samples from 31 humans, three blood donors, thirteen horses, one zebra, one red-shouldered hawk, five crows, 30 mosquito pools, and 775 sentinel chickens have been reported from 40 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 2018, a positive sample from one sentinel chicken has been reported from one county.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection was reported this week. One sentinel chicken tested positive for antibodies to EEEV this week in Nassau County. In 2018, positive samples from three humans, 52 horses, one mule, one donkey, one owl, two emus, five emu flocks, three mosquito pools, and 148 sentinel chickens have been reported from 33 counties.

International Travel-Associated Dengue Fever Cases: Six cases of dengue fever were reported this week in persons that had international travel. In 2018, 53 travel-associated cases have been reported.

Dengue Fever Cases Acquired in Florida: No cases of locally acquired dengue fever were report this week. In 2018, one case of locally acquired dengue fever has been reported.

International Travel-Associated Chikungunya Fever Cases: No cases of chikungunya fever were reported this week in persons that had international travel. In 2018, four travel-associated cases have been reported.

Chikungunya Fever Cases Acquired in Florida: No cases of locally acquired chikungunya fever were reported this week. In 2018, 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 2018, 91 cases have been reported.

Zika Fever Cases Acquired in Florida: No cases of locally acquired Zika fever were reported this week. In 2018, no cases of locally acquired Zika fever have been reported.

Advisories/Alerts: Charlotte, Clay, Columbia, Gadsden, Lake, Manatee, Marion, Martin, Miami-Dade, Okeechobee, Orange, Putnam, Sarasota, St. Johns, Suwannee, Taylor, Volusia, Walton, and Washington counties are currently under a mosquito-borne illness advisory. Bay, Duval, Leon, Levy, and Nassau counties are 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 <https://www.cdc.gov/zika/intheus/florida-update.html>. For additional information on Zika virus cases from 2016 or 2017, including up-to-date numbers, please visit <https://zikafreefl.org/>.

There is a Level 2 (Alert) Travel Health Notice from the CDC for multiple countries in Africa, the Caribbean, Central and South America, Southeast Asia, and Pacific Islands related to Zika virus transmission and an association with poor pregnancy outcomes. Pregnant women should consider postponing travel to these areas. There is also a Level 2 Travel Health Notice for Brazil and a Level 1 Travel Health Notice in Nigeria related to the transmission of yellow fever virus. Additional information on travel health notices can be found at the following link: <http://wwwnc.cdc.gov/travel/notices>. For a map of arboviral disease activity in the United States, please visit the following link: https://wwwn.cdc.gov/arbovet/maps/ADB_Diseases_Map/index.html.

2018 Human Case Summary*

West Nile Virus Illnesses Acquired in Florida: A total of 31 human cases of WNV illness acquired in Florida have been reported in 2018; four in Bay (July, September), one in Charlotte (August), two in Clay (September, October), 11 in Duval (August, September, October), one in Escambia (November), four in Leon (October), one in Manatee (July), three in Nassau (August, October), one in Putnam (October), one in Suwannee (August), one in Taylor (October), and one in Washington (October) counties. Three asymptomatic positive blood donors were reported from Bay (June), Duval (August), and Gadsden (October) counties.

EEEV Infection Acquired in Florida: Three human cases of Eastern equine encephalitis acquired in Florida have been reported in 2018 in Columbia (July), Taylor (May), and Volusia (July) counties.

International Travel-Associated Chikungunya Fever Cases: Four cases of chikungunya fever with onset in 2018 have been reported in individuals with travel history to a chikungunya endemic country in the two weeks prior to onset. Country of origin was: Brazil (2), India, and Kenya. Counties reporting the case were: Miami-Dade, Orange, Palm Beach, and Seminole.

International Travel-Associated Dengue Fever Cases: Fifty-three cases of dengue fever with onset in 2018 have been reported in individuals with travel history to a dengue endemic country in the two weeks prior to onset. Countries of origin were: Bangladesh, Cuba (34), Haiti (10), India, Jamaica, Mexico, Nigeria, Philippines, Thailand, and Venezuela (2). Counties reporting cases were: Broward (8), Charlotte, Citrus, Duval, Hillsborough (6), Lake, Lee (3), Miami-Dade (25), Monroe (2), Orange (2), and Palm Beach (3). Three 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 2018, 45 cases of dengue reported in Florida have been serotyped by PCR. Additional serotyping and strain typing are being conducted.

	# of cases per serotype – 2018
DENV-1	12
DENV-2	31
DENV-3	2
Total	45

Dengue Fever Cases Acquired in Florida: In 2018, one case of locally acquired dengue fever has been reported in Miami-Dade County, with onset in October.

International Travel-Associated Zika Fever Cases: In 2018, 91 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 (3), Brazil/Haiti, Brazil/Mexico, Colombia, Cuba (21), Cuba/Mexico, Dominica, Dominican Republic (2), Guatemala (2), Guatemala/Mexico, Haiti (33), Honduras (7), Jamaica (2), Puerto Rico, Turks and Caicos, and Venezuela (13). Counties reporting cases were: Broward (6), Collier (35), Hernando, Hillsborough, Lee, Miami-Dade (25), Orange (11), Osceola (3), Palm Beach (6), Pinellas, and Walton. Eighteen cases were reported in non-Florida residents. Florida is monitoring a total of 69 pregnant women in 2018.

In addition, two individuals tested in 2018 reported travel in 2016 to both Miami-Dade County and countries with areas of active Zika virus transmission. Exposure location in 2016 could not definitively be determined.

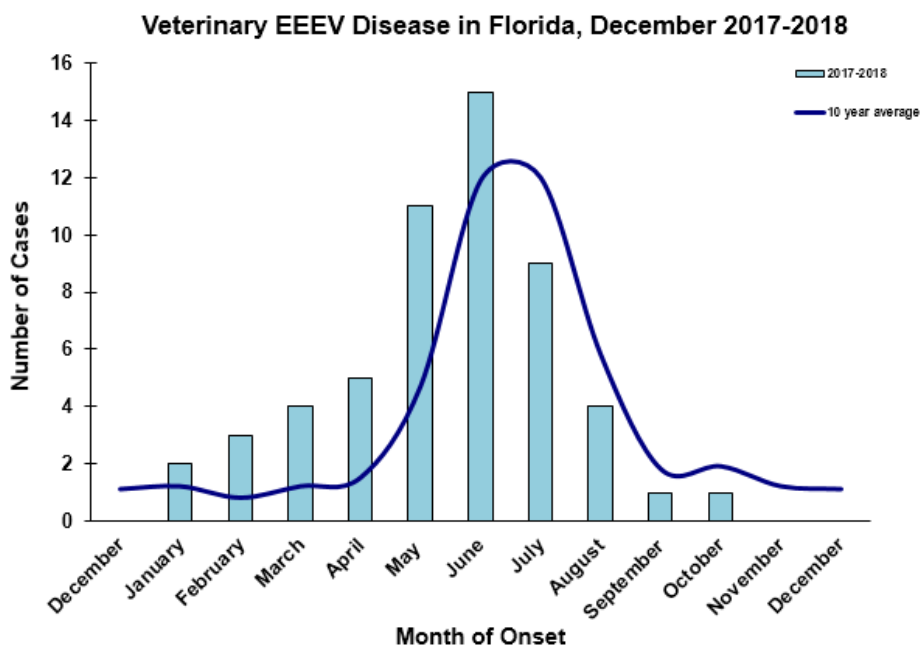
International Travel-Associated Malaria Cases: Sixty-one cases of malaria with onset in 2018 have been reported. Countries of origin were: Afghanistan (2), Angola, Benin (2), Brazil, Cameroon, Dominican Republic, Ethiopia, Gabon, Ghana (5), Haiti (2), India (5), Kenya, Liberia (2), Mali/Togo, Nicaragua (4), Nigeria (21), Peru, Sierra Leone, South Africa, Sudan, Tanzania, Togo (3), and Venezuela (2). Counties reporting cases were: Broward (16), Clay, Duval (5), Escambia, Gadsden, Hillsborough (5), Miami-Dade (15), Okaloosa, Orange (4), Osceola, Palm Beach (3), Pasco, Pinellas (2), Polk, Sarasota, and Seminole (3). Ten cases were reported in non-Florida residents.

Thirty-nine cases (64%) were diagnosed with *Plasmodium falciparum*. Sixteen cases (26%) were diagnosed with *Plasmodium vivax*. Four cases (7%) were diagnosed with *Plasmodium ovale*. Two cases (3%) were diagnosed with *Plasmodium malariae*.

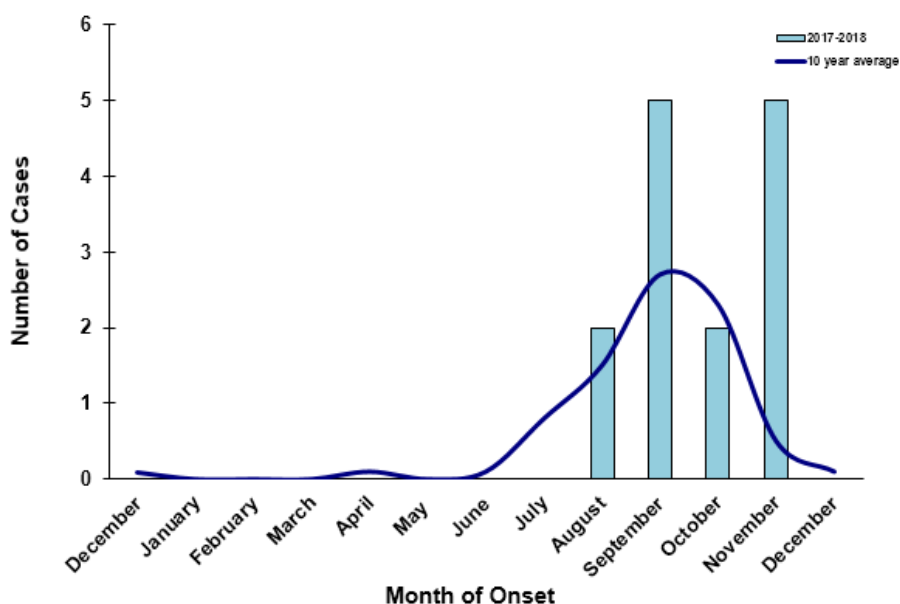
Veterinary Cases*

*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 2017-2018



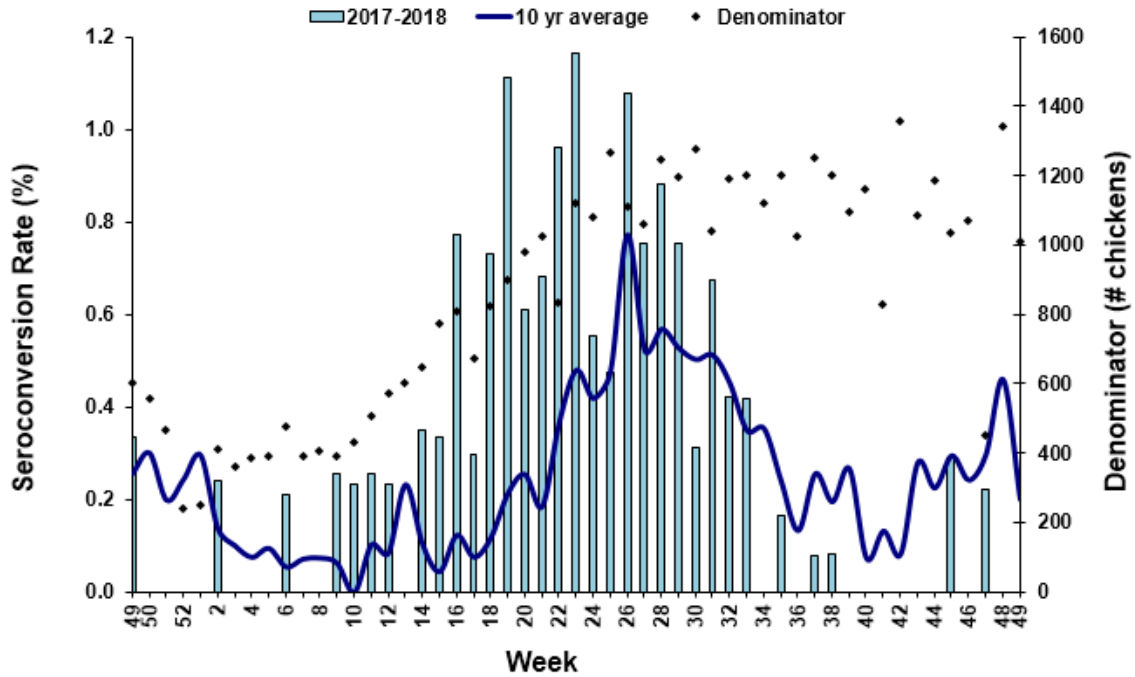
Sentinel Chickens*

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.

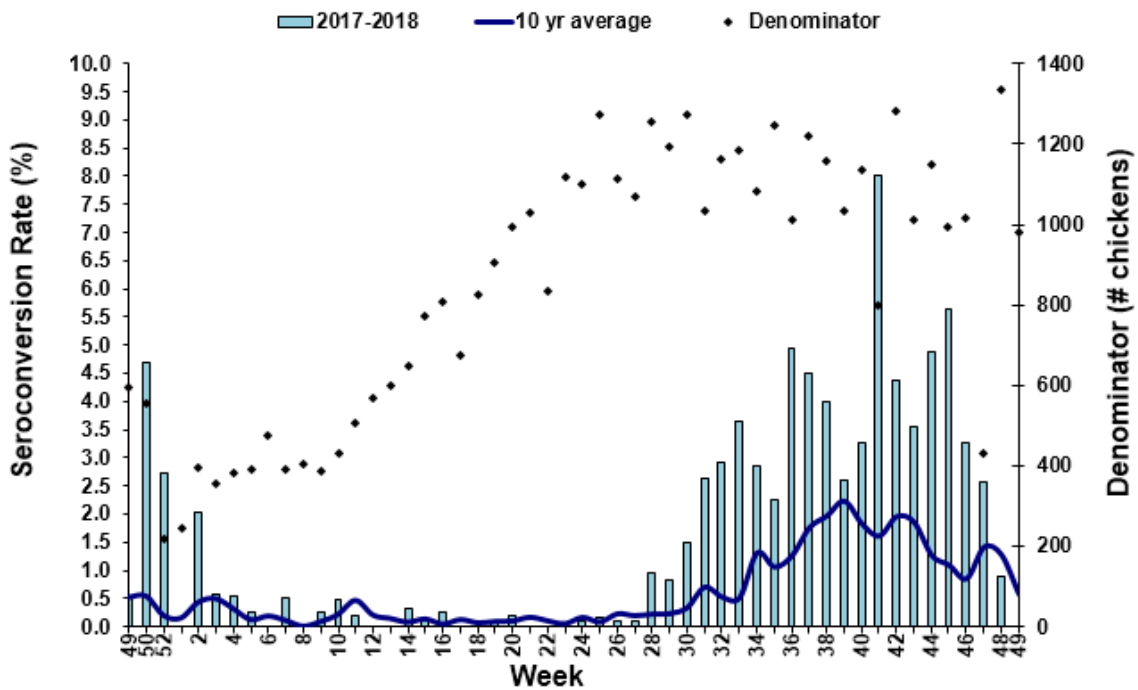
Thirty sentinel chickens tested positive for antibodies to WNV this week in Brevard, Citrus, Hillsborough, Indian River, Lee, Leon, Manatee, Nassau, Orange, Sarasota, St. Johns, Sumter, Volusia, and Walton counties. One sentinel chicken tested positive for antibodies to EEEV this week in Nassau County.

County	Collection Date	Seroconversion Rates (%)						County Totals	
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Brevard	11/14/18	1.92		1.92				1 WNV	25 WNV
Citrus	11/27/18	3.03		3.03				2 WNV	31 WNV, 11 EEEV
Hillsborough	10/30/18	3.70		3.70				2 WNV	18 WNV
Indian River	10/26/18	10.26		10.26				4 WNV	29 WNV
	11/21/18	2.63		2.63				1 WNV	
Lee	10/30/18	6.56		6.56				4 WNV	14 WNV
Leon	11/27/18	3.13		3.13				1 WNV	70 WNV, 13 EEEV, 1 HJV
Manatee	11/28/18	2.04		2.04				1 WNV	28 WNV, 1 EEEV
Nassau	11/17/18	3.13		3.13				1 WNV	90 WNV, 11 EEEV, 1 HJV
	11/24/18	12.50		12.50	3.13	3.13		4 WNV, 1 EEEV	
Orange	10/29/18	4.67		4.67				5 WNV	30 WNV, 13 EEEV
	11/26/18	1.98		1.98				2 WNV	
Sarasota	11/19/18	2.17		2.17				1 WNV	66 WNV
St. Johns	11/19/18	2.04		2.04				1 WNV	41 WNV, 36 EEEV, 1 HJV
	11/26/18	2.04		2.04				1 WNV	
Sumter	11/27/18	1.41		1.41				1 WNV	9 WNV, 1 EEEV
Volusia	11/20/18	2.22		2.22				1 WNV	13 WNV
	11/26/18	4.44		4.44				1 WNV	
Walton	10/30/18	5.69		5.69				7 WNV	115 WNV, 29 EEEV, 1 HJV
	11/26/18	2.47		2.47				2 WNV	

Sentinel Seroconversions to EEEV in Florida, 2017-2018



Sentinel Seroconversions to WNV in Florida, 2017-2018



*Please note that a change in testing procedure starting on week 50 of 2017 resulted in an artificial spike in positive test results that cannot be directly compared with past results.

Mosquito Pools

One mosquito pool tested positive for WNV this week in Hillsborough County.

County	Collection Date	Result	Species	County YTD
Hillsborough	11/20/18	WNV	<i>Culex nigripalpus</i>	1 WNV

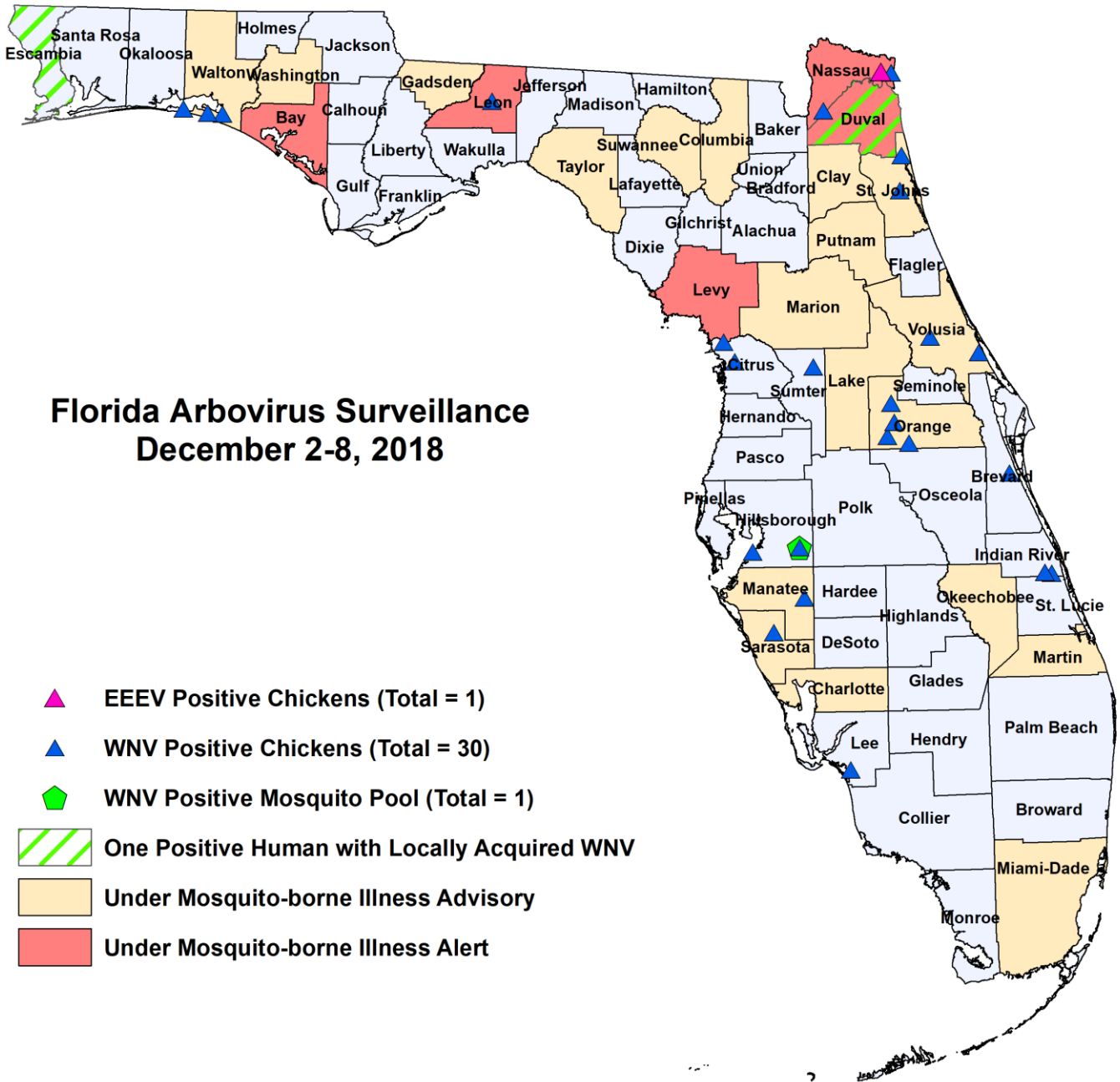
Dead Birds

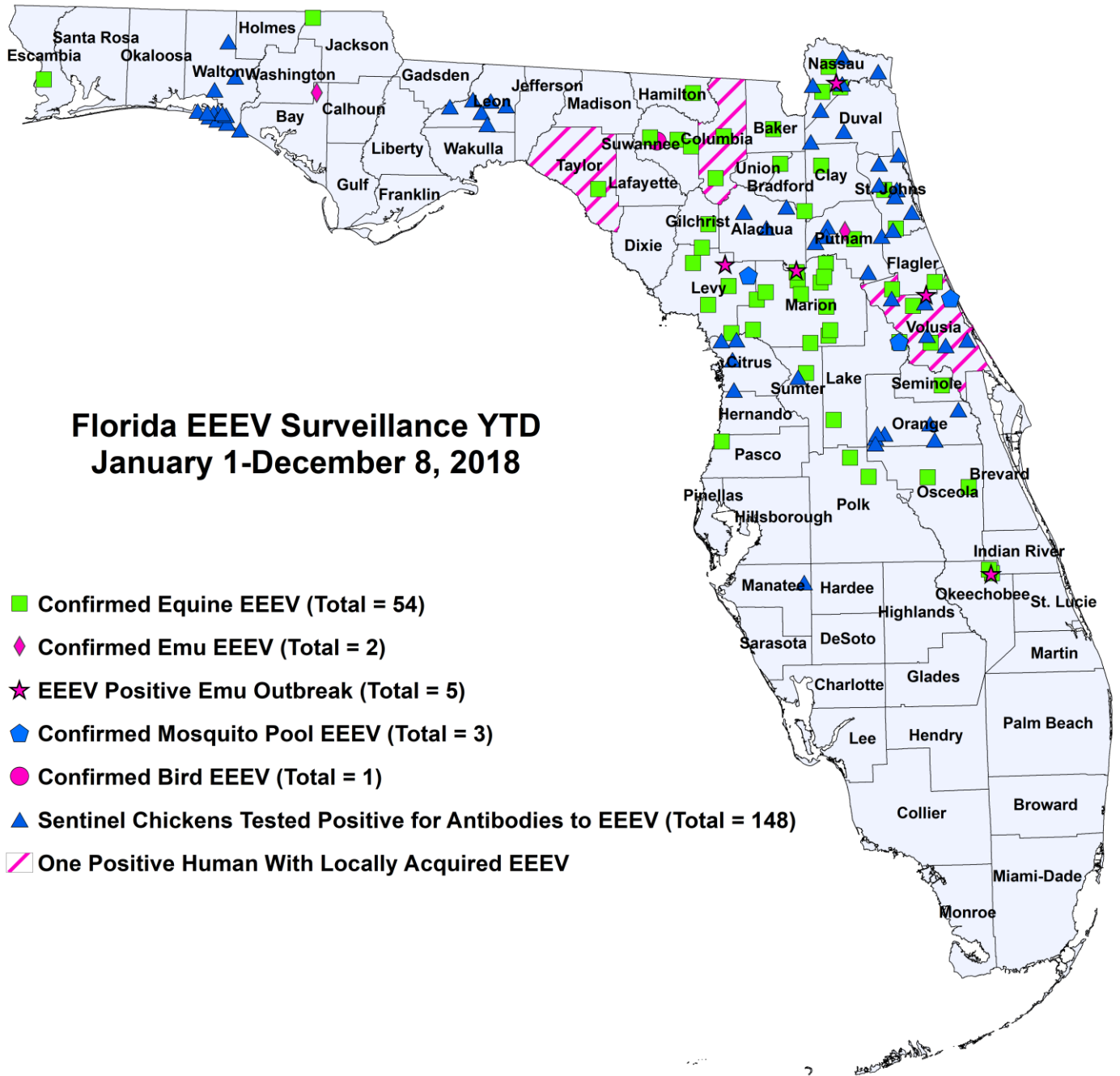
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, ten reports representing a total of 28 dead birds were received from eight counties.

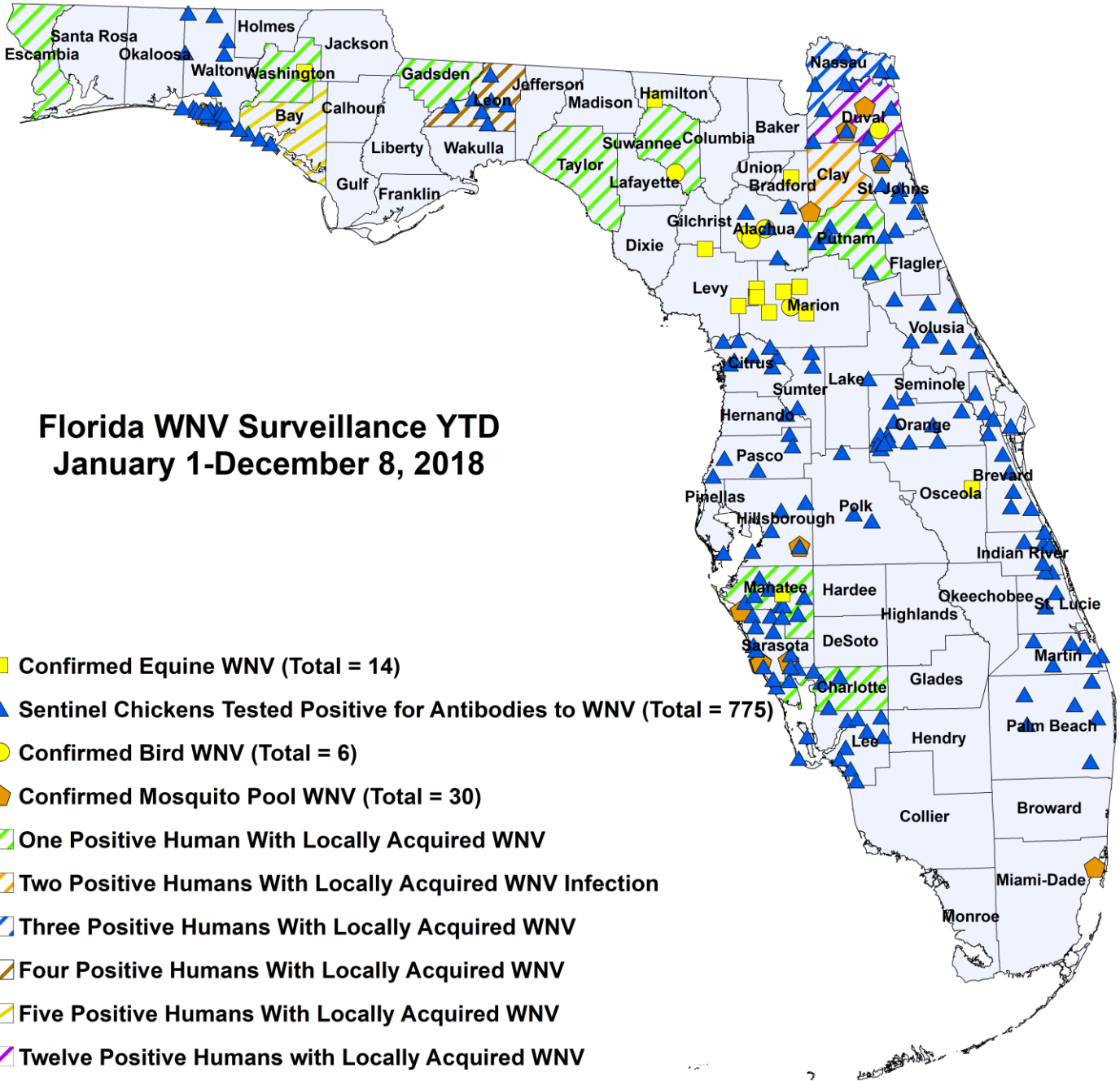
In 2018, 447 reports representing a total of 1217 dead birds (35 crows, 25 jays, 83 raptors, 38 doves) were received from 50 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

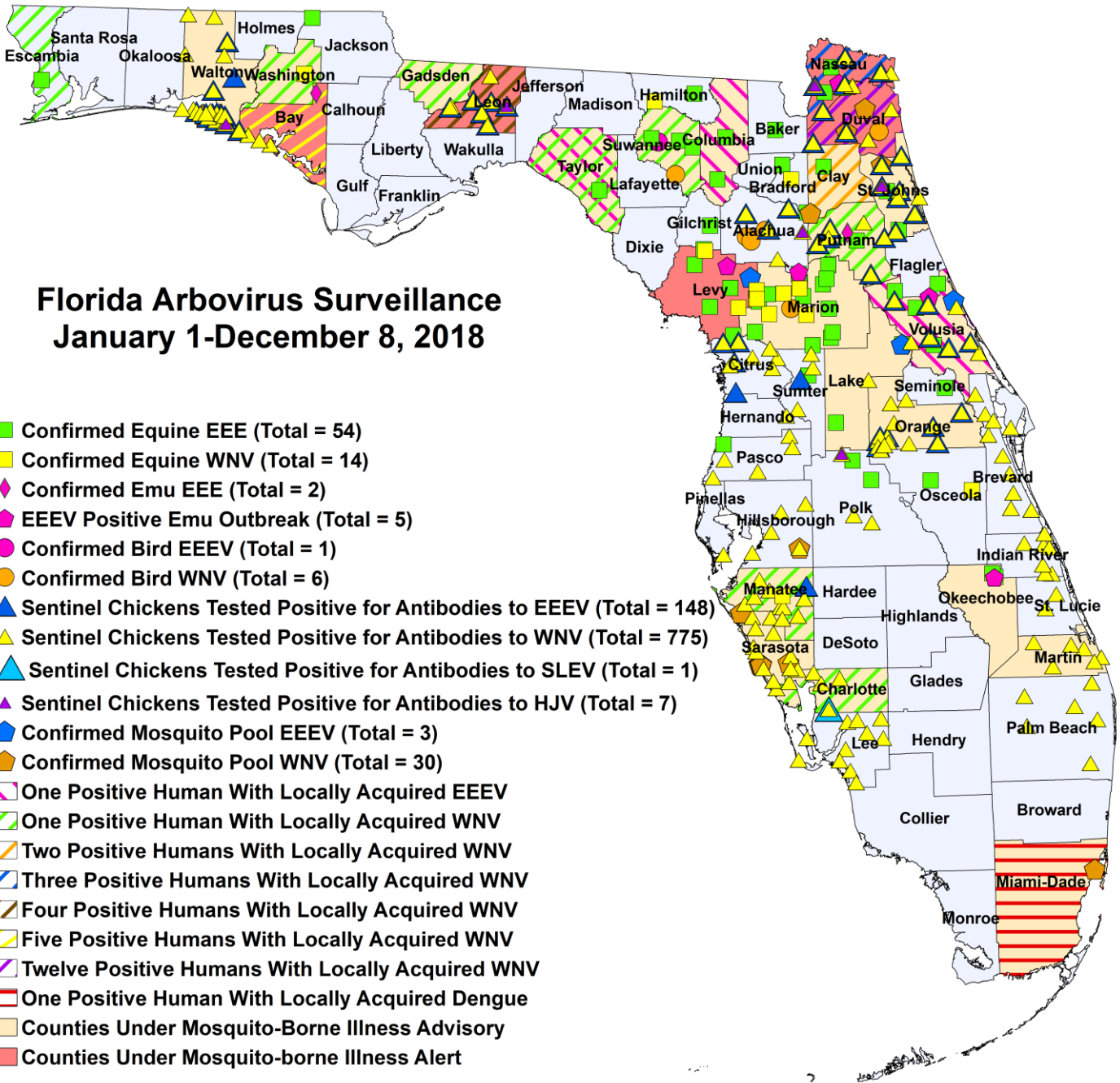
2018

County	Total Dead Birds	Crows	Jays	Raptors	Doves
Collier	3	0	0	0	0
Duval	4	0	0	0	0
Hillsborough	1	0	0	0	0
Lee	1	0	0	0	0
Martin	15	0	0	0	0
Miami-Dade	1	0	0	0	0
Orange	2	0	0	0	0
Sumter	1	0	0	0	0









2018 Arbovirus Activity by County	
County	Arbovirus Activity
Alachua	WNV: 3 crows (7/1, 9/12, 10/31), 25 sentinels (7/10, 7/18, 7/31, 8/7, 8/14, 9/4, 9/11, 9/18, 9/25, 10/9, 10/16, 10/30, 11/6, 11/9) EEEV: 8 sentinels (5/15, 5/22, 6/5, 6/19, 6/26, 8/7) HJV: 1 sentinel (8/28)
Baker	EEEV: 1 horse (3/11)
Bay	WNV: 1 asymptomatic blood donor (June), 4 humans (July, September), 19 sentinels (7/9, 7/16, 7/30, 8/6, 8/13, 8/20, 9/24, 10/1, 11/5) EEEV: 1 emu (11/1)
Bradford	WNV 1 horse (9/10) EEEV: 1 horse (6/8)

Brevard	WNV: 25 sentinels (8/24, 9/10, 9/12, 9/19, 9/26, 10/10, 10/11, 10/17, 10/18, 10/25, 10/26, 11/6, 11/7, 11/14)
Charlotte	WNV: 1 human (August), 18 sentinels (7/27, 8/10, 9/10, 9/14, 10/12, 10/26, 11/9, 11/15) SLEV: 1 sentinel (9/10)
Citrus	WNV: 31 sentinels (4/17, 9/4, 9/11, 10/9, 10/16, 10/23, 10/30, 11/6, 11/14, 11/27) EEEV: 11 sentinels (1/8, 4/30, 5/7, 7/9, 7/23, 8/7, 8/14, 9/10, 11/6)
Clay	WNV: 2 humans (September, October), 1 mosquito pool (7/17) EEEV: 1 horse (7/10)
Columbia	EEEV: 1 human (July), 2 horses (3/5, 5/30)
Duval	WNV: 1 asymptomatic blood donor (August), 11 humans (August, September, October), 2 mosquito pools (8/30, 9/26), 1 crow (10/15), 42 sentinels (7/30, 8/6, 8/13, 8/16, 8/27, 9/4, 9/10, 9/13, 9/17, 10/1, 10/8, 10/11, 10/15, 10/22) EEEV: 4 sentinels (6/11, 6/18, 6/25)
Escambia	WNV: 1 human (November) EEEV: 1 horse (10/1)
Flagler	EEEV: 1 horse (3/6)
Gadsden	WNV: 1 asymptomatic blood donor (October)
Gilchrist	WNV: 1 horse (9/24) EEEV: 2 horses (5/4, 6/11)
Hamilton	WNV: 1 horse (9/29) EEEV: 1 horse (4/3)
Hernando	WNV: 1 sentinel (10/22)
Hillsborough	WNV: 18 sentinels (1/10, 1/16, 2/13, 3/6, 3/13, 4/3, 5/15, 8/29, 9/25, 10/10, 10/16, 11/30, 11/7, 11/13), 1 mosquito pool (11/20)
Indian River	WNV: 29 sentinels (8/23, 9/6, 9/13, 9/14, 9/21, 9/28, 10/5, 10/11, 10/12, 10/15, 10/18, 10/25, 10/26, 11/1, 11/2, 11/8, 11/21)
Jackson	EEEV: 1 horse (7/2)
Lake	EEEV: 2 horses (5/24, 5/30), 1 mosquito pool (6/13)
Lee	WNV: 14 sentinels (9/3, 9/10, 9/17, 9/28, 10/2, 10/15, 10/22, 10/29, 10/30)
Leon	WNV: 4 humans (October), 70 sentinels (7/31, 8/1, 8/13, 8/20, 8/27, 9/4, 9/10, 9/17, 9/24, 10/1, 10/8, 10/16, 10/23, 10/29, 11/2, 11/5, 11/9, 11/15, 11/16, 11/27) EEEV: 13 sentinels (6/5, 6/25, 7/9, 7/31, 8/8, 8/13, 8/27, 11/5) HJV: 1 sentinel (7/19)
Levy	WNV: 3 horses (8/10, 9/20, 11/12), 1 zebra (9/23) EEEV: 3 horses (2/24, 3/5, 5/18), 1 mule (4/17), emu flock outbreak (3/2 for first emu), 1 mosquito pool (5/10)
Manatee	WNV: 1 human (July), 1 horse (11/7), 28 sentinels (1/9, 2/13, 8/7, 8/14, 8/21, 8/27, 9/4, 9/11, 9/18, 9/25, 10/1, 10/8, 10/16, 10/24, 11/5, 11/19, 11/28) EEEV: 1 sentinel (4/10)
Marion	WNV: 1 crow (9/12), 4 horses (10/26, 10/28, 11/4, 11/12) EEEV: 13 horses (2/28, 4/23, 5/3, 5/14, 6/1, 6/12, 6/19, 6/21, 7/20, 7/21, 7/24, 8/1, 8/29), 1 emu flock outbreak (5/2 for first emu)
Martin	WNV: 13 sentinels (8/17, 9/28, 10/5, 10/12, 11/2, 11/9)
Miami-Dade	WV: 1 mosquito pool (10/30) Dengue: 1 human (October)
Nassau	WNV: 3 humans (August, October), 90 sentinels (7/12, 7/14, 7/27, 7/28, 8/2, 8/3, 8/11, 8/18, 8/25, 9/1, 9/8, 9/15, 9/22, 9/29, 10/6, 10/13, 10/20, 10/27, 11/3, 11/10, 11/17, 11/24) EEEV: 4 horses (1/29, 4/30, 5/25, 6/2), 1 emu flock outbreak (7/5 for first emu), 11 sentinels (5/17, 5/25, 5/31, 6/8, 6/23, 6/28, 7/5, 7/12, 11/24) HJV: 1 sentinel (7/5)
Okeechobee	EEEV: 2 horses (6/11, 6/17), 1 emu flock outbreak (6/3 for first emu)
Orange	WNV: 30 sentinels (1/10, 9/6, 9/10, 9/13, 10/4, 10/11, 10/15, 10/18, 10/22, 10/29, 11/1, 11/5, 11/12, 11/15, 11/26) EEEV: 13 sentinels (2/27, 3/13, 6/5, 6/7, 6/12, 6/14, 6/21, 6/26, 7/17, 8/2)
Osceola	WNV: 1 horse (8/26) EEEV: 2 horses (7/2, 8/26)
Palm Beach	WNV: 21 sentinels (9/17, 10/1, 10/8, 10/15, 10/29, 11/5, 11/12, 11/16)

Pasco	WNV: 10 sentinels (10/10, 10/23, 10/31, 11/5, 11/19) EEEV: 1 horse (6/10)
Pinellas	WNV: 1 sentinel (10/22)
Polk	WNV: 8 sentinels (7/13, 9/14, 9/28, 10/1, 10/19) EEEV: 2 horses (2/27, 7/9) HJV: 2 sentinels (8/24)
Putnam	WNV: 1 human (October), 29 sentinels (8/23, 8/29, 9/13, 9/20, 10/4, 10/11, 11/8) EEEV: 1 horse (4/21), 1 emu (2/13), 11 sentinels (5/30, 7/13, 7/18, 8/15, 8/29, 9/13)
Sarasota	WNV: 18 mosquito pools (7/3, 7/10, 7/24, 7/26, 8/2, 8/9, 8/23, 8/30, 9/7), 66 sentinels (1/12, 2/2, 4/2, 4/9, 4/16, 5/11, 5/18, 7/20, 7/27, 7/30, 8/3, 8/6, 8/10, 8/13, 8/17, 8/20, 8/24, 8/27, 8/31, 9/4, 9/7, 9/10, 9/14, 9/17, 9/28, 10/5, 10/12, 10/15, 11/2, 11/9, 11/13, 11/19)
Seminole	WNV: 1 sentinel (11/13) EEEV: 1 horse (5/29)
St. Johns	WNV: 1 mosquito pool (10/16), 41 sentinels (8/13, 8/27, 9/4, 9/10, 9/17, 10/1, 10/8, 10/15, 10/22, 10/29, 11/5, 11/12, 11/19, 11/26) EEEV: 2 horses (1/9, 5/25), 36 sentinels (4/16, 4/23, 4/30, 5/7, 5/14, 5/21, 5/29, 6/4, 6/18, 6/25, 7/16, 7/23) HJV: 1 sentinel (8/27)
St. Lucie	WNV: 6 sentinels (9/6, 10/11, 10/18, 11/1)
Sumter	WNV: 9 sentinels (7/24, 8/28, 9/11, 9/18, 10/2, 10/9, 10/30, 11/27) EEEV: 1 horse (6/15), 1 sentinel (6/12)
Suwannee	WNV: 1 human (August), 1 red-shouldered hawk (10/5) EEEV: 1 owl (4/6), 3 horses (6/4, 6/22, 7/14)
Taylor	WNV: 1 human (October) EEEV: 1 human (May), 1 horse (5/31)
Union	EEEV: 1 horse (7/3)
Volusia	WNV: 13 sentinels (9/4, 9/17, 9/24, 10/1, 11/5, 11/12, 11/20, 11/26) EEEV: 1 human (July), 1 emu flock outbreak (5/9 for first emu), 1 donkey (6/21), 2 horses (6/16, 8/1), 1 mosquito pool (10/24), 10 sentinels (4/9, 4/16, 4/23, 4/30, 5/7, 5/21)
Walton	WNV: 6 mosquito pools (7/10, 7/19, 8/22), 115 sentinels (1/9, 1/22, 1/23, 2/26, 6/11, 6/18, 6/25, 7/2, 7/9, 7/16, 7/23, 7/30, 8/6, 8/13, 8/14, 8/20, 8/27, 8/28, 9/4, 9/10, 9/11, 9/17, 9/24, 9/25, 10/8, 10/16, 10/22, 10/29, 10/30, 11/5, 11/6, 11/26) EEEV: 29 sentinels (2/5, 3/5, 3/19, 4/2, 4/16, 4/30, 5/1, 6/11, 6/25, 7/2, 7/9, 7/10, 7/16, 7/23, 7/30, 7/31, 8/6, 8/9, 8/13) HJV: 1 sentinel (7/9)
Washington	WNV: 1 human (October), 1 horse (11/16)

Acknowledgements and Data Sources

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For more surveillance information, please see the DOH website at: <http://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: <http://www.cdc.gov/ncidod/dybid/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: <http://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.