



## Florida Arbovirus Surveillance Week 46: November 11-17, 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 November 11-17, 2018, the following arboviral activity was recorded in Florida.

**WNV activity:** No human cases of WNV infection were reported this week. One horse with WNV infection was reported this week in Marion County. Fifty-seven sentinel chickens tested positive for antibodies to WNV this week in Alachua, Bay, Brevard, Citrus, Hillsborough, Indian River, Leon, Manatee, Martin, Nassau, Orange, Palm Beach, Pasco, Sarasota, St. Johns, St. Lucie, Volusia, and Walton counties. In 2018, positive samples from 23 humans, three blood donors, ten horses, one zebra, one red-shouldered hawk, five crows, 29 mosquito pools, and 675 sentinel chickens have been reported from 37 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. Three sentinel chickens tested positive for antibodies to EEEV this week in Citrus and Leon counties. In 2018, positive samples from three humans, 52 horses, one mule, one donkey, one owl, two emus, five emu flocks, three mosquito pools, and 147 sentinel chickens have been reported from 33 counties.

**International Travel-Associated Dengue Fever Cases:** Two cases of dengue fever were reported this week in persons that had international travel. In 2018, 45 travel-associated cases have been reported.

**Dengue Fever Cases Acquired in Florida:** One case of locally acquired dengue fever was reported this week in Miami-Dade County. In 2018, one case of locally acquired dengue fever has been reported.

**International Travel-Associated Chikungunya Fever Cases:** One case of chikungunya fever was reported this week in a person 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, 88 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, Leon, Manatee, Marion, Martin, Miami-Dade, Okeechobee, Orange, Putnam, Sarasota, St. Johns, Suwannee, Taylor, Volusia, and Walton counties are currently under a mosquito-borne illness advisory. Bay, Duval, 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](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 23 human cases of WNV illness acquired in Florida have been reported in 2018; four in Bay (July, September), one in Charlotte (August), one in Clay (September), nine in Duval (August, September, October), one in Leon (October), one in Manatee (July), three in Nassau (August, October), one in Putnam (October), one in Suwannee (August), and one in Taylor (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:** Forty-five 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 (28), Haiti (9), Jamaica, Mexico, Nigeria, Philippines, Thailand, and Venezuela (2). Counties reporting cases were: Broward (8), Charlotte, Duval, Hillsborough (5), Lake, Lee (3), Miami-Dade (20), Monroe, Orange (2), and Palm Beach (3). Two 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, 39 cases of dengue reported in Florida have been serotyped by PCR. Additional serotyping and strain typing are being conducted.

	<b># of cases per serotype – 2018</b>
<b>DENV-1</b>	11
<b>DENV-2</b>	26
<b>DENV-3</b>	2
<b>Total</b>	<b>39</b>

**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, 88 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, Guatemala (2), Guatemala/Mexico, Haiti (32), Honduras (7), Jamaica (2), Puerto Rico, Turks and Caicos, and Venezuela (12). Counties reporting cases were: Broward (6), Collier (35), Hernando, Hillsborough, Lee, Miami-Dade (22), Orange (11), Osceola (3), Palm Beach (6), Pinellas, and Walton. Seventeen cases were reported in non-Florida residents. Florida is monitoring a total of 67 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.

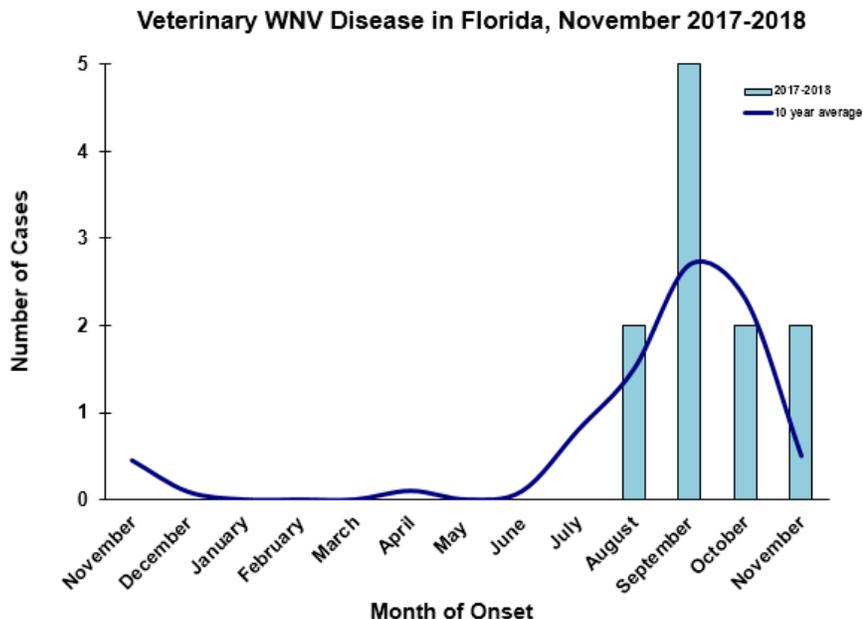
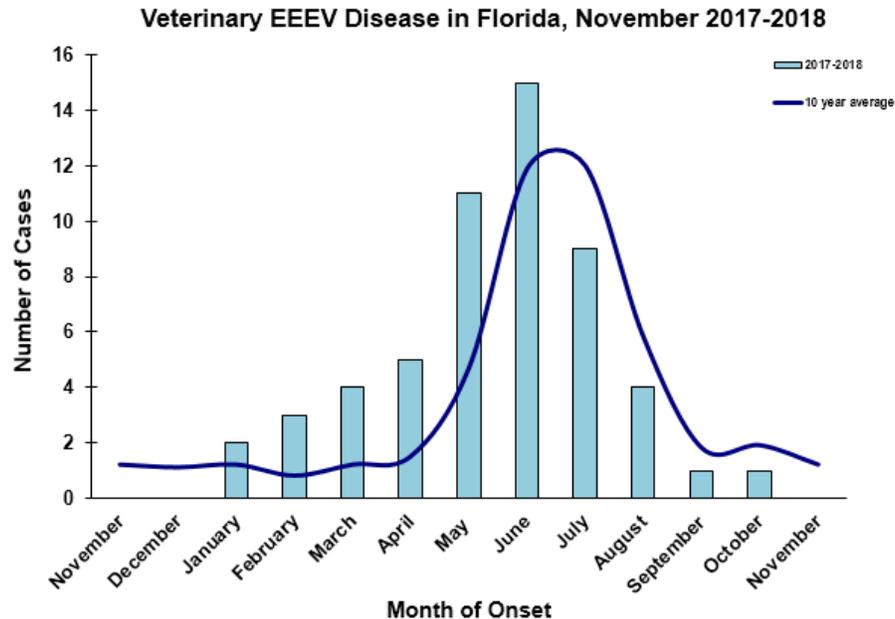
**International Travel-Associated Malaria Cases:** Fifty-seven cases of malaria with onset in 2018 have been reported. Countries of origin were: Afghanistan (2), Angola, Benin (2), Brazil, Cameroon, Dominican Republic, Ethiopia, Gabon, Ghana (4), Haiti (2), India (5), Kenya, Liberia (2), Mali/Togo, Nicaragua (4), Nigeria (19), Peru, Sierra Leone, South Africa, Tanzania, Togo (3), and Venezuela (2). Counties reporting cases were: Broward (15), Clay, Duval (4), Escambia, Gadsden, Hillsborough (5), Miami-Dade (15), Okaloosa, Orange (3), Osceola, Palm Beach (3), Pasco, Pinellas, Polk, Sarasota, and Seminole (3). Ten cases were reported in non-Florida residents.

Thirty-six cases (63%) were diagnosed with *Plasmodium falciparum*. Sixteen cases (28%) were diagnosed with *Plasmodium vivax*. Three cases (5%) were diagnosed with *Plasmodium ovale*. Two cases (4%) were diagnosed with *Plasmodium malariae*.

### Veterinary Cases\*

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

One horse with WNV infection was reported this week in Marion County



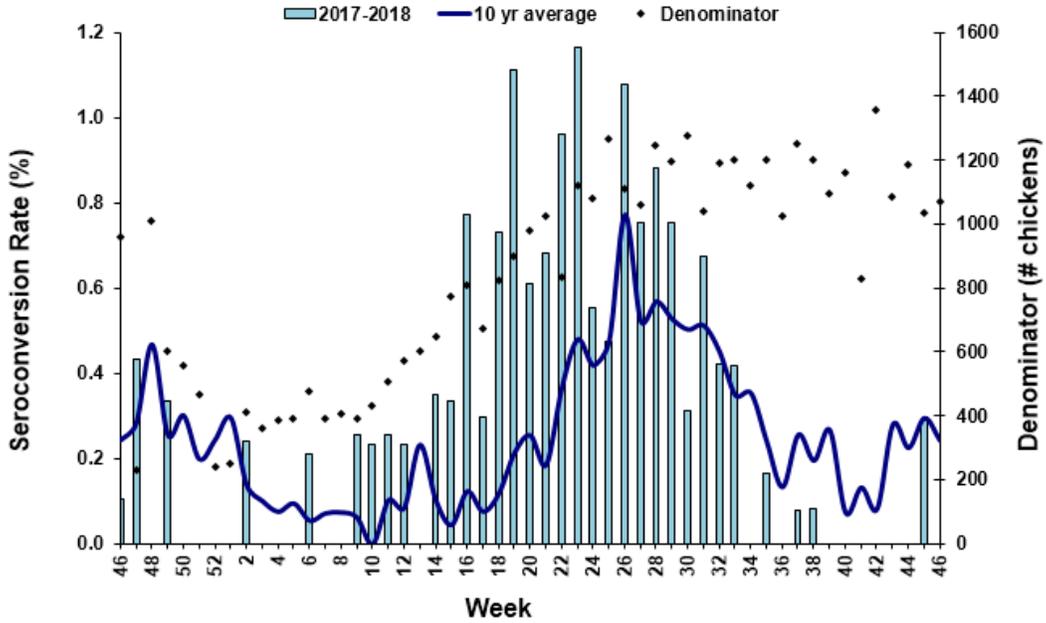
## Sentinel Chickens\*

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.

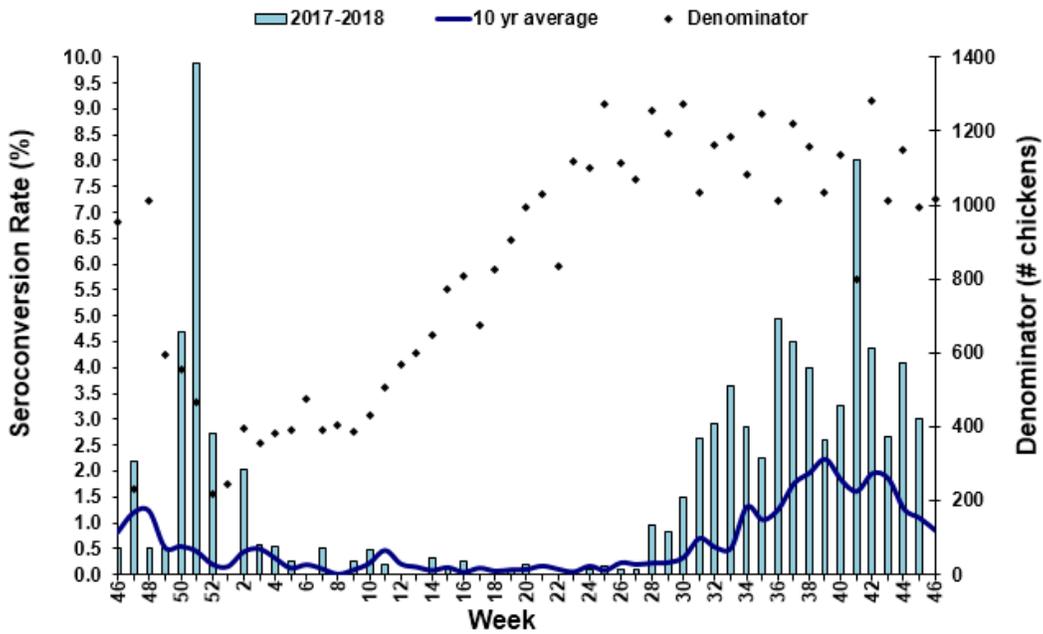
Fifty-seven sentinel chickens tested positive for antibodies to WNV this week in Alachua, Bay, Brevard, Citrus, Hillsborough, Indian River, Leon, Manatee, Martin, Nassau, Orange, Palm Beach, Pasco, Sarasota, St. Johns, St. Lucie, Volusia, and Walton counties. Three sentinel chickens tested positive for antibodies to EEEV this week in Citrus and Leon counties.

County	Collection Date	Seroconversion Rates (%)						County Totals	
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Alachua	11/6/18	7.14		7.14				1 WNV	23 WNV, 8 EEEV, 1 HJV
Bay	11/5/18	3.13		3.13				1 WNV	19 WNV
Brevard	10/31-11/1/18	6.56		6.56				4 WNV	19 WNV
Citrus	11/6/18	9.52		9.52	5.97	5.97		6 WNV, 2 EEEV	23 WNV, 11 EEEV
Hillsborough	11/7/18	1.79		1.79				1 WNV	14 WNV
Indian River	11/1-11/2/18	11.11		11.11				4 WNV	22 WNV
Leon	11/5/18	22.86		22.86	2.78	2.78		8 WNV, 1 EEEV	64 WNV, 13 EEEV, 1 HJV
Manatee	11/5/18	1.75		1.75				1 WNV	26 WNV, 1 EEEV
Martin	11/2/18	11.54		11.54				3 WNV	11 WNV
Nassau	11/3/18	10.71		10.71				3 WNV	81 WNV, 10 EEEV, 1 HJV
Orange	10/18/18	3.70		3.70				4 WNV	24 WNV, 13 EEEV
	11/1/18	2.80		2.80				3 WNV	
	11/5/18	1.96		1.96				2 WNV	
Palm Beach	11/5/18	18.18		18.18				2 WNV	13 WNV
Pasco	11/5/18	2.08		2.08				1 WNV	8 WNV
Sarasota	11/2/18	9.52		9.52				4 WNV	61 WNV
St. Johns	11/5/18	4.08		4.08				2 WNV	34 WNV, 36 EEEV, 1 HJV
St. Lucie	10/18/18	4.17		4.17				1 WNV	6 WNV
	11/1/18	4.55		4.55				1 WNV	
Volusia	11/5/18	8.51		8.51				4 WNV	8 WNV
Walton	10/22/18	0.96		0.96				1 WNV	111 WNV, 29 EEEV, 1 SLEV
	10/30/18	4.88		4.88				6 WNV	
	11/5/18	0.83		0.83				1 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

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

County	Collection Week	Result	Species	County YTD
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## Dead Birds

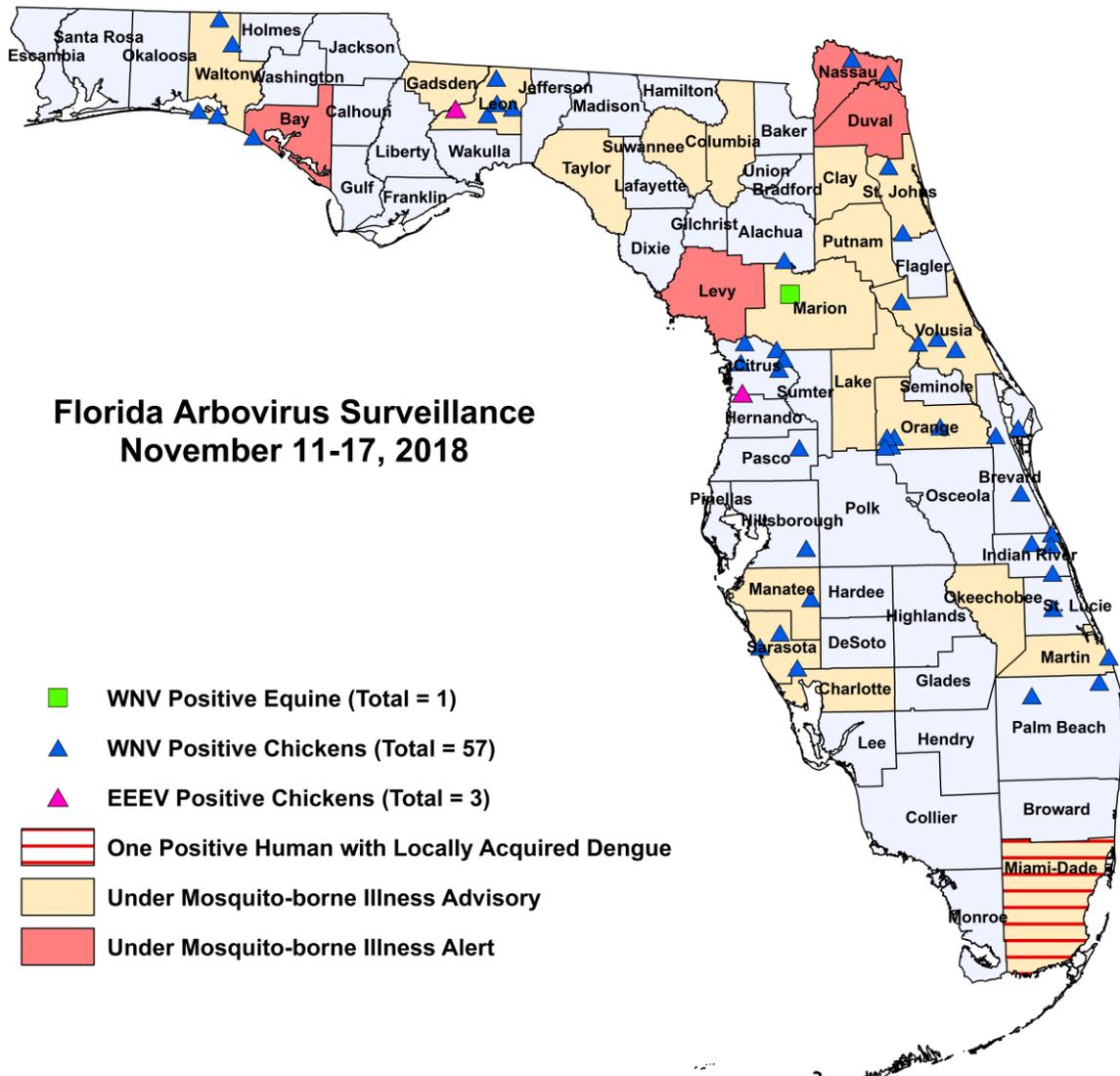
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, two reports representing a total of two dead birds were received from two counties.

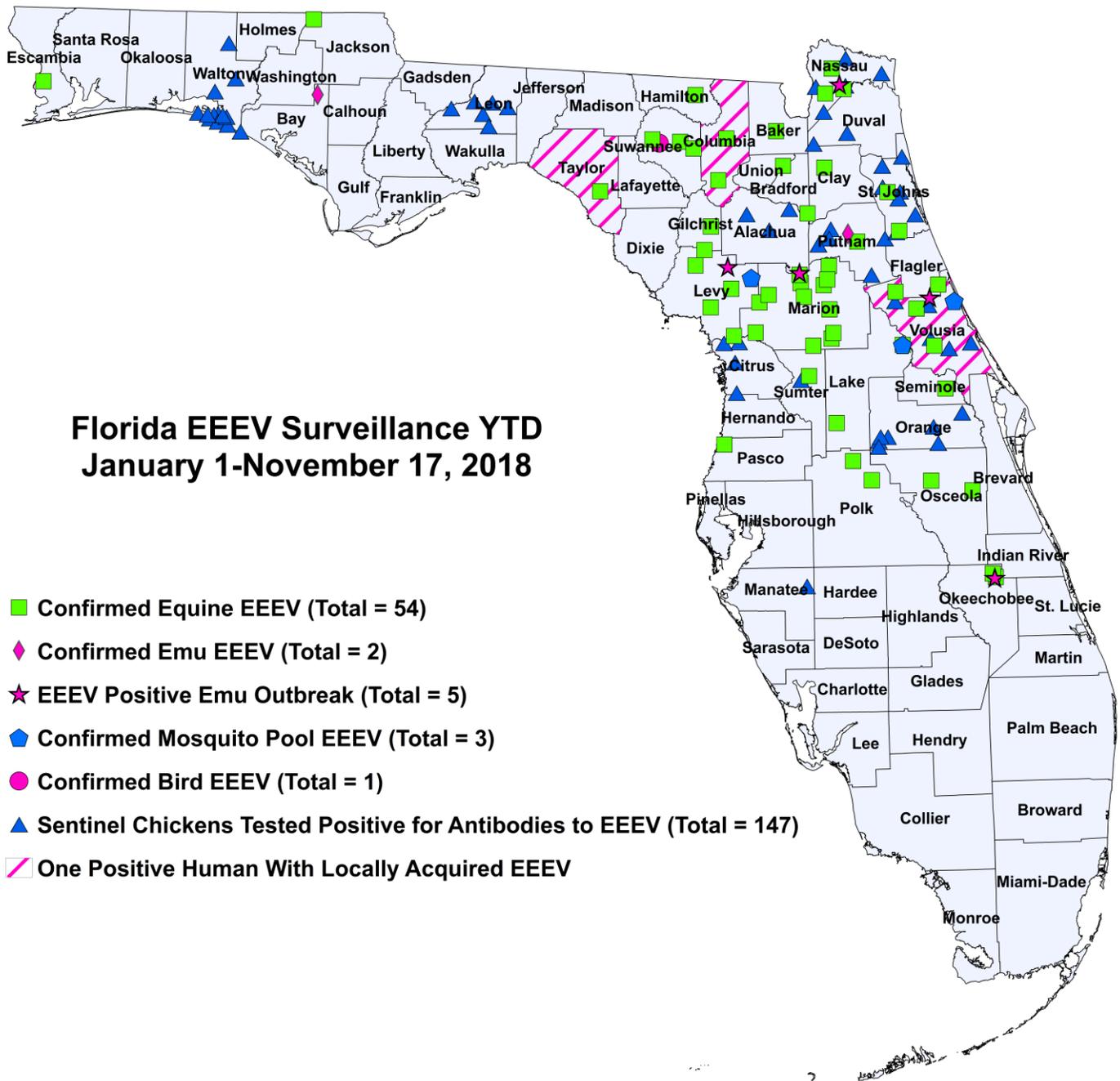
In 2018, 423 reports representing a total of 1150 dead birds (35 crows, 24 jays, 78 raptors, 37 doves) were received from 49 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to [www.myfwc.com/bird/](http://www.myfwc.com/bird/).

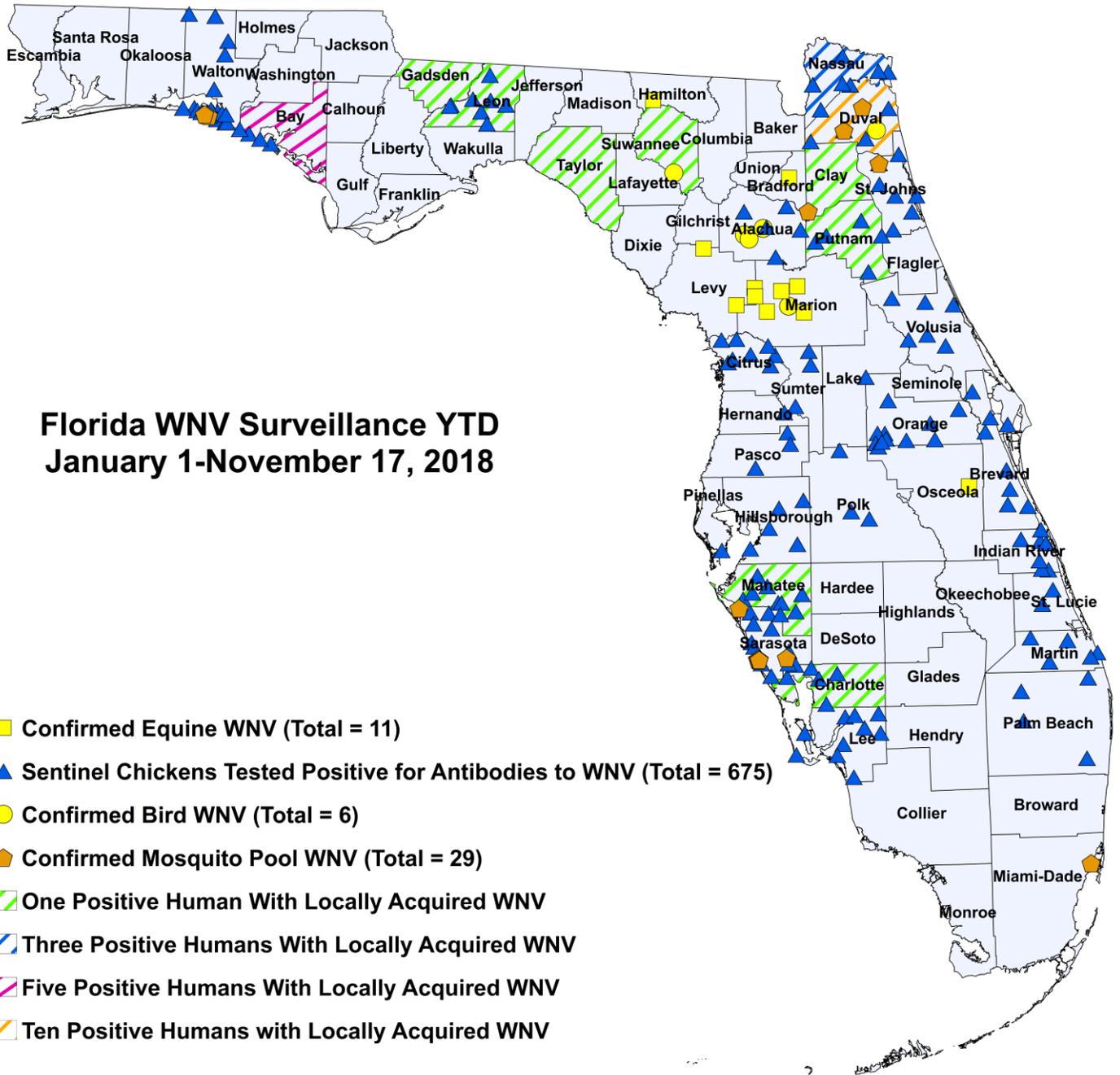
**2018**

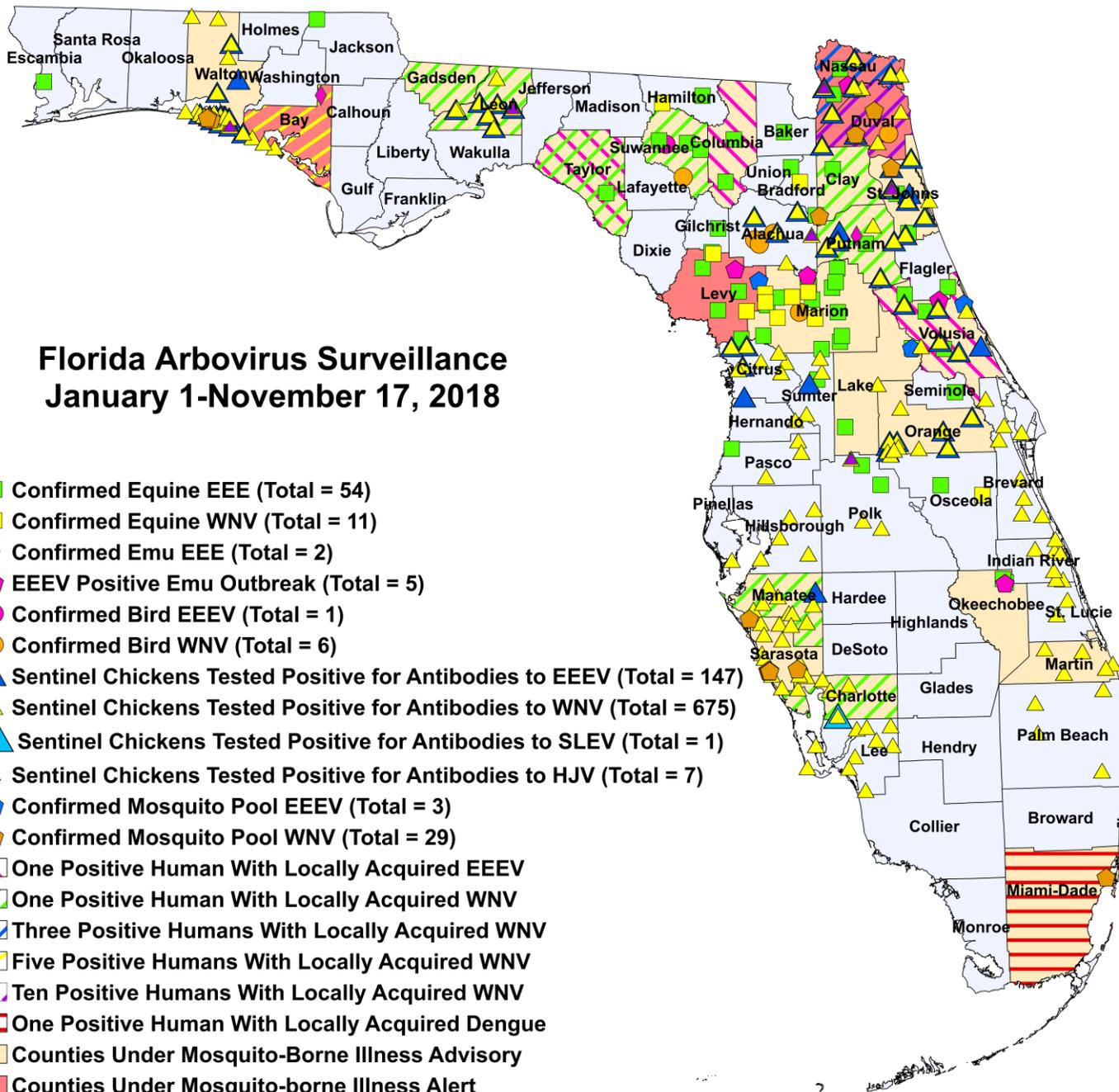
County	Total Dead Birds	Crows	Jays	Raptors	Doves
Gadsden	1	0	0	0	0
Seminole	1	0	0	0	0

## Maps









2018 Arbovirus Activity by County	
County	Arbovirus Activity
Alachua	WNV: 3 crows (7/1, 9/12, 10/31), 23 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) 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: 19 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)

<b>Charlotte</b>	WNV: 1 human (August), 15 sentinels (7/27, 8/10, 9/10, 9/14, 10/12, 10/26) SLEV: 1 sentinel (9/10)
<b>Citrus</b>	WNV: 23 sentinels (4/17, 9/4, 9/11, 10/9, 10/16, 10/23, 10/30, 11/6) EEEV: 11 sentinels (1/8, 4/30, 5/7, 7/9, 7/23, 8/7, 8/14, 9/10, 11/6)
<b>Clay</b>	WNV: 1 human (September), 1 mosquito pool (7/17) EEEV: 1 horse (7/10)
<b>Columbia</b>	EEEV: 1 human (July), 2 horses (3/5, 5/30)
<b>Duval</b>	WNV: 1 asymptomatic blood donor (August), 9 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)
<b>Escambia</b>	EEEV: 1 horse (10/1)
<b>Flagler</b>	EEEV: 1 horse (3/6)
<b>Gadsden</b>	WNV: 1 asymptomatic blood donor (October)
<b>Gilchrist</b>	WNV: 1 horse (9/24) EEEV: 2 horses (5/4, 6/11)
<b>Hamilton</b>	WNV: 1 horse (9/29) EEEV: 1 horse (4/3)
<b>Hernando</b>	WNV: 1 sentinel (10/22)
<b>Hillsborough</b>	WNV: 14 sentinels (1/10, 1/16, 2/13, 3/6, 3/13, 4/3, 5/15, 8/29, 9/25, 10/10, 10/16, 11/7)
<b>Indian River</b>	WNV: 22 sentinels (8/23, 9/6, 9/13, 9/14, 9/21, 9/28, 10/5, 10/11, 10/12, 10/15, 10/18, 10/26, 11/1, 11/2)
<b>Jackson</b>	EEEV: 1 horse (7/2)
<b>Lake</b>	EEEV: 2 horses (5/24, 5/30), 1 mosquito pool (6/13)
<b>Lee</b>	WNV: 13 sentinels (9/3, 9/10, 9/17, 9/28, 10/2, 10/15, 10/22, 10/29, 10/30)
<b>Leon</b>	WNV: 1 human (October), 64 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) EEEV: 13 sentinels (6/5, 6/25, 7/9, 7/31, 8/8, 8/13, 8/27, 11/5) HJV: 1 sentinel (7/19)
<b>Levy</b>	WNV: 2 horses (8/10, 9/20), 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)
<b>Manatee</b>	WNV: 1 human (July), 26 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) EEEV: 1 sentinel (4/10)
<b>Marion</b>	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)
<b>Martin</b>	WNV: 11 sentinels (8/17, 9/28, 10/5, 10/12, 11/2)
<b>Miami-Dade</b>	WV: 1 mosquito pool (10/30) Dengue: 1 human (October)
<b>Nassau</b>	WNV: 3 humans (August, October), 81 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, 11/3) EEEV: 4 horses (1/29, 4/30, 5/25, 6/2), 1 emu flock outbreak (7/5 for first emu), 10 sentinels (5/17, 5/25, 5/31, 6/8, 6/23, 6/28, 7/5, 7/12) HJV: 1 sentinel (7/5)
<b>Okeechobee</b>	EEEV: 2 horses (6/11, 6/17), 1 emu flock outbreak (6/3 for first emu)
<b>Orange</b>	WNV: 24 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) EEEV: 13 sentinels (2/27, 3/13, 6/5, 6/7, 6/12, 6/14, 6/21, 6/26, 7/17, 8/2)
<b>Osceola</b>	WNV: 1 horse (8/26) EEEV: 2 horses (7/2, 8/26)
<b>Palm Beach</b>	WNV: 13 sentinels (9/17, 10/1, 10/8, 10/15, 10/29, 11/5)
<b>Pasco</b>	WNV: 8 sentinels (10/10, 10/23, 10/31, 11/5) EEEV: 1 horse (6/10)
<b>Pinellas</b>	WNV: 1 sentinel (10/22)
<b>Polk</b>	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)

<b>Putnam</b>	WNV: 1 human (October), 19 sentinels (8/23, 8/29, 9/13, 9/20, 10/4, 10/11) EEEV: 1 horse (4/21), 1 emu (2/13), 11 sentinels (5/30, 7/13, 7/18, 8/15, 8/29, 9/13)
<b>Sarasota</b>	WNV: 18 mosquito pools (7/3, 7/10, 7/24, 7/26, 8/2, 8/9, 8/23, 8/30, 9/7), 61 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)
<b>Seminole</b>	EEEV: 1 horse (5/29)
<b>St. Johns</b>	WNV: 1 mosquito pool (10/16), 34 sentinels (8/13, 8/27, 9/4, 9/10, 9/17, 10/1, 10/8, 10/15, 10/22, 10/29, 11/5) 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)
<b>St. Lucie</b>	WNV: 6 sentinels (9/6, 10/11, 10/18, 11/1)
<b>Sumter</b>	WNV: 8 sentinels (7/24, 8/28, 9/11, 9/18, 10/2, 10/9, 10/30) EEEV: 1 horse (6/15), 1 sentinel (6/12)
<b>Suwannee</b>	WNV: 1 human (August), 1 red-shouldered hawk (10/5) EEEV: 1 owl (4/6), 3 horses (6/4, 6/22, 7/14)
<b>Taylor</b>	WNV: 1 human (October) EEEV: 1 human (May), 1 horse (5/31)
<b>Union</b>	EEEV: 1 horse (7/3)
<b>Volusia</b>	WNV: 8 sentinels (9/4, 9/17, 9/24, 10/1, 11/5) 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)
<b>Walton</b>	WNV: 6 mosquito pools (7/10, 7/19, 8/22), 111 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) 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)

### 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/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: <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.