



## Florida Arbovirus Surveillance Week 51: December 15-21, 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 15-21, 2019, 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 Palm Beach County. Nineteen sentinel chickens tested positive for antibodies to WNV this week in Citrus, Hillsborough, Indian River, Lee, Martin, Nassau, Orange, Pasco, Pinellas, Polk, Sumter, and Volusia counties. In 2019, positive samples from two humans, one blood donor, ten horses, one eagle, and 775 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 seven sentinel chickens have been reported from seven counties.

**EEEV activity:** No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. One sentinel chicken tested positive for antibodies to EEEV this week in Volusia County. In 2019, positive samples from 28 horses, one emu, one eagle, and 114 sentinel chickens have been reported from 31 counties.

**International Travel-Associated Dengue Fever Cases:** Eight cases of dengue fever were reported this week in persons that had international travel. In 2019, 391 travel-associated cases have been reported.

**Dengue Fever Cases Acquired in Florida:** Two 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:** Bay, Broward, Citrus, Duval, Hillsborough, Indian River, Sumter, Suwannee, and Volusia, 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, 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](http://wwwnc.cdc.gov/travel/notices). For a map of arboviral disease activity in the United States visit: [www.cdc.gov/arbonet/maps/ADB\\_Diseases\\_Map/index.html](http://www.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:** Three hundred ninety-one 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 (44), Charlotte, Citrus, Collier (4), Duval (6), Hillsborough (22), Lake (2), Lee (11), Manatee (2), Marion, Miami-Dade (224), Orange (17), Osceola (3), Palm Beach (25), Pasco (4), Pinellas (3), Polk, Putnam, Sarasota (2), Seminole (4), St. Lucie (5), and Volusia. Twenty-five 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			43	238
Jamaica		2	16			1		8	27
Dominican Republic	21							5	26
Honduras	1	10	1					6	18
Nicaragua		10					1	4	15
Haiti	7	1						4	12
India		3	3	1				3	10
Mexico	1	2						2	5
Venezuela	5								5
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
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
India/Malaysia								1	1
Malaysia/Singapore		1							1
Panama	1								1
<b>Total</b>	<b>55</b>	<b>221</b>	<b>25</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>84</b>	<b>391</b>

\* Serotyping for 27 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.

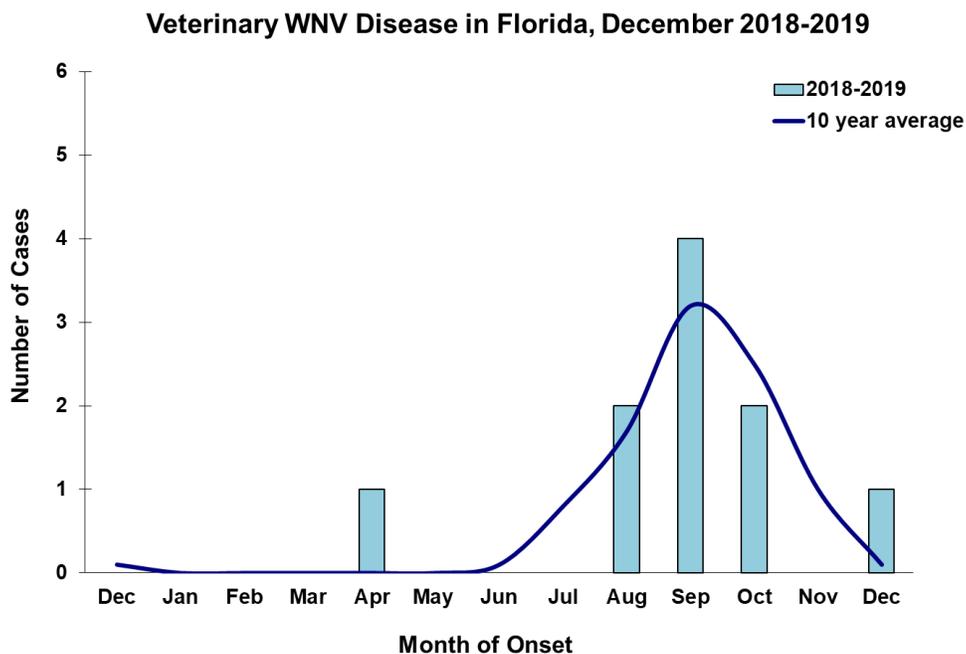
**International Travel-Associated Malaria Cases:** Sixty-four cases of malaria with onset in 2019 have been reported. Countries of origin were: Afghanistan, Angola (3), Central African Republic, Chad, Congo, Democratic Republic of the Congo (4), Gabon, Ghana (8), Guyana, India (4), Ivory Coast (6), Kenya (3), Liberia (3), Nicaragua, Nigeria (14), Papua New Guinea, Sierra Leone, Sudan, Togo, Uganda (4), Venezuela, and Zambia (3). Counties reporting cases were: Brevard (2), Broward (6), Duval (9), Hillsborough (5), Lake (2), Lee, Manatee, Miami-Dade (12), Okaloosa, Orange (8), Pasco (4), Pinellas (5), Polk (3), Seminole (3), Volusia and Washington. Twenty cases were reported in non-Florida residents.

Fifty cases (78%) were diagnosed with *Plasmodium falciparum*. Nine cases (14%) were diagnosed with *Plasmodium vivax*. Three cases (5%) were diagnosed with *Plasmodium ovale*. Two cases (3%) were diagnosed with *Plasmodium malariae*.

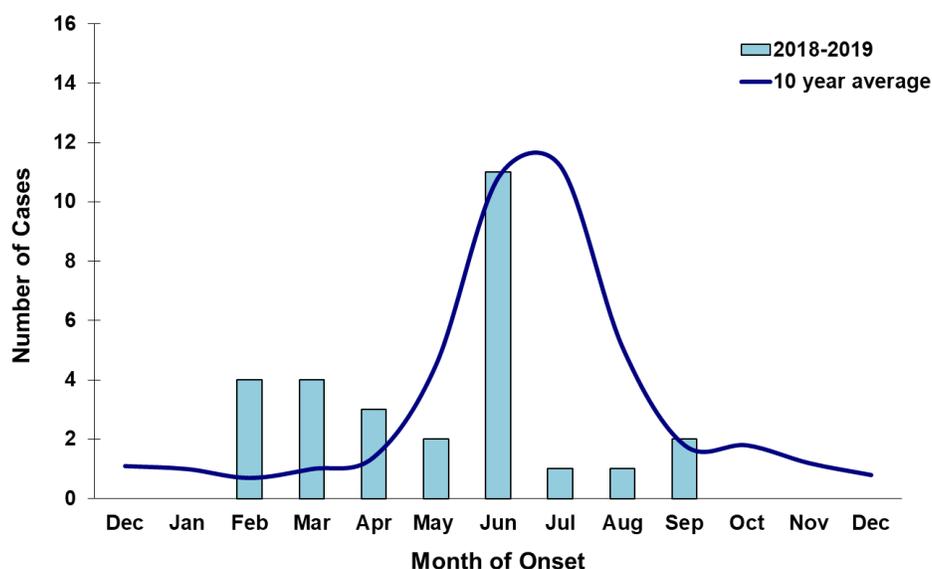
### Veterinary Cases\*

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

One horse with WNV infection was reported this week in Palm Beach County.



### Veterinary EEEV Disease in Florida, December 2018-2019



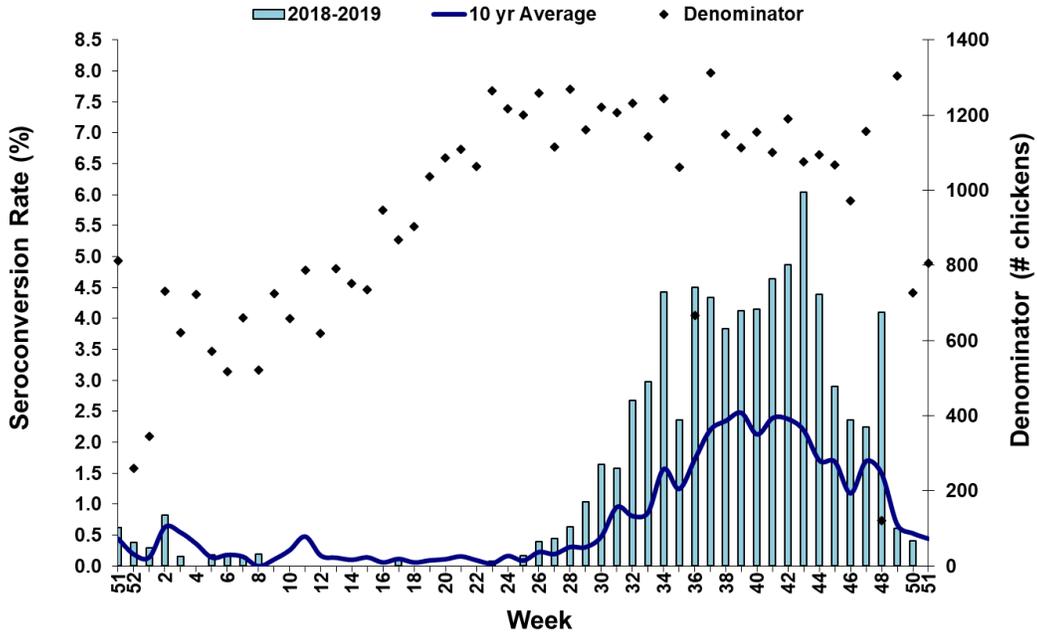
### Sentinel Chickens\*

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.

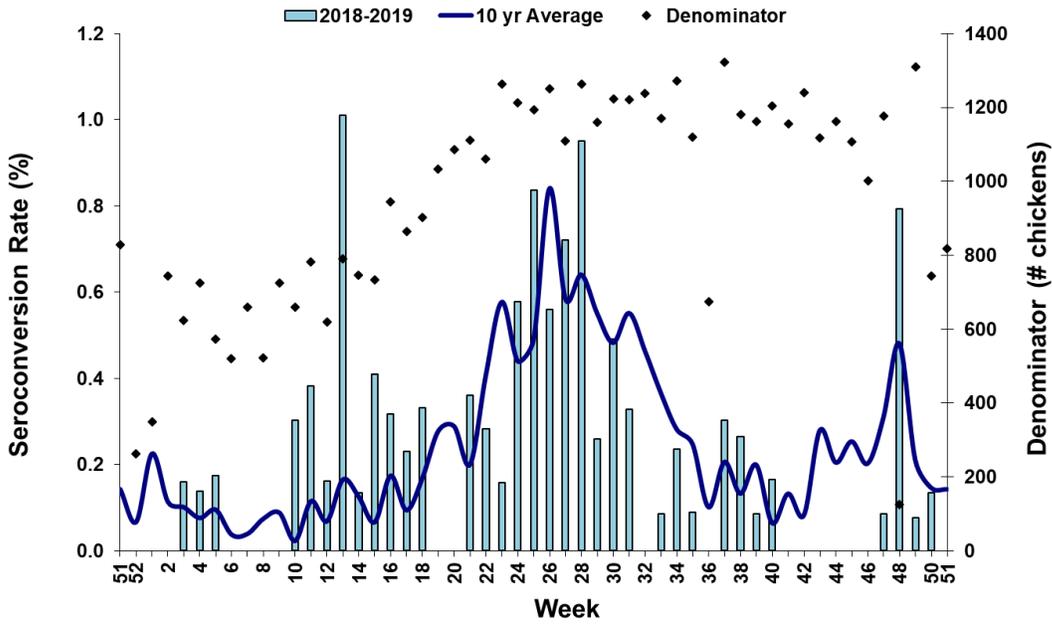
Nineteen sentinel chickens tested positive for antibodies to WNV this week in Citrus, Hillsborough, Indian River, Lee, Martin, Nassau, Orange, Pasco, Pinellas, Polk, Sumter, and Volusia counties. One sentinel chicken tested positive for antibodies to EEEV this week in Volusia County.

County	Collection Date	Seroconversion Rates (%)					County Totals		
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Citrus	10/29/19	5.45		5.45				3 WNV	76 WNV, 1 SLEV, 7 EEEV
	11/5/19	12.70		12.70				8 WNV	
	12/10/19	2.78		2.78				2 WNV	
Hillsborough	11/5/19	6.90		6.90				2 WNV	33 WNV, 1 SLEV
Indian River	11/7/19	15.91		15.91				7 WNV	69 WNV
	12/6/19	2.63		2.63				1 WNV	
Lee	11/5/19	14.29		14.29				2 WNV	40 WNV, 1 SLEV
Martin	11/1/19	10.81		10.81				4 WNV	22 WNV
Nassau	11/9/19	6.45		6.45				2 WNV	23 WNV, 9 EEEV
Orange	11/4/19	1.00		1.00				1 WNV	77 WNV, 7 EEEV
Pasco	12/11/19	2.13		2.13				1 WNV	25 WNV
Pinellas	11/12/19	4.26		4.26				2 WNV	12 WNV, 1 SLEV
Polk	11/4/19	6.67		6.67				2 WNV	35 WNV, 5 EEEV
Sumter	10/28/19	11.43		11.43				4 WNV	12 WNV, 1 SLEV, 1 EEEV
Volusia	11/11/19	8.33		8.33				4 WNV	62 WNV, 1 SLEV, 6 EEEV
	12/9/19				2.13	2.13		1 EEEV	

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

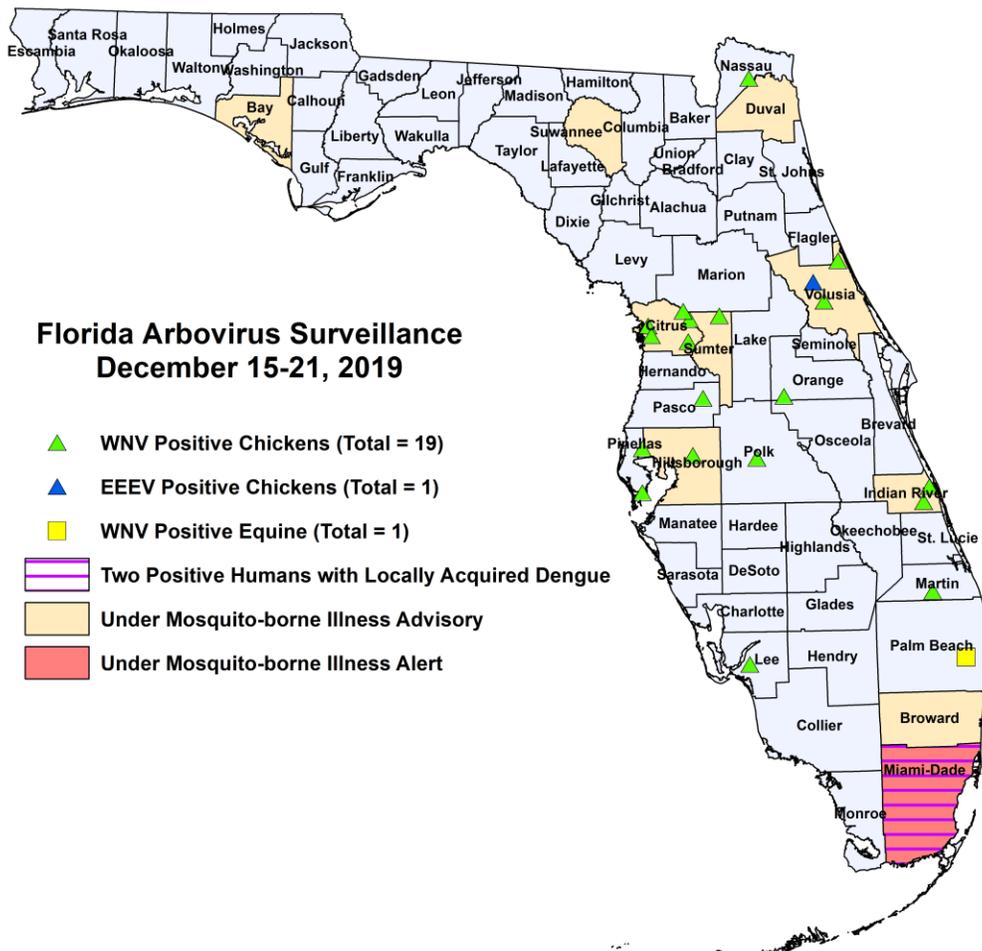
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 11 reports representing a total of 14 dead birds, including two raptors and one dove, were received from nine counties.

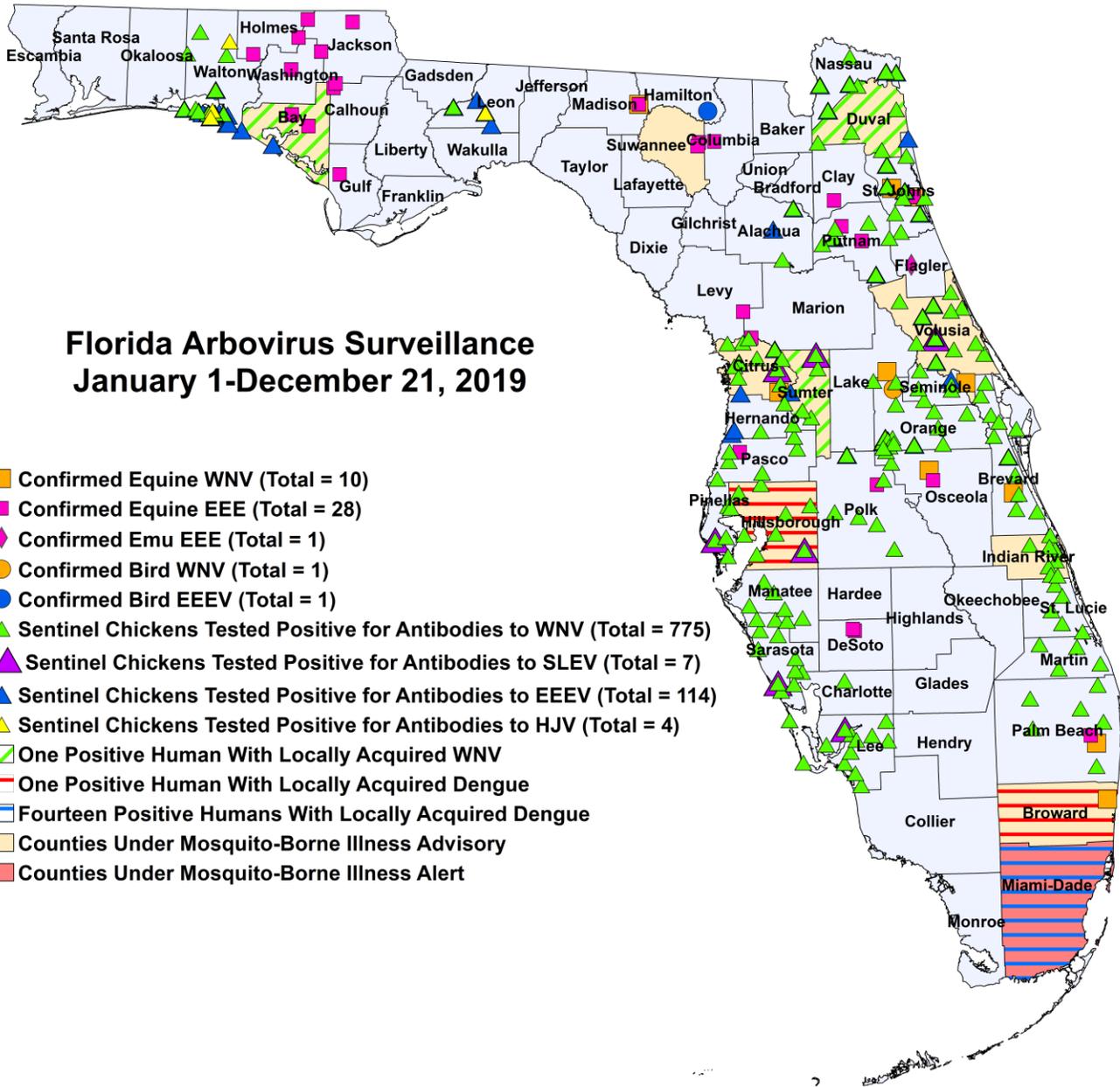
In 2019, 394 reports representing a total of 817 dead birds (14 crows, 15 jays, 90 raptors, and 44 doves) were received from 45 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to [www.myfwc.com/bird/](http://www.myfwc.com/bird/).

**2019**

County	Total Dead Birds	Crows	Jays	Raptors	Doves
Hillsborough	1	0	0	1	0
Lee	1	0	0	0	0
Monroe	1	0	0	0	0
Nassau	3	0	0	0	1
Palm Beach	4	0	0	0	0
Pinellas	1	0	0	1	0
Sarasota	1	0	0	0	0
St. Johns	1	0	0	0	0
St. Lucie	1	0	0	0	0

## Maps





## Florida Arbovirus Surveillance January 1-December 21, 2019

- Confirmed Equine WNV (Total = 10)
- 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 = 775)
- ▲ Sentinel Chickens Tested Positive for Antibodies to SLEV (Total = 7)
- ▲ Sentinel Chickens Tested Positive for Antibodies to EEEV (Total = 114)
- ▲ Sentinel Chickens Tested Positive for Antibodies to HJV (Total = 4)
- ▨ One Positive Human With Locally Acquired WNV
- ▨ One Positive Human With Locally Acquired Dengue
- ▨ Fourteen 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: 11 sentinels (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)

<b>Clay</b>	EEEV: 1 horse (9/20)
<b>Columbia</b>	EEEV: 1 horse (3/30)
<b>DeSoto</b>	EEEV: 2 horses (6/23, 7/2)
<b>Duval</b>	WNV: 1 human (July), 19 sentinels (9/9, 9/23, 10/7, 10/14, 10/21, 10/28, 11/12)
<b>Flagler</b>	EEEV: 1 emu (3/17)
<b>Gulf</b>	EEEV: 1 horse (2/27)
<b>Hamilton</b>	EEEV: 1 eagle (3/21)
<b>Hernando</b>	WNV: 8 sentinels (8/19, 9/9, 9/16, 9/23, 10/7, 10/21, 11/4) EEEV: 2 sentinels (3/4, 9/16)
<b>Hillsborough</b>	Dengue: 1 human (September) WNV: 33 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, 12/3) SLEV: 1 sentinel (10/15)
<b>Holmes</b>	EEEV: 3 horses (6/1, 6/5, 6/20)
<b>Indian River</b>	WNV: 69 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, 11/22, 11/26, 12/6)
<b>Jackson</b>	EEEV: 1 horse (6/19)
<b>Lake</b>	WNV: 1 horse (10/6)
<b>Lee</b>	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)
<b>Leon</b>	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)
<b>Levy</b>	EEEV: 1 horse (6/19)
<b>Madison</b>	WNV: 1 horse (4/1) EEEV: 1 horse (4/1)
<b>Manatee</b>	WNV: 9 sentinels (2/5, 10/7, 10/15, 10/22, 11/5, 11/20)
<b>Martin</b>	WNV: 22 sentinels (8/16, 8/29, 9/13, 9/20, 10/11, 10/25, 11/1, 11/15, 11/22, 11/25)
<b>Miami-Dade</b>	Dengue: 14 humans (March, July (2), August (2), September (5), October (2) December (2))
<b>Nassau</b>	WNV: 23 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)
<b>Orange</b>	WNV: 1 eagle (6/22), 77 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) EEEV: 7 sentinels (6/17, 7/11, 7/18, 7/25, 11/25)
<b>Osceola</b>	WNV: 1 horse (8/30) EEEV: 1 horse (6/10)
<b>Palm Beach</b>	WNV: 28 sentinels (7/8, 7/22, 8/5, 8/19, 9/9, 9/16, 9/23, 10/7, 10/21, 10/28) EEEV: 2 horses (2/25, 12/3)
<b>Pasco</b>	WNV: 25 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) EEEV: 1 horse (6/20)
<b>Pinellas</b>	WNV: 12 sentinels (8/26, 9/9, 10/14, 10/21, 11/4, 11/12, 11/18) SLEV: 1 sentinel (9/30)
<b>Polk</b>	WNV: 35 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)
<b>Putnam</b>	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)
<b>Sarasota</b>	WNV: 25 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, 11/12, 11/15, 11/22) SLEV: 1 sentinel (10/18)
<b>Seminole</b>	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)
<b>St. Johns</b>	WNV: 2 horses (9/7, 9/20), 54 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)
<b>St. Lucie</b>	WNV: 12 sentinels (8/1, 8/8, 8/15, 8/26, 9/6, 9/12, 9/25, 9/26, 10/3)

<b>Sumter</b>	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)
<b>Suwannee</b>	EEEV: 2 horses (6/4, 6/7)
<b>Volusia</b>	WNV: 1 horse (9/10), 62 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) SLEV: 1 sentinel (10/21) EEEV: 6 sentinels (1/14, 1/22, 1/28, 7/1, 7/15, 12/9)
<b>Walton</b>	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)
<b>Washington</b>	EEEV: 2 horses (5/28, 6/19)

### Acknowledgements and Data Sources

Contributors: Andrea Morrison, PhD, MSPH, Devin Rowe, MS, Catherine McDermott, MPH, MHS, and Danielle Stanek, DVM, DOH Bureau of Epidemiology; Lea Heberlein-Larson, DrPH; Alexis LaCrue, PhD, MS; Maribel Castaneda, and Valerie Mock, BS; 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](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:** [www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm](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: [www.floridahealth.gov/diseases-and-conditions/disease-reporting-and-management/disease-reporting-and-surveillance/index.html](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.