



Florida Arbovirus Surveillance Week 46: November 13-19, 2016

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 13-19, 2016 the following arboviral activity was recorded in Florida.

WNV activity: One asymptomatic blood donor was identified as WNV-positive in Gulf County. No horses with WNV infection were reported this week. Sixteen sentinel chickens tested positive for antibodies to WNV this week in Citrus, Duval, Flagler, Hillsborough, Lee, Manatee, Putnam, Sarasota, Volusia, and Walton Counties. In 2016, positive samples from 194 sentinel chickens, six humans, one blood donor, one horse, and five mosquito pools have been received from 25 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 2016, six positive samples from sentinel chickens have been received from two counties.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. Two sentinel chickens tested positive for antibodies to EEEV this week in Alachua and Orange Counties. In 2016, positive samples from 87 sentinel chickens and 23 horses have been received from 24 counties.

International Travel-Associated Dengue Fever Cases: No new cases of dengue fever were reported this week in persons that had international travel. In 2016, 40 travel-associated cases have been reported.

Dengue Fever Cases Acquired in Florida: No new cases of locally acquired dengue fever were reported this week in Miami-Dade County. In 2016, two 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 2016, six travel-associated cases have been reported.

Chikungunya Fever Cases Acquired in Florida: No cases of locally acquired chikungunya fever were reported this week. In 2016, no cases of locally acquired chikungunya fever have been reported.

International Travel-Associated Zika Fever Cases: Eighteen cases of Zika fever were reported this week in persons that had international travel. In 2016, 940 travel-associated cases have been reported.

Zika Fever Cases Acquired in Florida: Twelve cases of Zika fever were reported this week in persons that had no international travel. In 2016, 236 local cases have been reported.

Advisories/Alerts: Bay and Escambia Counties are currently under mosquito-borne illness alert. Duval, Jefferson, Manatee, Monroe, Polk, Okaloosa, Osceola, St. Johns, Santa Rosa, Walton, and Washington Counties are currently under mosquito-borne illness advisory. Thirty-seven counties are currently under a declared public health emergency due to the identification of travel-associated Zika infections: Alachua, Bay, Brevard, Broward, Charlotte, Citrus, Clay, Collier, Duval, Escambia, Flagler, Hernando, Highlands, Hillsborough, Indian River, Lake, Lee, Leon, Manatee, Marion, Martin, Miami-Dade, Monroe, Nassau,

Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, St. Johns, St. Lucie, Santa Rosa, Sarasota, Seminole, and Volusia Counties.

Florida has confirmed that local transmission of Zika virus is occurring in two areas in Miami-Dade County. One area is about 4.5 square miles in Miami Beach within the boundaries of 8th and 63rd streets. The second area is about one square mile within the boundaries of NW 79th St. to the North, NW 63rd St. to the South, NW 10th Ave. to the West and N. Miami Ave to the East. A map of the area along with public health recommendations can be seen at: <http://www.floridahealth.gov/newsroom/2016/10/101316-zika-update.html>. On Monday, September 19, the Zika zone in Wynwood was lifted after 45 days with no evidence of active Zika transmission.

There is a Level 2 (Alert) Travel Health Notice from the CDC for multiple countries in the Caribbean, Central and South America, Mexico, Cape Verde, 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 a Level 1 (Watch) Travel Health Notice from the CDC for multiple countries in the Caribbean, Central and South America, and Mexico, related to the transmission of chikungunya virus. Additional information on travel health notices can be found at the following link: <http://wwwnc.cdc.gov/travel/notices>.

2016 Human Case Summary*

West Nile Virus Illnesses Acquired in Florida: A total of six human cases of WNV illness acquired in Florida have been reported in 2016; one in Bay County (July), one in Duval County (August), two in Escambia County (August), one in Okaloosa County (July) and one in Santa Rosa County (August). One asymptomatic positive blood donor has been reported in Gulf County (October).

International Travel-Associated Chikungunya Fever Cases: Six cases of chikungunya with onset in 2016 have been reported in individuals with travel history to a chikungunya endemic country in the two weeks prior to onset. Countries of origin were Bahamas/Mexico, Bolivia (2), Brazil (2), and Jamaica. Counties reporting cases were Broward, Duval, Hillsborough, Palm Beach (2), and Pinellas.

International Travel-Associated Dengue Fever Cases: Forty cases of dengue with onset in 2016 have been reported in individuals with travel history to a dengue endemic country in the two weeks prior to onset. Countries of origin were: Brazil (3), Colombia (3), Costa Rica (5), Cuba (7), Dominican Republic (2), El Salvador, Ghana, Haiti (3), Honduras, Indonesia, Jamaica (5), Mexico, Puerto Rico (2), St. Barthelemy, Singapore, and Venezuela (3). Counties reporting cases were: Alachua (2), Brevard, Broward (8), Clay, Columbia, Hillsborough (2), Lee, Manatee, Miami-Dade (9), Monroe, Orange (5), Pinellas (2), Palm Beach (2), Sarasota, and Seminole (3). Two cases were reported in non-Florida residents. In 2016, 27 of the 40 cases of dengue reported in Florida have been serotyped by PCR. Additional serotyping and strain typing are being conducted.

	# of cases per serotype – 2016
DENV-1	8
DENV-2	6
DENV-3	8
DENV-4	5
	27

Dengue Fever Cases Acquired in Florida: In 2016, a total of two cases of locally acquired dengue fever have been reported; one in Monroe County (May) and one in Miami-Dade County (September). One of these cases was reported in a non-Florida resident.

International Travel-Associated Zika Fever Cases: Nine hundred forty 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: Anguilla, Antigua and Barbuda (3), Bahamas (8), Bahamas/Virgin Islands (2), Barbados (5),

Barbados/Dominica (2), Belize (2), Bolivia (4), Brazil (9), Brazil/Bolivia/Peru, Brazil/Caribbean, Brazil/Haiti, Caribbean (4), Cayman Islands, Central America, Colombia (40), Costa Rica (4), Costa Rica/Nicaragua, Cuba (6), Curacao (2), Curacao/Guyana, Dominica, Dominican Republic (133), Dominican Republic/Puerto Rico (3), Dominican Republic/Venezuela, Ecuador, El Salvador (7), Grenada (4), Guadeloupe (3), Guatemala (14), Guyana (6), Haiti (68), Haiti/Virgin Islands, Honduras (33), Honduras/Guatemala, Honduras/Mexico, Jamaica (105), Jamaica/Panama, Martinique (3), Mexico (29), Mexico/Caribbean, Mexico/Panama, Mexico/Trinidad and Tobago, Nicaragua (114), Panama, Puerto Rico (197), St. Barthelemy/St. Martin (2), St. Eustatius (3), St. Lucia, St. Martin (2), Suriname, Trinidad and Tobago (26), Venezuela (59), and Virgin Islands (15). Counties reporting cases were: Alachua (10), Bay (3), Brevard (15), Broward (153), Charlotte (2), Citrus (2), Clay (6), Collier (20), Duval (9), Escambia (4), Flagler (2), Hernando (4), Highlands, Hillsborough (35), Indian River, Lake (4), Lee (13), Leon (2), Manatee (5), Marion (3), Martin (3), Miami-Dade (300), Monroe (8), Nassau, Okaloosa (4), Okeechobee, Orange (129), Osceola (33), Palm Beach (54), Pasco (9), Pinellas (19), Polk (29), St. Johns (4), St. Lucie (11), Santa Rosa, Sarasota (5), Seminole (23), and Volusia (12). Fifty cases were reported in non-Florida residents. One Polk County case and one Lee County case were acquired through sexual transmission. Florida is monitoring a total of 161 pregnant women, all of whom are also included in our total case counts following a change in the national case definition.

Zika Virus Infections Acquired in Florida: In 2016, 236 locally acquired Zika virus infections have been reported by Miami-Dade (222), Broward (4), Duval (1), Palm Beach (8), and Pinellas (1) Counties. Twenty-two of these cases were reported in non-Florida residents. The Duval County case is believed to have been acquired in Miami-Dade County. Most infections were linked to two focal areas in Miami-Dade County; 38 cases (including 2 out of state residents) were linked to the Wynwood area and 77 cases (including 13 out of state residents) were linked to the Miami Beach area. In addition, 15 individuals (including 3 out of state residents) reported travel to both Florida and countries with widespread Zika virus transmission and exposure location could not definitively be determined.

International Travel-Associated Malaria Cases: Forty-one cases of malaria with onset in 2016 have been reported. Countries of origin were: Africa, Angola, Benin, Burkina Faso, Cameroon (2), Chad, Colombia, Democratic Republic of the Congo (2), Dominican Republic, Gabon, Ghana, Haiti (4), Honduras, India (2), Kenya, Nigeria (10), Sierra Leone (3), South Africa, Sudan, Uganda (3), and Venezuela (2). Counties reporting cases were: Alachua (2), Brevard (2), Broward (7), Duval (2), Flagler, Gadsden, Hernando, Hillsborough (4), Leon, Miami-Dade (8), Orange (7), Palm Beach, St. Lucie (2), Sarasota, and Volusia. Three cases were reported in non-Florida residents.

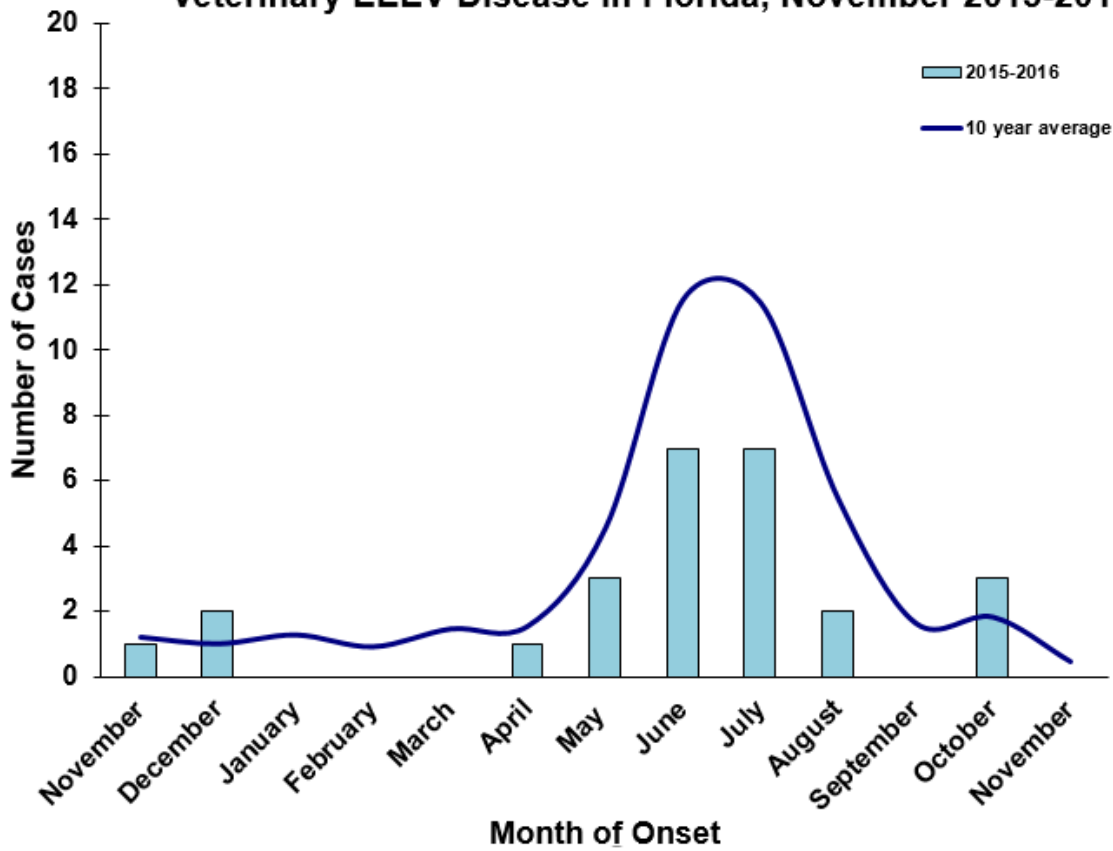
Thirty-three cases (81%) were diagnosed with *Plasmodium falciparum*. Six cases (15%) were diagnosed with *Plasmodium vivax*. One case (2%) was diagnosed with *Plasmodium malariae*. One case (2%) was diagnosed with *Plasmodium ovale*.

Veterinary Cases*

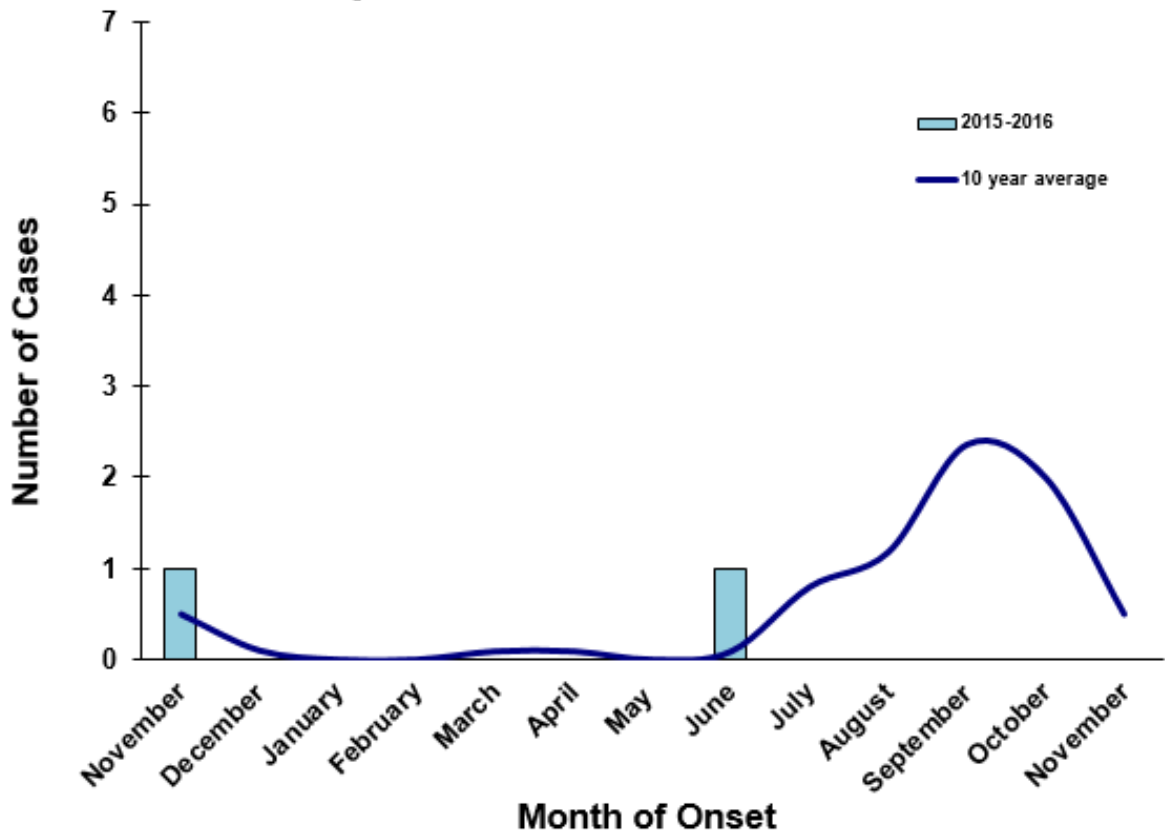
*Veterinary cases are reported by date of onset

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

Veterinary EEEV Disease in Florida, November 2015-2016



Veterinary WNV Disease in Florida, November 2015-2016



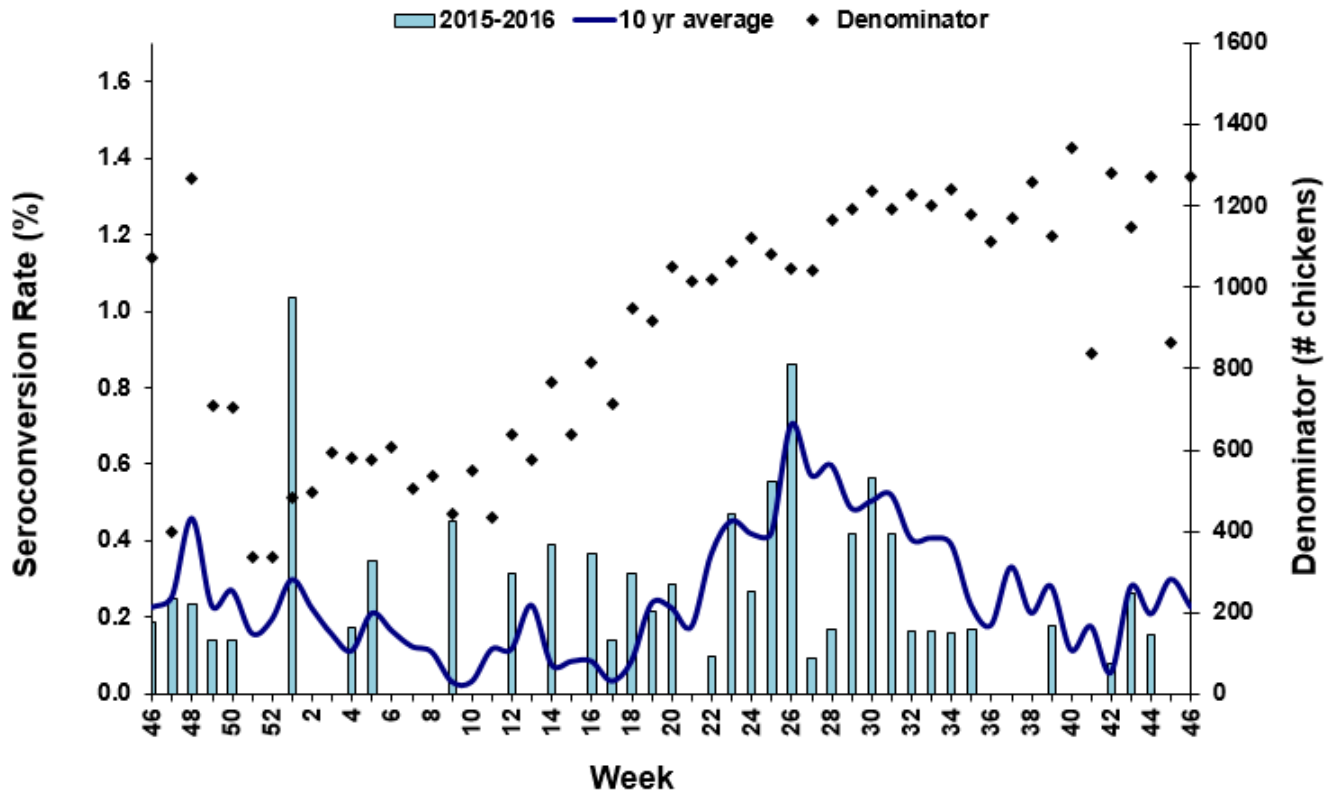
Sentinel Chickens*

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.

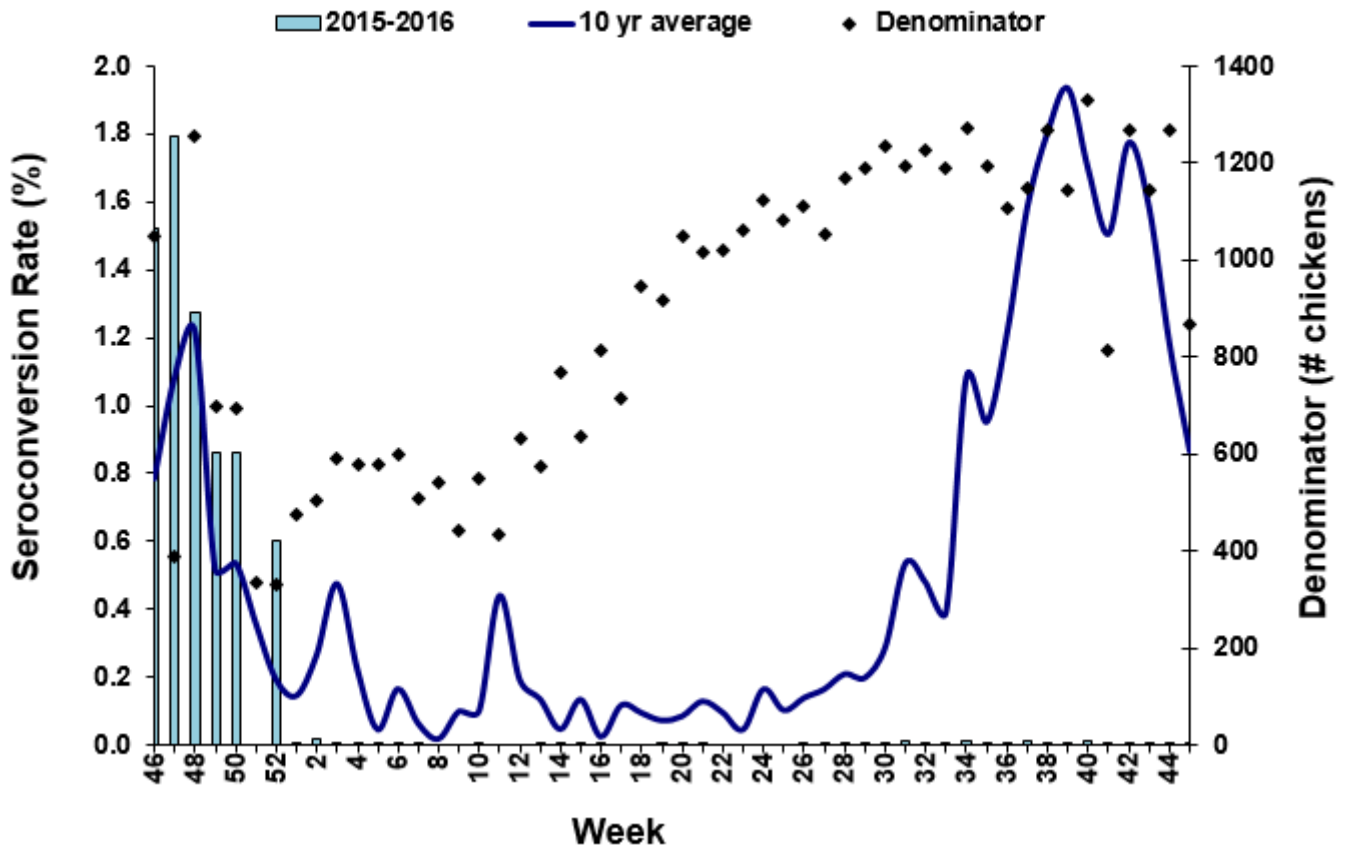
Sixteen sentinel chickens tested positive for antibodies to WNV this week in Citrus, Duval, Flagler, Hillsborough, Lee, Manatee, Putnam, Sarasota, Volusia, and Walton Counties. Two sentinel chickens tested positive for antibodies to EEEV this week in Alachua and Orange Counties.

County	Collection Date	Seroconversion Rates (%)					County Totals		
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Alachua	10/31/16				5.56	5.56		1 EEEV	3 EEEV, 3 WNV
Citrus	11/01/16	1.43		1.43				1 WNV	7 EEEV, 2 HJV, 9 WNV
Duval	10/17/16	2.86		2.86				1 WNV	1 WNV
Flagler	10/24/16	4.55		4.55				1 WNV	5 EEEV, 1 WNV
Hillsborough	10/18/16	1.22		1.22				1 WNV	14 WNV
Lee	10/18/16	3.17		3.17				2 WNV	9 WNV, 5 SLEV
Manatee	11/02/16	2.94		2.94	1.43	1.43		2 WNV, 1 EEEV	17 WNV, 1 EEEV
	11/08/16	1.47		1.47				1 WNV	
Orange	10/20/16				0.83	0.83		1 EEEV	7 WNV, 11 EEEV, 2 HJV
Putnam	10/19/16	4.55		4.55				1 WNV	1 EEEV, 2 WNV
Sarasota	10/17/16	1.52		1.52				1 WNV	10 WNV, 1 EEEV
Volusia	10/17/16	2.13		2.13				1 WNV	1 WNV
Walton	10/17/16	0.95		0.95				1 WNV	25 EEEV, 60 WNV, 3 HJV
	10/26/16	1.08		1.08				1 WNV	
	10/31/16	0.92		0.92				1 WNV	
	11/07/16	1.85		1.85				2 WNV	

Sentinel Seroconversions to EEEV in Florida, 2015-2016



Sentinel Seroconversions to WNV in Florida, 2015-2016



Mosquito Pools

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

County	Collection Week	Result	Species	County YTD

Dead Birds

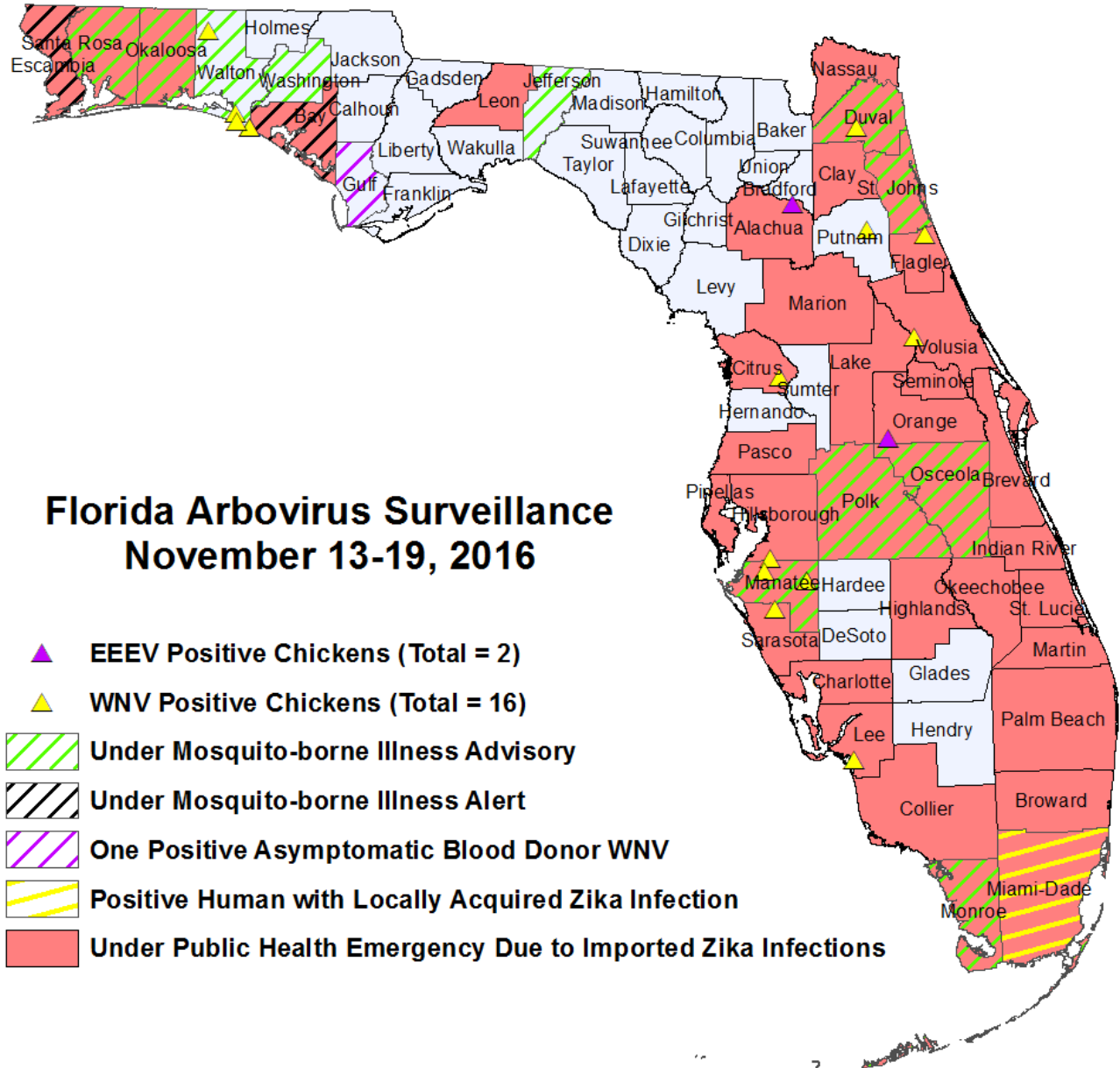
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 10 reports representing a total of 29 dead birds including 1 jay, 3 raptors, and 15 doves were received from 7 counties.

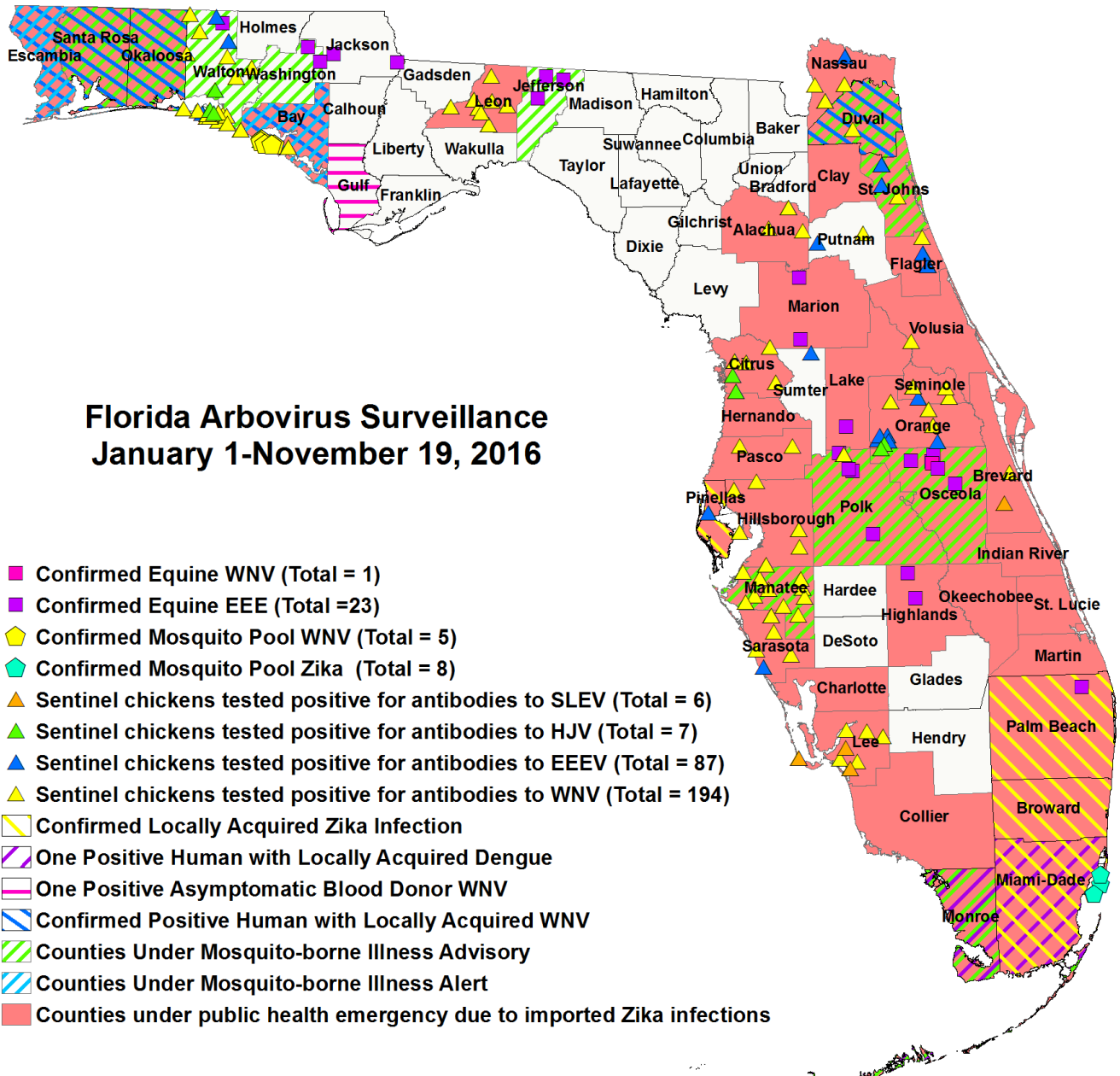
In 2016, 408 reports representing a total of 1304 dead bird (64 crows, 7 jays, 110 raptors, and 33 doves) were received from 47 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

2016

County	Total Dead Birds	Crows	Jays	Raptors	Dove
Bay	5	0	0	0	0
Collier	1	0	0	0	0
Gulf	15	0	0	0	15
Hillsborough	3	0	0	2	0
Indian River	1	0	0	1	0
Lee	3	0	0	0	0
Marion	1	0	1	0	0

Maps





2016 Arbovirus Activity by County	
County	Arbovirus Activity
Alachua	EEEV: 3 sentinels (7/18, 8/8, 10/31) WNV: 3 sentinels (9/26, 10/4)
Bay	EEEV: 1 sentinel (4/18) WNV: 1 human (July); 5 mosquito pools (6/1, 7/6, 8/3); 27 sentinels (6/27, 7/5, 7/18, 7/25, 8/1, 8/8, 8/15, 8/22)
Brevard	WNV: 1 sentinel (8/4) SLEV: 1 sentinel (9/14)
Broward	ZIKV: 4 humans (July, August, September)
Citrus	EEEV: 7 sentinels (1/4, 1/25, 2/29, 3/21, 5/31, 6/14, 8/2) HJV: 2 sentinels (2/1, 2/8) WNV: 9 sentinels (8/23, 10/3, 10/10, 10/18, 10/24, 11/1)
Duval	WNV: 1 human (August); 1 sentinel (10/17) ZIKV: 1 human (acquired in Miami-Dade, September)
Escambia	WNV: 2 humans (August)

Flagler	EEEV: 5 sentinels (5/2, 6/27, 7/18, 8/8) WNV: 1 sentinel (10/24)
Gulf	WNV: 1 asymptomatic blood donor (October)
Hillsborough	WNV: 14 sentinels (1/5, 1/12, 3/8, 4/20, 5/11, 5/24, 7/12, 8/3, 8/23, 10/18)
Highlands	EEEV: 2 horses (7/18, 10/25)
Jackson	EEEV: 2 horses (7/6, 7/16)
Jefferson	EEEV: 3 horses (6/16, 6/24, 7/24)
Lake	EEEV: 1 horse (8/3)
Lee	WNV: 9 sentinels (1/26, 8/23, 9/5, 9/19, 10/3, 10/4, 10/10, 10/17, 10/18) SLEV: 5 sentinels (7/12, 8/23, 9/5, 10/3)
Leon	EEEV: 9 sentinels (7/11, 7/18, 8/1, 8/29, 9/26, 10/24) WNV: 20 sentinels (7/25, 8/1, 8/8, 8/22, 8/29, 9/12, 9/20, 9/26, 10/3, 10/10)
Manatee	WNV: 17 sentinels (2/17, 7/26, 9/7, 9/14, 9/20, 9/27, 10/5, 10/12, 10/26, 11/2, 11/8) EEEV: 1 sentinel (11/2)
Marion	EEEV: 1 horse (8/13)
Miami-Dade	ZIKV: 222 humans (July, August, September, October); 8 mosquito pools (8/22, 8/23, 9/4, 9/9, 9/20, 9/23, 10/5) Dengue: 1 human (September)
Monroe	Dengue: 1 human (May)
Nassau	EEEV: 7 sentinels (5/13, 5/20, 6/30, 7/21, 7/28, 8/4, 10/27) WNV: 4 sentinels (5/26, 9/1, 9/15, 9/22)
Okaloosa	WNV: 1 human (July)
Orange	WNV: 7 sentinels (1/11, 1/26, 2/1, 2/8, 5/17, 6/27) EEEV: 11 sentinels (1/7, 2/4, 4/4, 4/25, 5/2, 5/17, 6/27, 10/20, 10/27) HJV: 2 sentinels (1/14, 1/21)
Osceola	EEEV: 5 horses (5/6, 6/22, 7/10, 7/15, 10/9) WNV: 1 horse (6/22)
Palm Beach	EEEV: 1 horse (5/31) ZIKV: 8 humans (July, August, September, October)
Pasco	WNV: 2 sentinels (8/10, 9/28)
Pinellas	EEEV: 1 sentinel (7/25) ZIKV: 1 human (August)
Polk	EEEV: 4 horses (4/4, 5/10, 6/19, 6/25); 3 sentinels (6/21, 7/25) WNV: 1 sentinel (7/18)
Putnam	EEEV: 1 sentinel (7/19) WNV: 2 sentinels (9/14, 10/19)
Santa Rosa	WNV: 1 human (August)
Sarasota	WNV: 10 sentinels (1/11, 1/15, 1/19, 2/1, 3/7, 4/8, 8/29, 9/19, 10/10, 10/17) EEEV: 1 sentinel (4/8)
Seminole	WNV: 5 sentinels (2/2, 4/4, 4/11, 5/17, 10/3) EEEV: 1 sentinel (5/9)
St. Johns	EEEV: 10 sentinels (6/6, 6/13, 6/20, 6/27, 8/15, 8/22) WNV: 1 sentinel (9/19)
Sumter	EEEV: 1 sentinel (9/27)
Volusia	WNV: 1 sentinel (10/17)
Walton	EEEV: 1 horse (6/17); 25 sentinels (1/4, 2/2, 2/29, 3/21, 4/4, 4/19, 5/2, 6/7, 6/20, 6/22, 6/27, 7/5, 7/13, 7/25, 7/27, 8/1, 8/22) WNV: 60 sentinels (1/11, 1/19, 2/2, 3/7, 3/29, 5/25, 8/1, 8/3, 8/8, 8/15, 8/22, 8/24, 8/29, 9/6, 9/14, 9/22, 9/26, 10/3, 10/5, 10/17, 10/26, 10/31, 11/7) HJV: 3 sentinels (1/26, 4/25, 8/29)
Washington	EEEV: 2 horses (6/23, 7/9)

Acknowledgements and Data Sources

Contributors: Andrea Bingham, PhD, MSPH, Shaiasia Itwaru-Womack, MPH, and Danielle Stanek, DVM, DOH Bureau of Epidemiology; Lea Heberlein-Larson, Lylah Seaton, 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: <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.