Florida Arbovirus Surveillance
Week 35: August 28-September 3, 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 August 28-September 3, 2016 the following arboviral activity was recorded in Florida.

WNV activity: One human case of WNV infection was reported this week in Escambia County. No horses with WNV infection were reported this week. Three mosquito pools tested positive for WNV this week in Bay County. Twenty-four sentinel chickens tested positive for antibodies to WNV this week in Bay, Lee, Leon, and Walton Counties. In 2016, positive samples from 96 sentinel chickens, three humans, one horse, and five mosquito pools have been received from 16 counties.

SLEV activity: No human cases of SLEV infection were reported this week. One sentinel chicken tested positive for antibodies to SLEV this week in Lee County. In 2016, two positive samples from sentinel chickens have been received from one county.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. Four sentinel chickens tested positive for antibodies to EEEV this week in St. Johns, and Walton Counties. In 2016, positive samples from 73 sentinel chickens and 19 horses have been received from 21 counties.

International Travel-Associated Dengue Fever Cases: Four 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 cases of locally acquired dengue fever were reported this week. In 2016, 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 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: Thirty-six cases of Zika fever were reported this week in persons that had international travel. In 2016, 625 travel-associated cases have been reported.

Zika Fever Cases Acquired in Florida: Thirteen cases of Zika fever were reported this week in persons that had no international travel. In 2016, 56 local cases have been reported.

Advisories/Alerts: Bay, Duval, Escambia, Jefferson, Monroe, Polk, Okaloosa, Osceola, St. Johns, Santa Rosa, and Washington Counties are currently under mosquito-borne illness advisory. Thirty-five 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, Hernando, Highlands, Hillsborough, Lake, Lee, Leon, Manatee, Marion, Martin, Miami-Dade, Monroe, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, St. Johns, St. Lucie, Santa Rosa, Sarasota, Seminole, and Volusia Counties.

Florida has confirmed local transmissions of Zika virus are occurring in two small areas in Miami-Dade County. Area One is just north of downtown. The exact location is within the boundaries of the following area: NW 5th Avenue to the west, US 1 to the east, NW/NE 38th Street to the north and NW/NE 20th Street to the south. Area Two is located in Miami Beach within the boundaries of 8th and 28th streets. A map of the areas along with public health recommendations can be seen at: http://www.floridahealth.gov/newsroom/2016/08/160822-zika-update.html

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, 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 four human cases of WNV illness acquired in Florida have been reported in 2016; one in Duval County (August), one in Escambia County (August), one in Okaloosa County (July) and one in Santa Rosa County (August).

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, one case of locally acquired dengue fever has been reported in Monroe County, with onset in May. This case was reported in a non-Florida resident.

International Travel-Associated Zika Fever Cases: Six hundred twenty-five 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, Bahamas, Barbados (2), Barbados/Dominica (2), Belize (2), Bolivia (3), Brazil (6), Brazil/Bolivia/Peru, Brazil/Caribbean, Caribbean, Colombia (35), Costa Rica (2), Cuba (3), Curacao/Guyana, Dominica (2), Dominican Republic (112), Dominican Republic/Puerto Rico (2), Ecuador, El Salvador (4), Grenada (4), Guadeloupe (2), Guatemala (11), Guyana (5), Haiti (32), Honduras (25), Honduras/Guatemala, Honduras/Mexico, Jamaica (81), Jamaica/Panama, Martinique (3), Mexico (12), Mexico/Caribbean, Mexico/Panama, Mexico/Turks and Caicos, Nicaragua (73), Puerto Rico (129), St. Lucia,

St. Martin (2), Suriname, Trinidad and Tobago (14), Venezuela (35), and Virgin Islands (5). Counties reporting cases were: Alachua (8), Bay (3), Brevard (12), Broward (101), Charlotte, Citrus (2), Clay (3), Collier (6), Duval (8), Escambia (2), Hernando (4), Highlands, Hillsborough (16), Lake (3), Lee (9), Leon (2), Manatee (3), Marion (2), Martin (2), Miami-Dade (173), Monroe (2), Okaloosa (2), Okeechobee, Orange (67), Osceola (27), Palm Beach (33), Pasco (7), Pinellas (16), Polk (21), St. Johns (3), St. Lucie (5), Santa Rosa, Sarasota (3), Seminole (19), and Volusia (8). Twenty-seven cases were reported in non-Florida residents. One Polk County case was acquired through sexual transmission. Forty-seven of the 625 cases involve pregnant women whose counties of residence are not included in the individual county totals to protect privacy. Florida has been monitoring pregnant women with evidence of Zika virus infection regardless of symptoms since January. Including the 47 pregnant cases mentioned, Florida is monitoring a total of 80 pregnant women.

Zika Virus Infections Acquired in Florida: In 2016, fifty-six locally acquired Zika virus infections have been reported by Miami-Dade (50), Broward (2), Palm Beach (3), and Pinellas (1) Counties. In addition, eight cases were reported in non-Florida residents. Most infections were linked to foci in Wynwood (29 cases) or Miami Beach (11 FL and 8 non-Florida residents) in Miami-Dade. Three Zika virus positive mosquito pools were also identified in the Miami Beach foci.

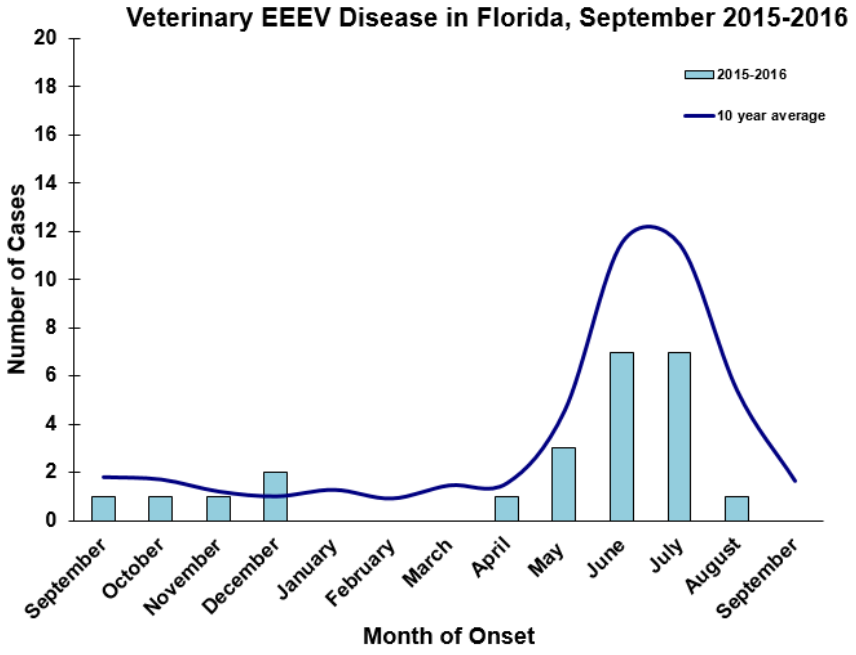
International Travel-Associated Malaria Cases: Forty-one cases of malaria with onset in 2016 have been reported. Countries of origin were: Africa, Angola, Benin, Burkina Faso, Cameroon (2), Chad, Colombia, Democratic Republic of the Congo (2), Dominican Republic, Gabon, Ghana, Haiti (4), Honduras, India (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 Counties, and Volusia. Three cases were reported in non-Florida residents.

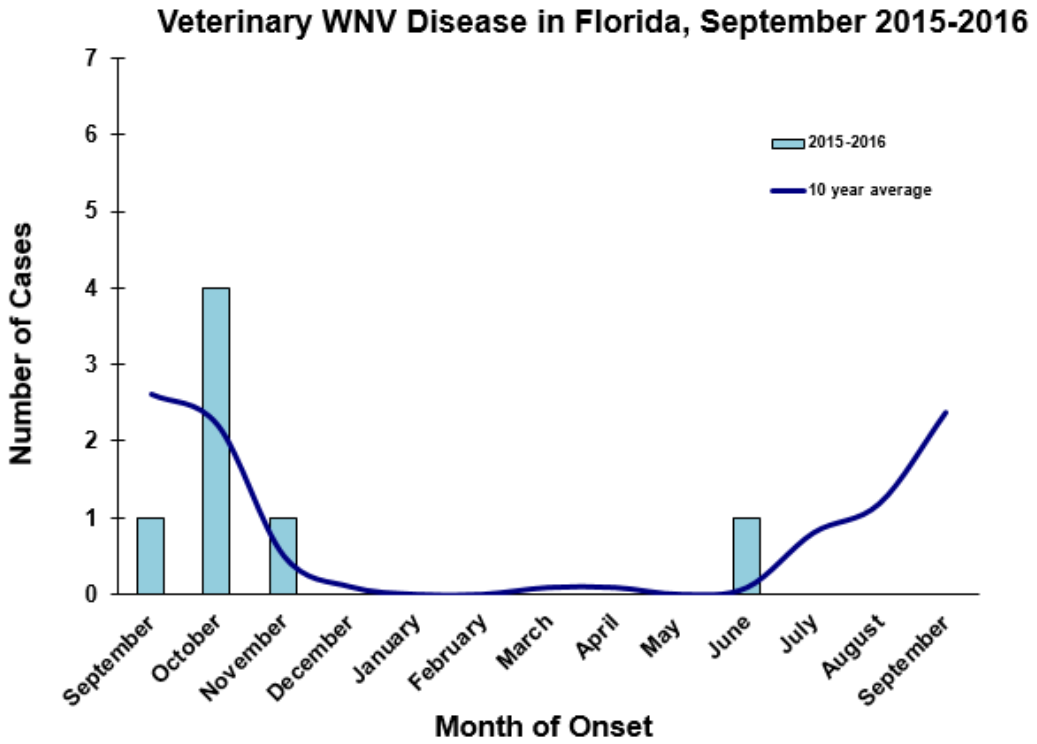
Thirty-three cases (81%) were diagnosed with *Plasmodium falciparum*. Six cases (15%) were diagnosed with *Plasmodium vivax*. One case (2%) was diagnosed with *Plasmodium malariae*. One case (2%) was diagnosed with *Plasmodium ovale*.

Veterinary Cases*

*Veterinary cases are reported by date of onset

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





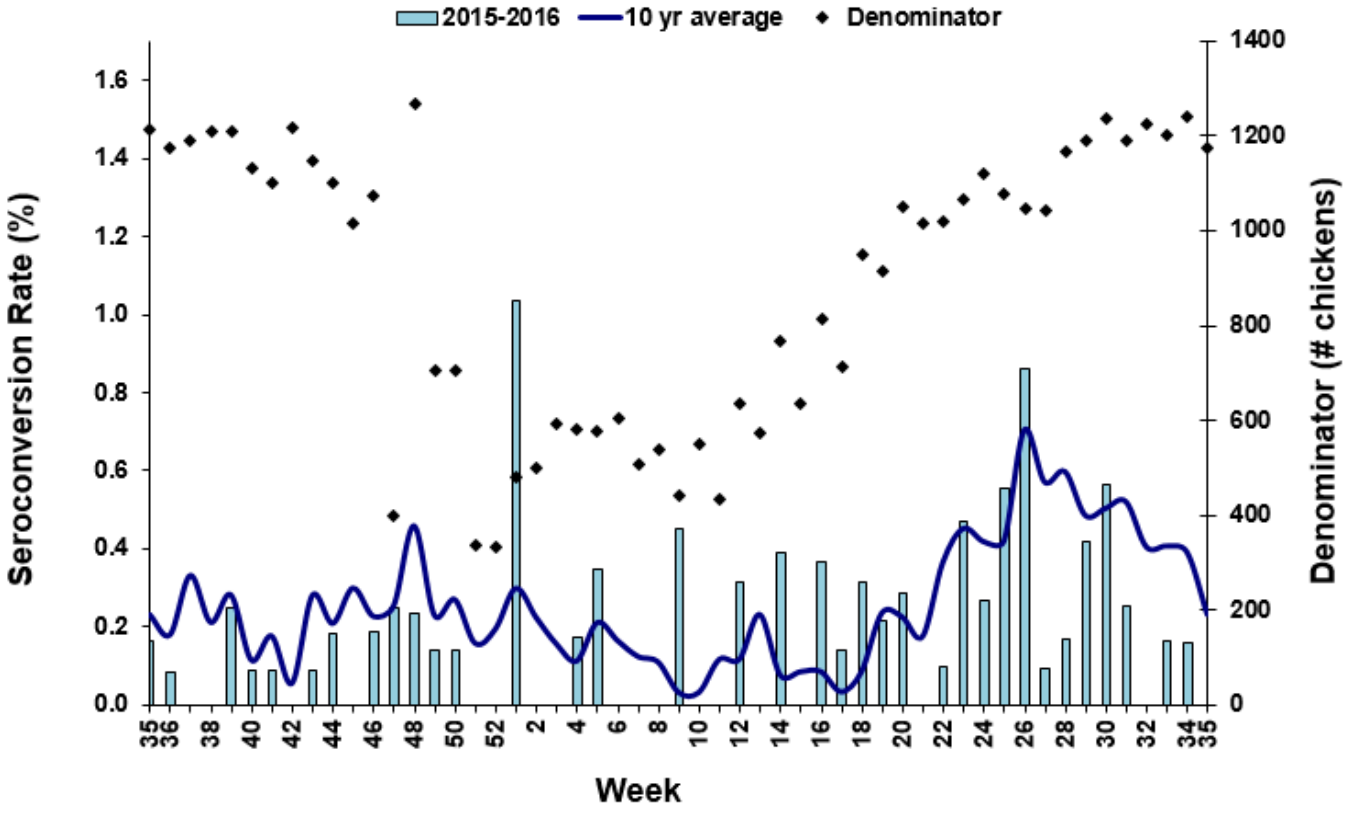
Sentinel Chickens*

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.

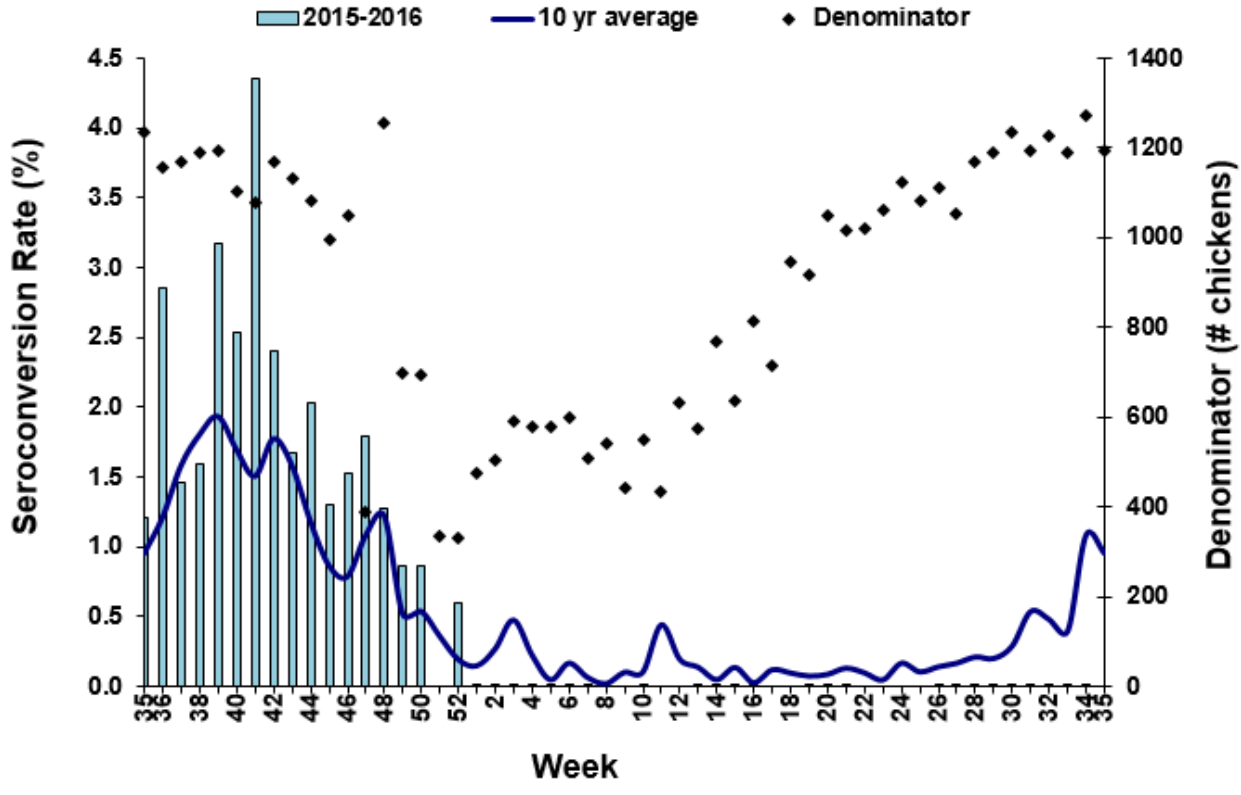
Twenty-four sentinel chickens tested positive for antibodies to WNV this week in Bay, Lee, Leon, and Walton Counties. One sentinel chicken tested positive for antibodies to SLEV this week in Lee County. Four sentinel chickens tested positive for antibodies to EEEV this week in St. Johns, and Walton Counties.

		Seroconversion Rates (%)						County Totals	
County	Collection Date	Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Bay	08/15/16	31.25		31.25				5 WNV	
	08/22/16	54.55		54.55				7 WNV	1 EEEV, 27 WNV
Lee	08/23/16	2.60	1.30	1.30				1 WNV, 1 SLEV	2 WNV, 2 SLEV
Leon	08/22/16	4.35		4.35				2 WNV	5 EEEV, 5 WNV
St. Johns	08/15/16				3.33	3.33		2 EEEV	
	08/22/16				1.69	1.69		1 EEEV	10 EEEV
Walton	08/15/16	2.80		2.80				3 WNV	
	08/22/16	6.19		6.19	0.90	0.90		7 WNV, 1 EEEV	25 EEEV, 29 WNV, 2 HJV

Sentinel Seroconversions to EEEV in Florida, 2015-2016



Sentinel Seroconversions to WNV in Florida, 2015-2016



Mosquito Pools

Three mosquito pools tested positive for WNV this week in Bay County. Three mosquito pools tested positive for Zika this week in Miami-Dade County.

County	Collection Date	Result	Species	County YTD
Bay	8/3/2016	WNV	*Cx. quinquefasciatus*	
Bay	8/3/2016	WNV	*Cx. quinquefasciatus*	
Bay	8/3/2016	WNV	*Cx. quinquefasciatus*	5 WNV
Miami-Dade	8/21-27 2016	Zika	*Aedes aegypti*	
Miami-Dade	8/21-27 2016	Zika	*Aedes aegypti*	
Miami-Dade	8/21-27 2016	Zika	*Aedes aegypti*	3 ZIKA

Dead Birds

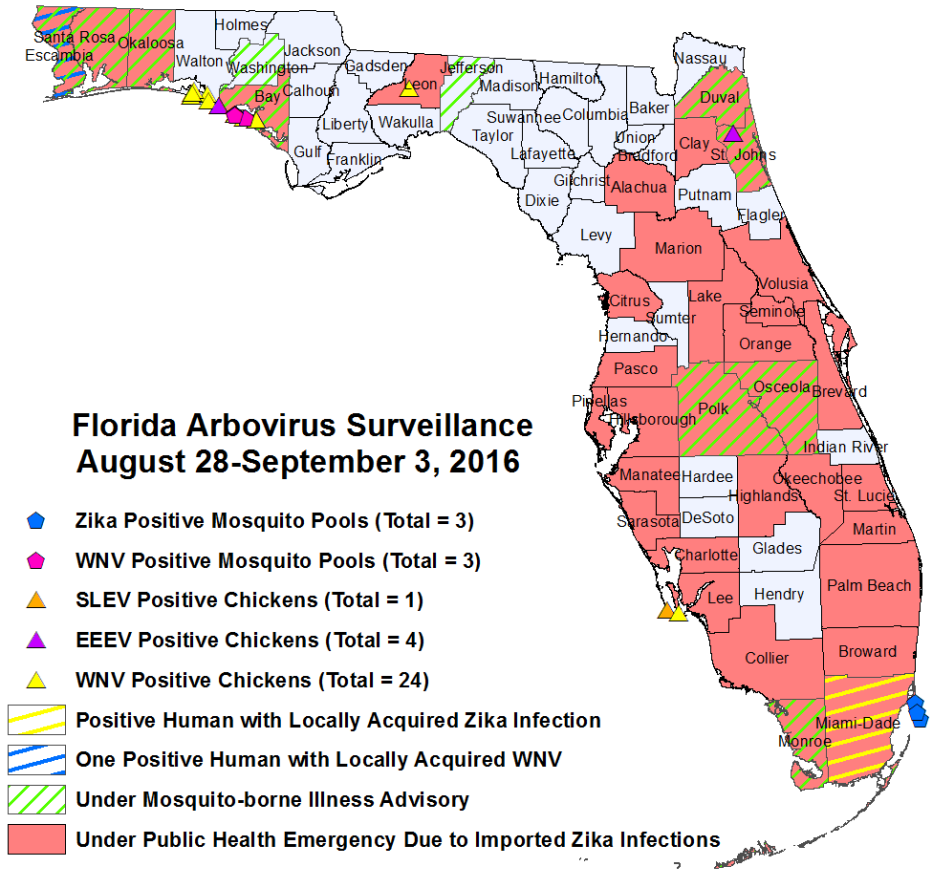
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 13 reports representing a total of 46 dead birds, including 1 crow, 8 raptors, and 1 dove were received from 6 counties.

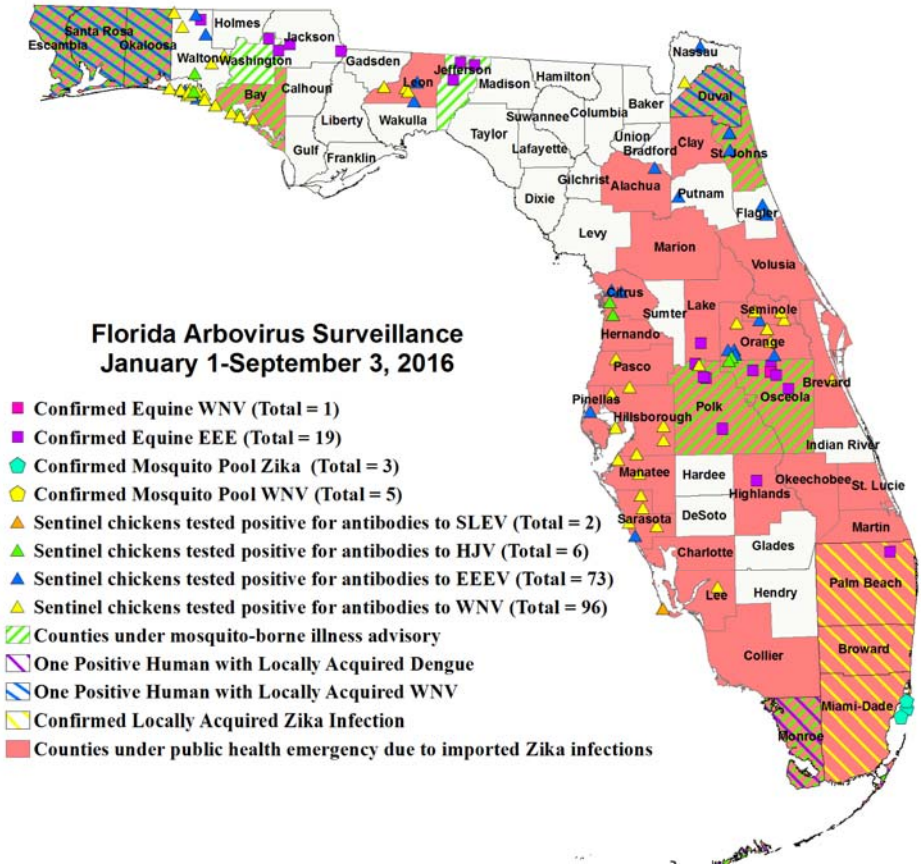
In 2016, 332 reports representing a total of 1101 dead birds (61 crows, 3 jays, 71 raptors, and 13 doves) were received from 47 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

2016

County	Total Dead Birds	Crows	Jays	Raptors	Dove
Bay	32	0	0	0	0
Dade	9	1	0	8	0
Marion	1	0	0	0	1
Pinellas	1	0	0	0	0
Polk	2	1	0	0	0
St. Johns	1	0	0	0	0

Maps


Florida Arbovirus Surveillance
August 28-September 3, 2016
Zika Positive Mosquito Pools (Total = 3)
WNV Positive Mosquito Pools (Total = 3)
SLEV Positive Chickens (Total = 1)
EEEV Positive Chickens (Total = 4)
WNV Positive Chickens (Total = 24)
Positive Human with Locally Acquired Zika Infection
One Positive Human with Locally Acquired WNV
Under Mosquito-borne Illness Advisory
Under Public Health Emergency Due to Imported Zika Infections
Santa Rosa
Escambia
Okaloosa
Holmes
Walton
Washington
Jackson
Bay
Calhoun
Gadsden
Leon
Jefferson
Madison
Hamilton
Suwannee
Taylor
Columbia
Baker
Nassau
Duval
Clay
St. Johns
Union
Bradford
Liberty
Wakulla
Gulf
Franklin
Lafayette
Gilchrist
Alachua
Dixie
Putnam
Flagler
Levy
Marion
Volusia
Citrus
Lake
Seminole
Sumter
Hernando
Orange
Pasco
Osceola
Brevard
Pinellas
Polk
Hillsborough
Indian River
Manatee
Hardee
Okeechobee
Highlands
St. Lucie
Sarasota
DeSoto
Martin
Charlotte
Glades
Lee
Hendry
Palm Beach
Collier
Broward
Miami-Dade
Monroe


Florida Arbovirus Surveillance
January 1-September 3, 2016
Confirmed Equine WNV (Total = 1)
Confirmed Equine EEE (Total = 19)
Confirmed Mosquito Pool Zika (Total = 3)
Confirmed Mosquito Pool WNV (Total = 5)
Sentinel chickens tested positive for antibodies to SLEV (Total = 2)
Sentinel chickens tested positive for antibodies to HJV (Total = 6)
Sentinel chickens tested positive for antibodies to EEEV (Total = 73)
Sentinel chickens tested positive for antibodies to WNV (Total = 96)
Counties under mosquito-borne illness advisory
One Positive Human with Locally Acquired Dengue
One Positive Human with Locally Acquired WNV
Confirmed Locally Acquired Zika Infection
Counties under public health emergency due to imported Zika infections
Santa Rosa
Escambia
Okaloosa
Holmes
Walton
Washington
Jackson
Bay
Calhoun
Gadsden
Leon
Jefferson
Madison
Hamilton
Suwannee
Taylor
Columbia
Baker
Nassau
Duval
Clay
St. Johns
Union
Bradford
Liberty
Wakulla
Gulf
Franklin
Lafayette
Gilchrist
Alachua
Dixie
Putnam
Flagler
Levy
Marion
Volusia
Citrus
Lake
Seminole
Sumter
Hernando
Orange
Pasco
Brevard
Pinellas
Osceola
Polk
Hillsborough
Indian River
Manatee
Hardee
Okeechobee
Highlands
St. Lucie
Sarasota
DeSoto
Martin
Charlotte
Glades
Lee
Hendry
Palm Beach
Collier
Broward
Miami-Dade
Monroe

2016 Arbovirus Activity by County	
County	**Arbovirus Activity**
Alachua	EEEV: 1 sentinel (7/18)
Bay	EEEV: 1 sentinel (4/18) WNV: 5 mosquito pool (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)
Broward	ZIKV: 2 humans (July)
Citrus	EEEV: 6 sentinels (1/4, 1/25, 2/29, 3/21, 5/31, 6/14) HJV: 2 sentinels (2/1, 2/8)
Duval	WNV: 1 human (August)
Escambia	WNV: 1 human (August)
Flagler	EEEV: 4 sentinels (5/2, 6/27, 7/18)
Hillsborough	WNV: 10 sentinels (1/5, 1/12, 3/8, 4/20, 5/11, 5/24, 7/12)
Highlands	EEEV: 1 horse (7/18)
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: 2 sentinels (1/26, 8/23) SLEV: 2 sentinels (7/12, 8/23)
Leon	EEEV: 5 sentinels (7/11, 7/18, 8/1) WNV: 5 sentinels (7/25, 8/1, 8/8, 8/22)
Manatee	WNV: 2 sentinels (2/17, 7/26)
Miami-Dade	ZIKV: 50 humans (July, August); 3 mosquito pools (Week 34)
Monroe	Dengue: 1 human (May)
Nassau	EEEV: 5 sentinels (5/13, 5/20, 6/30, 7/21, 7/28) WNV: 1 sentinel (5/26)
Okaloosa	WNV: 1 human (July)
Orange	WNV: 7 sentinels (1/11, 1/26, 2/1, 2/8, 5/17, 6/27) EEEV: 9 sentinels (1/7, 2/4, 4/4, 4/25, 5/2, 5/17, 6/27) HJV: 2 sentinels (1/14, 1/21)
Osceola	EEEV: 4 horses (5/6, 6/22, 7/10, 7/15) WNV: 1 horse (6/22)
Palm Beach	EEEV: 1 horse (5/31) ZIKV: 3 humans (July, August)
Pasco	WNV: 1 sentinel (8/10)
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)
Santa Rosa	WNV: 1 human (August)
Sarasota	WNV: 6 sentinels (1/11, 1/15, 1/19, 2/1, 3/7, 4/8) EEEV: 1 sentinel (4/8)
Seminole	WNV: 4 sentinels (2/2, 4/4, 4/11, 5/17) EEEV: 1 sentinel (5/9)
St. Johns	EEEV: 10 sentinels (6/6, 6/13, 6/20, 6/27, 8/15, 8/22)
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: 29 sentinels (1/11, 1/19, 2/2, 3/7, 3/29, 5/25, 8/1, 8/3, 8/8, 8/15, 8/22) HJV: 2 sentinels (1/26, 4/25)
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.