



Florida Arbovirus Surveillance

Week 4: January 24-30, 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 non-viral mosquito-borne disease is also included. During the period of January 24-30, 2016 the following arboviral activity was recorded in Florida.

[This report contains information for 2015 and 2016.](#)

WNV activity: One human case of WNV infection was reported this week in Sarasota County. No horses with WNV infection were reported this week. Three sentinel chickens tested positive for antibodies to WNV this week in Sarasota and Walton Counties. In 2016, positive samples from seven sentinel chickens have been received from three counties. In 2015, positive samples from 12 humans, two blood donors, six horses, 11 mosquito pools, and 446 sentinel chickens have been received from 28 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, there have been no positive samples reported. In 2015, positive samples from nine sentinel chickens have been received from seven counties.

EEEV activity: No human cases of EEEV infection were reported this week. No horses with EEEV infection were reported this week. No sentinel chickens tested positive for antibodies to EEEV this week. In 2016, positive samples from four sentinel chickens have been received from two counties. In 2015, positive samples from 82 sentinel chickens, 23 horses, and one goat have been received from 26 counties.

International Travel-Associated Dengue Fever Cases: Six cases of dengue fever were reported this week in persons that had international travel. In 2015, 87 travel-associated cases have been reported. In 2016, five cases have been reported.

Dengue Fever Cases Acquired in Florida: No cases of locally acquired dengue fever were reported this week. In 2015, 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 2015, 75 travel-associated cases have been reported.

Chikungunya Fever Cases Acquired in Florida: No cases of locally acquired chikungunya fever were reported this week. In 2015, no cases of locally acquired chikungunya fever have been reported.

International Travel-Associated Zika Fever Cases: Six cases of Zika fever were reported this week in persons that had international travel. In 2016, nine travel-associated cases have been reported. No cases of locally acquired Zika fever have been reported.

Advisories/Alerts: No counties are currently under mosquito-borne illness advisory or alert. 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 Samoa related to Zika virus transmission and a possible 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. While a travel health notice has not been issued for the recent locally acquired dengue fever cases in Hawaii, visitors should continue to take appropriate mosquito bite precautions while traveling. Additional information on travel health notices can be found at the following link: <http://wwwnc.cdc.gov/travel/notices>.

2015 Human Case Summary*

West Nile Virus Illnesses Acquired in Florida: A total of twelve human cases of WNV illness acquired in Florida have been reported in 2015; one in Duval County (November), four in Escambia County (July, August, and September), one in Hillsborough County (September), one in Marion County (October), one in Pinellas County (July), one in Sarasota County (December), one in Volusia County (July), and two in Walton County (June). Two asymptomatic positive blood donors have been reported in 2015; one in Hillsborough County (September) and one in Manatee County (October).

International Travel-Associated Chikungunya Fever Cases: Seventy-five cases of chikungunya with onset in 2015 have been reported in individuals with travel history to a chikungunya endemic country or area experiencing an outbreak in the two weeks prior to onset. Countries of origin were: Bolivia, Colombia (13), Dominican Republic, Ecuador, El Salvador (3), Guatemala (4), Haiti (2), Honduras (6), India (2), Jamaica (3), Mexico (12), Nicaragua (20), Puerto Rico (4), Trinidad and Tobago, Venezuela, and Virgin Islands. Counties reporting cases were: Brevard (2), Broward (10), Collier (2), Columbia, Duval (2), Escambia, Hardee, Hillsborough (3), Lake, Lee (2), Levy, Manatee, Martin, Miami-Dade (27), Monroe, Orange (3), Osceola, Palm Beach (6), Pinellas, Polk, Sarasota, Seminole (3), and Volusia (3). One case was reported in a non-Florida resident.

International Travel-Associated Dengue Fever Cases: Eighty-seven cases of dengue with onset in 2015 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, Brazil (5), Colombia, Costa Rica (3), Cuba (29), Dominican Republic (6), El Salvador, Guatemala, Haiti (11), Hawaii (3), Honduras, India (3), Jamaica, Mexico (3), Nicaragua (3), Philippines (4), Puerto Rico, Thailand, Venezuela (8), and Vietnam. Counties reporting cases were: Alachua, Broward (8), Clay (2), Collier, Duval, Flagler, Hernando, Hillsborough (7), Lee (2), Miami-Dade (42), Monroe (2), Orange (2), Osceola, Palm Beach (7), Pinellas (3), St. Johns, St. Lucie (3), and Seminole (2). Seven cases were reported in non-Florida residents. In 2015, 43 of the 87 cases of dengue reported in Florida have been serotyped by PCR. Additional serotyping and strain typing are being conducted.

	# of cases per serotype – 2015
DENV-1	10
DENV-2	16
DENV-3	10
DENV-4	6
DENV-1 and 3	1
	43

Five 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: Colombia, Cuba (2), Haiti, and Venezuela. Counties reporting cases were: Broward, Miami-Dade (2), Orange, and Sarasota. In 2016, all five 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-3	2
DENV-4	3
	5

Dengue Fever Cases Acquired in Florida: In 2015, one case of locally acquired dengue fever has been reported in Broward County, with onset in October.

International Travel-Associated Zika Fever Cases: Nine 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: Colombia (2), El Salvador, Haiti (3), and Venezuela (3). Counties reporting cases were: Hillsborough (2), Lee (2), Miami-Dade (4), and Santa Rosa.

International Travel-Associated Malaria Cases: Fifty-five cases of malaria with onset in 2015 have been reported. Countries of origin were: Afghanistan, Angola, Brazil, Cameroon (5), Central African Republic, Central/South America (2), Democratic Republic of the Congo/Uganda, Dominican Republic (2), Eritrea, Gabon, Ghana (7), Guatemala (2), Haiti (5), India (4), Kenya, Malawi, Niger, Nigeria (9), Papua New Guinea, South Sudan, Sudan (4), Tanzania (2), and Uganda. Counties reporting cases were: Alachua, Broward (10), Charlotte, Collier, Duval (3), Escambia, Flagler, Hillsborough (2), Lake, Lee (2), Manatee (2), Monroe, Miami-Dade (13), Okaloosa, Orange (5), Osceola (2), Pinellas (2), Palm Beach (3), Sarasota, and Volusia. Thirteen of the cases were reported in non-Florida residents.

Forty-one cases (75%) were diagnosed with *Plasmodium falciparum*. Twelve cases were diagnosed with *Plasmodium vivax* (22%). One case (2%) was diagnosed with *Plasmodium malariae*. One case was diagnosed with *Plasmodium ovale* (2%).

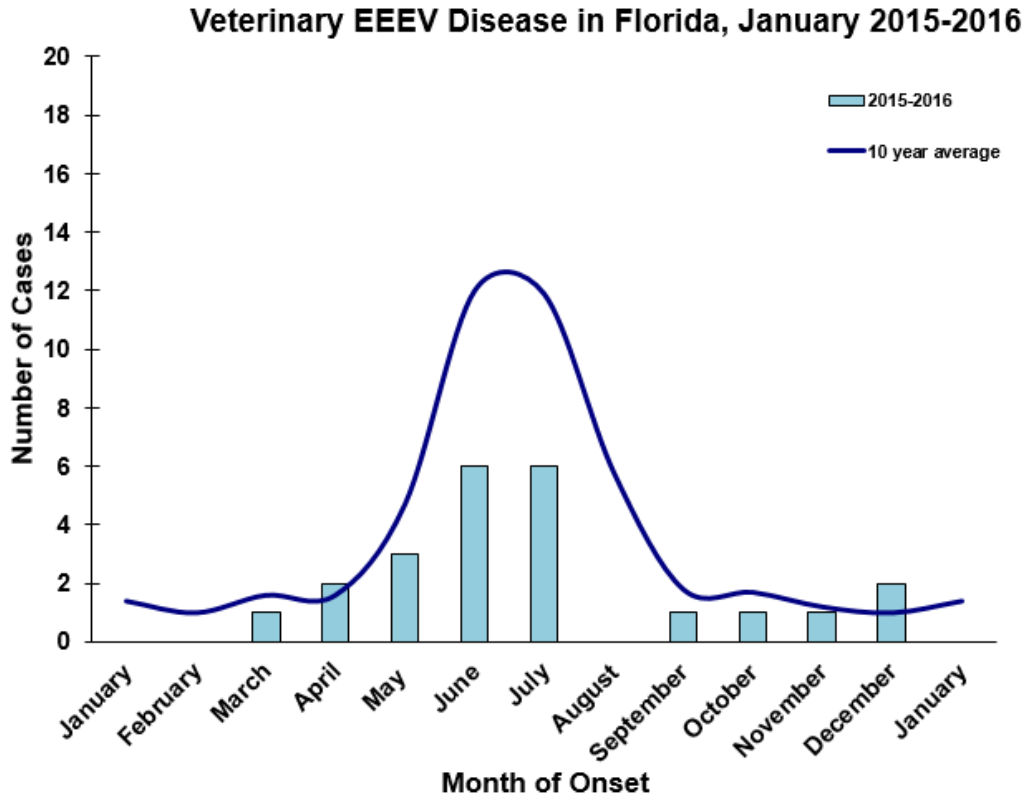
Two cases of malaria with onset in 2016 have been reported. Countries of origin were: Kenya and Uganda. Counties reporting cases were: Orange and Sarasota.

One case (50%) was diagnosed with *Plasmodium falciparum*. One case (50%) was diagnosed with *Plasmodium malariae*.

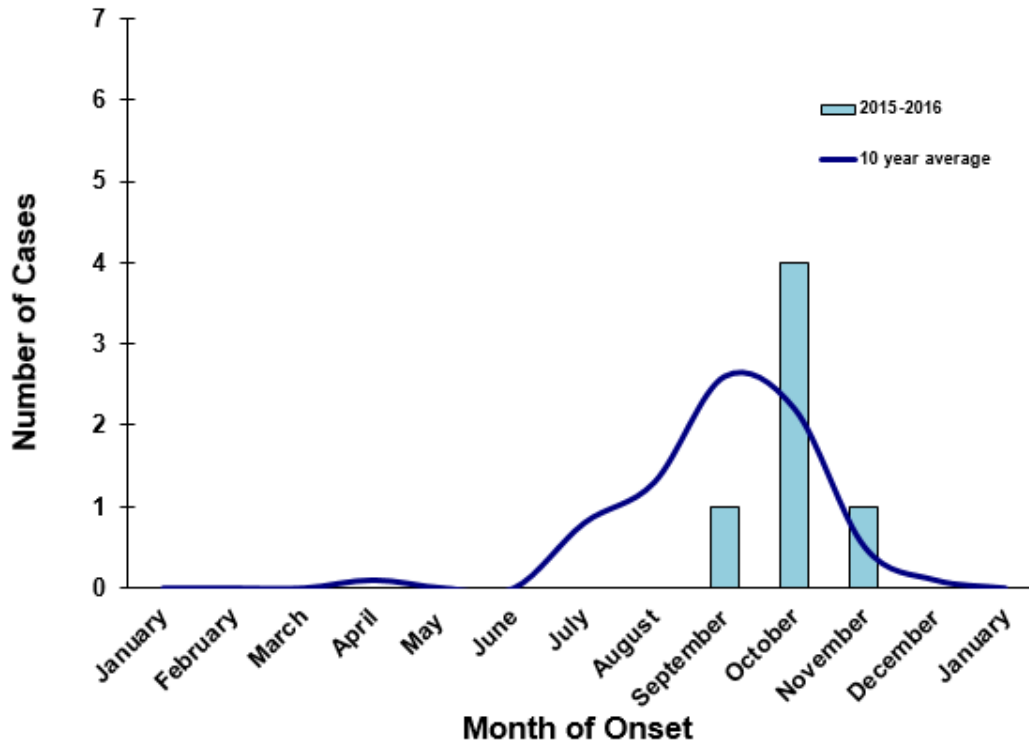
Veterinary Cases*

*Veterinary cases are reported by date of onset

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



Veterinary WNV Disease in Florida, January 2015-2016



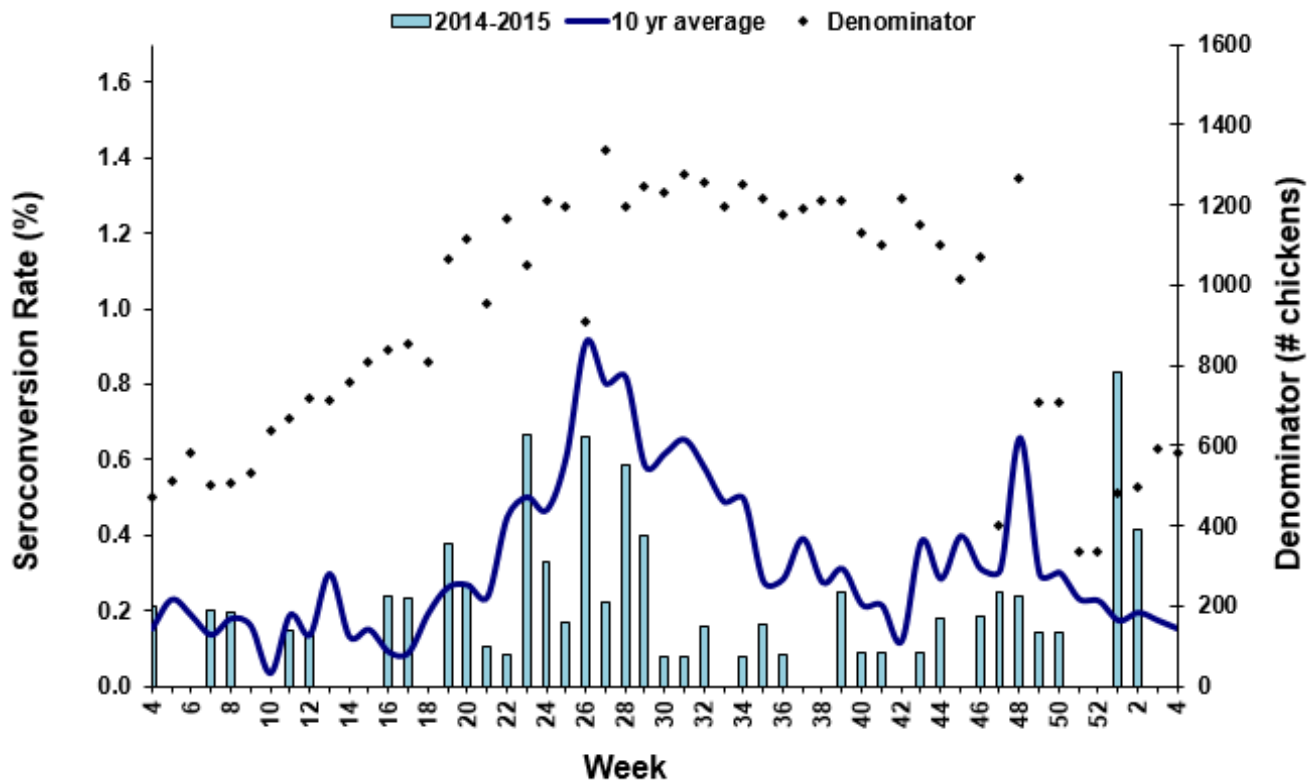
Sentinel Chickens*

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.

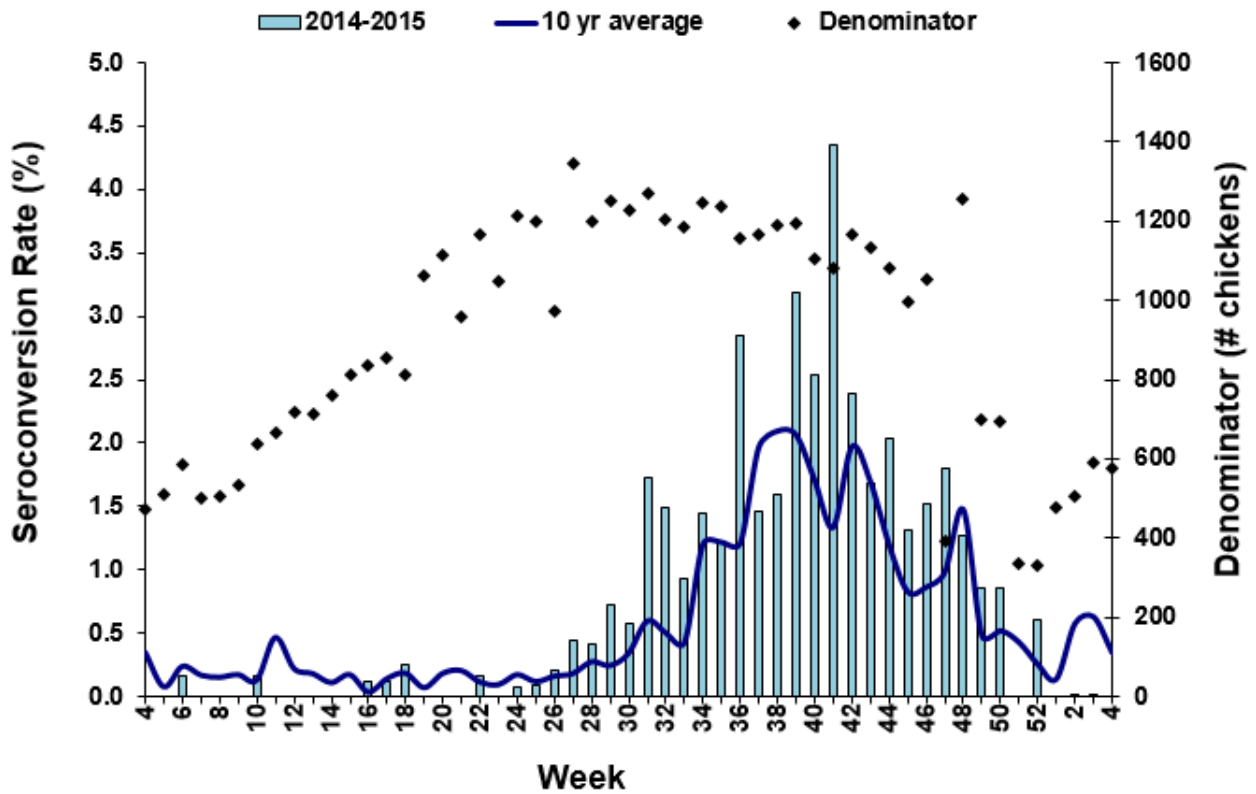
Three sentinel chickens tested positive for antibodies to WNV this week in Sarasota and Walton Counties.

County	Collection Date	Seroconversion Rates (%)						County Totals	
		Flavi	SLEV	WNV	Alpha	EEEV	HJV	Collection Week	YTD
Sarasota	01/15/16	3.51		3.51				2 WNV	3 WNV
	01/19/16	1.67		1.67				1 WNV	
Walton	01/19/16	1.01		1.01				1 WNV	3 EEEV, 3 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 or WNV this week.

County	Collection Date	Result	Species	County YTD

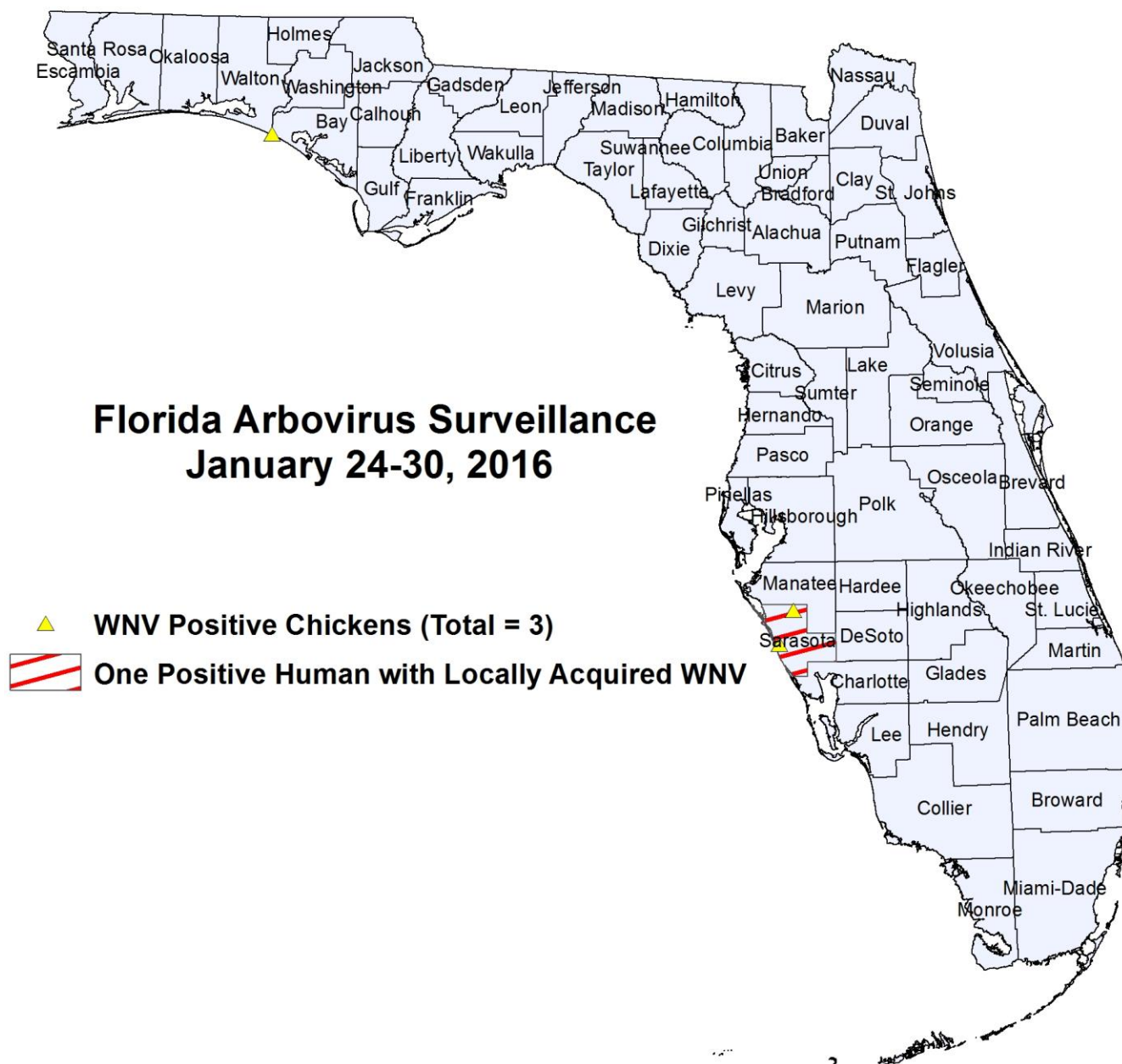
Dead Birds

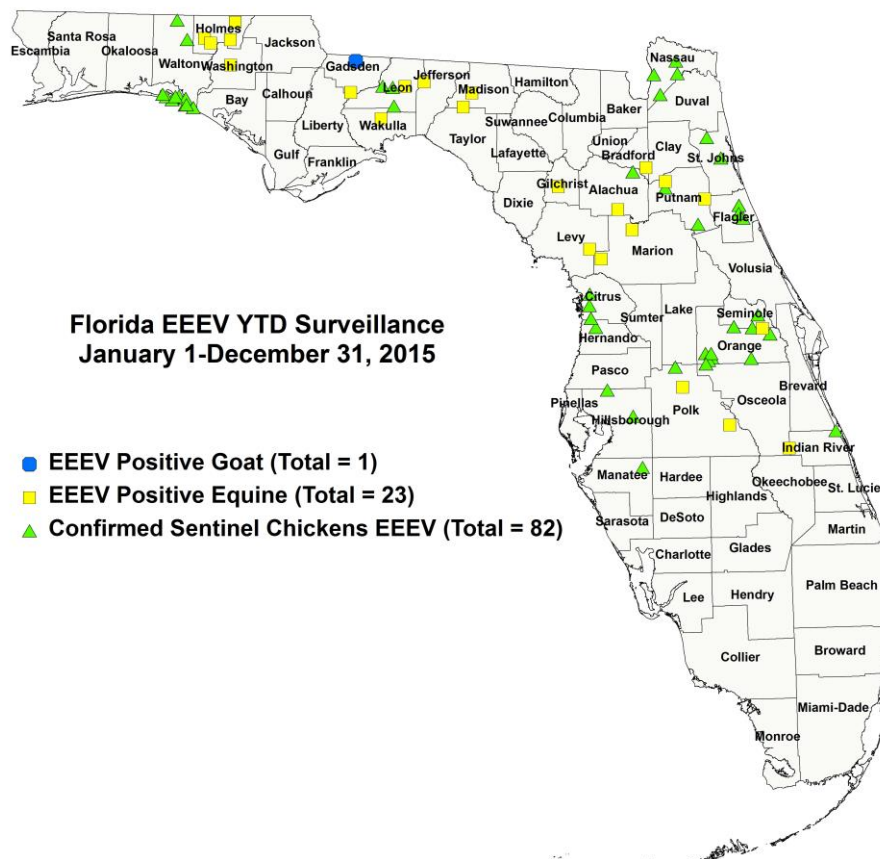
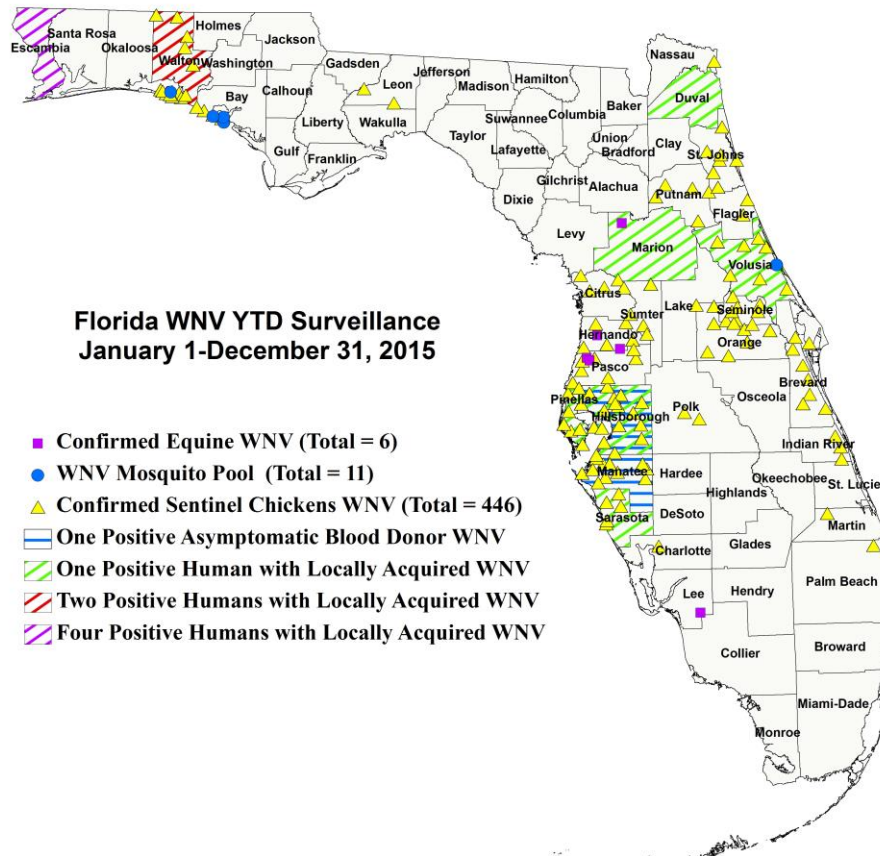
The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 13 reports representing a total of 51 dead birds, including 2 raptors were received from 4 counties.

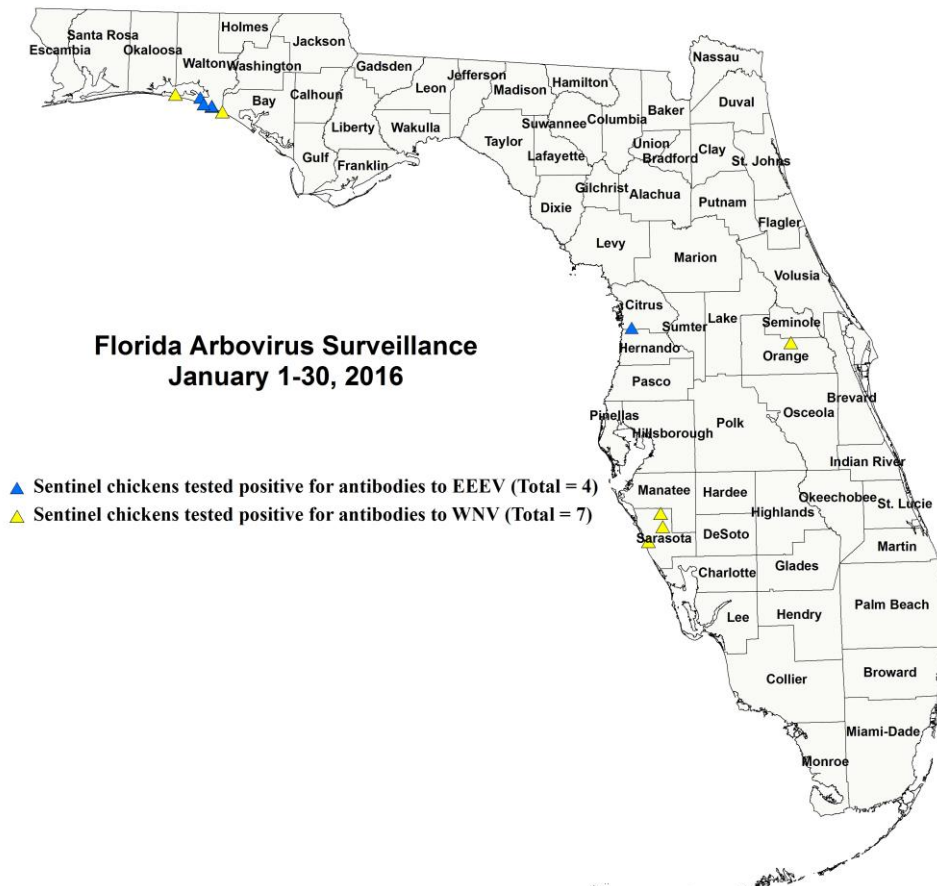
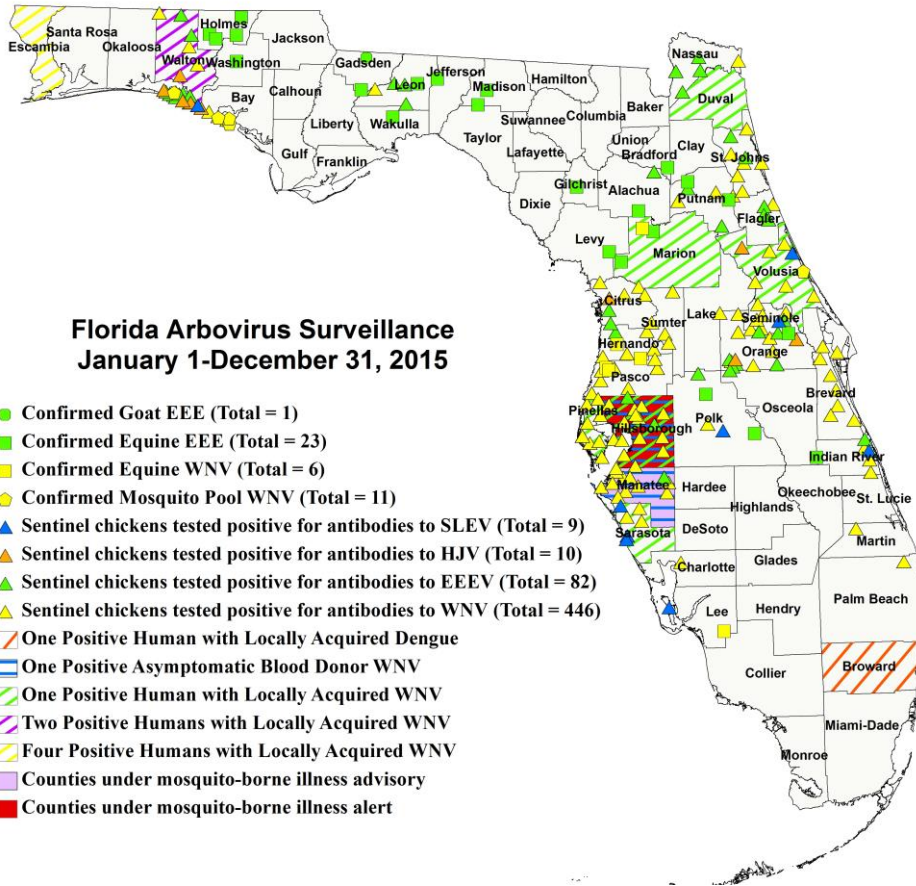
In 2016, 30 reports representing a total of 219 dead birds (30 crows, 0 jay, 8 raptors, and 0 doves) were received from 29 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

2016

County	Total Dead Birds	Crows	Jays	Raptors	Dove
Broward	3	0	0	0	0
Clay	1	0	0	1	0
Gulf	18	0	0	0	0
Hillsborough	1	0	0	0	0
Levy	1	0	0	0	0
Manatee	3	0	0	0	0
Manatee	1	0	0	0	0
Polk	1	0	0	0	0
Sarasota	1	0	0	0	0
Seminole	1	0	0	1	0
St. Johns	2	0	0	0	0
Suwannee	17	0	0	0	0
Volusia	1	0	0	0	0







2016 Arbovirus Activity by County

County	Arbovirus Activity
Citrus	EEEV: 1 sentinel (1/4)
Orange	WNV: 1 sentinel (1/11)
Sarasota	WNV: 3 sentinel (1/11, 1/15, 1/19)
Walton	EEEV: 3 sentinels (1/4) WNV: 3 sentinels (1/11, 1/19)

2015 Arbovirus Activity by County

County	Arbovirus Activity
Alachua	EEEV: 1 horse (6/16); 3 sentinels (7/13, 9/28)
Bay	WNV: 7 mosquito pools (7/29, 8/12); 12 sentinels (7/27, 8/4, 8/11, 8/14, 8/25, 9/1, 10/12, 11/9)
Brevard	WNV: 10 sentinels (6/24, 8/21, 8/26, 9/10, 9/23, 9/24, 10/14, 11/19)
Bradford	EEEV: 1 horse (4/23)
Broward	Dengue: 1 human (October)
Charlotte	WNV: 1 sentinel (8/21)
Citrus	EEEV: 7 sentinels (5/12, 11/2, 11/30, 12/7) HJV: 1 sentinel (7/6) WNV: 6 sentinels (9/14, 10/19, 11/2, 11/16, 11/30, 12/7)
Duval	WNV: 1 human (November)
Escambia	WNV: 4 humans (July, August, September)
Flagler	EEEV: 7 sentinels (4/27, 6/1, 6/29, 7/20, 8/10, 10/26) WNV: 4 sentinels (7/20, 9/8, 9/14, 11/9)
Gadsden	EEEV: 1 goat (6/16); 1 horse (6/21)
Gilchrist	EEEV: 1 horse (4/18)
Hernando	WNV: 2 horses (10/30, 11/7); 16 sentinels (9/8, 9/14, 10/5, 10/12, 10/19, 10/26, 11/2, 11/9, 11/17) EEEV: 1 sentinel (11/23)
Hillsborough	WNV: 1 human (September); 1 asymptomatic blood donor (September); 115 sentinels (3/10, 4/22, 5/5, 6/2, 7/7, 7/14, 7/21, 7/28, 8/4, 8/12, 8/18, 8/26, 9/1, 9/8, 9/15, 9/22, 9/29, 10/6, 10/14, 10/20, 10/28, 11/4, 11/9, 11/17, 11/23, 12/1, 12/8, 12/15, 12/17) EEEV: 2 sentinels (8/26, 9/1)
Holmes	EEEV: 4 horses (7/16, 9/8, 11/8, 12/22)
Indian River	EEEV: 1 sentinel (4/30) WNV: 6 sentinels (8/20, 9/18, 10/15, 12/2) SLEV: 1 sentinel (10/28)
Jefferson	EEEV: 1 horse (7/25)
Lee	SLEV: 1 sentinel (1/12) WNV: 1 horse (10/10)
Leon	EEEV: 1 horse (5/20); 3 sentinels (6/8, 7/13, 8/11) WNV: 2 sentinels (8/21, 8/28)
Levy	EEEV: 1 horse (12/7)
Madison	EEEV: 2 horses (6/24, 7/19)
Manatee	WNV: 1 asymptomatic blood donor (October); 39 sentinels (8/5, 8/25, 9/9, 9/23, 9/30, 10/7, 10/14, 10/20, 10/27, 11/4, 11/18, 11/20, 12/15, 12/18, 12/28) EEEV: 1 sentinel (11/20)
Marion	EEEV: 2 horses (6/14, 7/16) WNV: 1 human (October); 1 horse (9/28)
Martin	WNV: 2 sentinels (10/9, 10/16)
Nassau	EEEV: 7 sentinels (5/29, 7/3, 7/10, 7/13, 9/28, 10/2, 10/16) WNV: 1 sentinel (11/23)
Orange	EEEV: 1 horse (5/30); 16 sentinels (1/20, 1/29, 2/16, 2/23, 3/16, 4/20, 4/23, 5/18, 6/11, 6/29, 7/8, 7/13, 7/30, 12/17) HJV: 2 sentinels (5/15, 8/25) WNV: 28 sentinels (8/3, 8/10, 8/25, 8/31, 9/9, 9/28, 10/12, 10/19, 10/26, 11/2, 11/5, 11/9, 12/7)

Osceola	EEEV: 1 horse (5/3)
Palm Beach	WNV: 1 sentinel (4/27)
Pasco	WNV: 2 horses (10/12, 10/26); 32 sentinels (9/1, 9/22, 9/28, 10/6, 10/13, 10/20, 10/27, 11/4, 11/18, 11/23)
Pinellas	WNV: 1 human (July); 54 sentinels (6/29, 7/6, 7/20, 7/27, 8/3, 8/10, 8/17, 8/24, 8/31, 9/8, 9/14, 9/21, 9/14, 9/28, 10/5, 10/19, 10/26, 11/2, 11/9, 11/16)
Polk	EEEV: 2 horses (6/30, 7/6); 2 sentinels (6/22) WNV: 3 sentinels (9/29, 10/12, 10/19) SLEV: 1 sentinel (11/9)
Putnam	EEEV: 2 horses (3/16, 6/30); 2 sentinels (7/21, 10/6) WNV: 9 sentinels (7/21, 9/15, 9/22, 10/6, 10/20)
Sarasota	SLEV: 3 sentinels (7/13, 11/6) WNV: 1 human (December); 9 sentinels (9/4, 9/11, 9/18, 10/9, 10/19, 12/11, 12/18)
St. Johns	EEEV: 3 sentinels (6/8, 6/15, 7/6) WNV: 17 sentinels (7/27, 9/8, 9/14, 9/21, 9/28, 10/19, 10/26, 11/2, 11/16)
Seminole	EEEV: 4 sentinels (6/8, 6/29, 7/20, 8/31) WNV: 15 sentinels (8/10, 8/31, 9/8, 9/21, 9/28, 10/12, 10/26, 11/2, 11/30, 12/7) SLEV: 1 sentinel (9/8)
Sumter	WNV: 11 sentinels (1/20, 9/29, 10/13, 10/27, 12/1, 12/15)
Volusia	WNV: 1 human (July); 3 mosquito pools (6/2, 8/18); 16 sentinels (6/15, 7/13, 9/8, 9/21, 9/28, 11/2, 11/9, 11/16, 11/23, 11/30) SLEV: 1 sentinel (8/31) HJV: 1 sentinel (9/8)
Wakulla	EEEV: 1 horse (10/9)
Walton	EEEV: 23 sentinels (1/5, 1/13, 3/23, 5/11, 5/18, 6/8, 6/15, 6/29, 7/14, 7/20, 8/4, 9/8, 11/16, 11/30) HJV: 6 sentinels (1/13, 5/18, 6/8, 9/8, 11/3) WNV: 2 humans (June); 1 mosquito pool (7/27); 37 sentinels (2/9, 6/1, 6/29, 7/6, 7/20, 8/3, 8/10, 9/8, 9/14, 9/21, 10/5, 10/13, 10/19, 11/9, 11/10, 11/16, 11/30, 12/9) SLEV: 1 sentinel (9/8)
Washington	EEEV: 1 horse (7/3)

Acknowledgements and Data Sources

Contributors: Andrea Bingham, PhD, MSPH, Shaiasia Itwaru-Womack, MPH, Katherine Kendrick, 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.