

Florida 2009 Arbovirus Activity by County

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Summary

In 2009, 23 of Florida's 67 counties reported West Nile virus (WNV) activity and 37 counties reported Eastern Equine Encephalitis virus (EEEV) activity. In comparison, 13 counties reported WNV activity and 38 counties reported EEEV activity in 2008. St. Louis encephalitis virus (SLEV) activity was not reported in 2009 or 2008. Highlands J virus (HJV) activity was reported in 11 counties in 2009, compared to 15 in 2008.

Two locally-acquired human cases of WNV disease were reported in Lee and Miami-Dade counties in 2009. An additional case was reported in a Clay County resident who acquired the infection while visiting another state.

Mosquito-borne illness advisories due to above-average levels of EEEV activity in sentinel chickens and horses were issued in Clay, Columbia, Flagler, Lee, Leon, Madison, St. Johns, Seminole, Suwannee, Union, Volusia and Walton counties. Miami-Dade County issued an advisory in response to one human WNV disease case. The alert and advisories were lifted in December when the weather cooled and the level of virus activity returned to baseline. There were seven advisories issued in 2008.

An outbreak of dengue fever was identified in Key West in September, 2009. Twenty-two confirmed cases were identified as part of this outbreak, including one non-Florida resident. Thirty-six confirmed and probable cases of imported dengue fever were reported with disease onset in 2009 compared to 25 in 2008. Ninety-six confirmed cases of imported malaria were reported in 2009 compared to 65 in 2008. One individual acquired malaria via a blood transfusion.

Human Surveillance

West Nile virus (Florida Reporting Codes 6630 and 6631)

Two cases of locally-acquired WNV encephalitis were confirmed in Miami-Dade and Lee counties with onset dates in August and October, respectively. One case of WNV encephalitis was confirmed in a resident of Clay County, though the infection was acquired out-of-state.

Table 1. Locally-acquired human arbovirus cases reported in Florida, 2001-2009

Human Cases	2009	2008	2007	2006	2005	2004	2003	2002	2001
WNV	2 (2)*	2 (1)	2 (1)	0	21 (4)	42 (7)	94 (29)	35 (17)	11 (8)
EEEV	0	1(1)	0	0	5 (5)	0	3 (3)	1	3 (3)
SLEV	0	0	0	0	0	0	0	1	0

*Number of counties in parentheses

Dengue virus (Florida Reporting Code 6100)

Twenty-two cases of dengue fever were identified in Key West (Monroe County) as part of an outbreak persisting from July to October, 2009. In addition, 36 cases of imported dengue fever were reported in Florida with disease onset in 2009. Of these, one was confirmed and the

remaining cases were probable. Ten counties reported cases: Alachua, Brevard (3), Broward (6), Hillsborough (3), Miami-Dade (12), Orange (6), Osceola, Palm Beach, Sarasota (2), and St. Johns. Places of origin included Bolivia (2), Brazil, Colombia (2), Dominican Republic (3), Guatemala (2), Haiti (10), Honduras (2), India (3), Malaysia, Mexico, Nicaragua, Panama (3), Philippines, Puerto Rico (3), and Suriname. Twenty-three (64%) were hospitalized.

Malaria (Florida Reporting Code 08460)

Ninety-six cases of imported malaria (a mosquito-borne parasite) were reported in Florida with disease onset in 2009. All were confirmed. Ten counties reported cases: Alachua (2), Broward (26), Clay, Duval (5), Escambia, Hillsborough (2), Lee, Leon (2), Marion, Miami-Dade (21), Okaloosa, Orange (8), Palm Beach (11), Pasco (2), Pinellas (3), Polk (3), Seminole (3), St. Lucie (2), and Volusia. Places of origin included: Cameroon, Colombia, Congo, Dominican Republic (2), Ghana (6), Guinea (2), Guyana (3), Haiti (41), Honduras, India (7), Kenya, Malawi (3), Mexico (2), Nigeria (12), Pakistan, Sierra Leone (3), South Africa, Sudan, Thailand, Togo, Uganda, Zambia, unspecified African country (2), unknown. Malarial species identified was *Plasmodium falciparum* in 74 (77%) cases, 14 (15%) were *Plasmodium vivax*, one case was *Plasmodium ovale*, and the remainder were undetermined. Seventy-eight (81%) were hospitalized, two were reported as fatal. One individual in Manatee County acquired malaria via a blood transfusion.

Animal Surveillance

Eastern Equine Encephalitis virus surveillance

Positive samples from 75 equines, 1 captive bird, 208 sentinel chickens, 3 mosquito pools, and 115 live wild birds were received. To date, 37 of Florida's 67 counties have reported EEEV activity. Date of disease onset (equines, mammals, captive birds), date of collection (dead birds, mosquito pools), and date of first known antibody positive bleed (sentinels, live wild birds) is shown in parentheses.

Alachua: 2 horses (6/8, 8/16); 6 sentinel chickens (6/8, 8/24, 9/28, 11/2, 11/9)

Baker: 1 horse (7/13)

Bay: 1 sentinel chicken (6/16)

Bradford: 3 horses (5/22, 6/19, 6/28)

Citrus: 2 sentinel chickens (11/16, 12/21)

Clay: 5 horses (5/16, 6/12, 6/14, 6/16, 7/8)

Columbia: 6 horses (5/22, 5/22, 5/29, 6/15, 7/14, 7/16)

Duval: 3 horses (6/7, 6/27, 7/16)

Flagler: 1 horse (3/14); 10 sentinel chickens (4/6, 7/20, 7/27, 8/10, 8/24, 11/23)

Gilchrist: 2 horses (1/9, 6/15)

Gulf: 7 sentinel chickens (2/16, 4/6, 6/22, 6/29, 7/6, 7/28, 8/10)

Hamilton: 1 horse (5/25)

Hernando: 1 horse (10/21); 1 sentinel chicken (10/19)

Hillsborough: 1 sentinel chicken (11/23)

Holmes: 2 horses (6/28, 7/7)

Jackson: 1 horse (6/3)

Lake: 2 horses (3/15, 9/15)

Leon: 4 horses (6/13, 6/14, 7/19, 11/4); 19 sentinel chickens (6/1, 6/9, 6/16, 6/22, 7/7, 10/12, 10/19, 10/26, 11/2, 11/9, 11/16)

Levy: 3 horses (1/8, 8/10, 8/24)

Madison: 4 horses (6/23, 6/26, 7/1, 7/18)

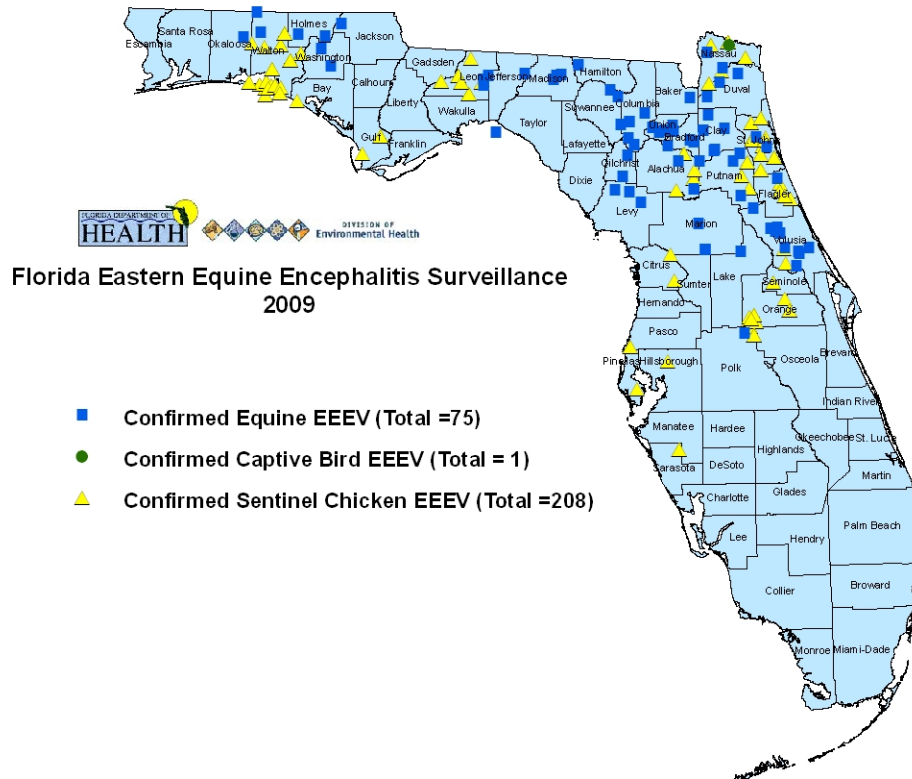
Marion: 2 horses (7/10, 9/11)
Nassau: 2 horses (7/23, 8/9), 1 captive bird (Cassowary 4/27); 15 sentinel chickens (6/1, 6/13, 6/29, 7/6, 7/27, 8/3, 8/10, 8/17, 8/24)
Okaloosa: 1 miniature donkey (8/3); 58 live wild birds (29 Blue jays 2/10, 2/23, 3/16, 3/18, 4/8, 4/20, 5/11, 5/19, 5/21, 5/26, 5/28, 6/8, 6/11, 7/13, 7/30, 8/3, 8/10, 8/18, 8/27, 8/31, 10/12, 11/9, 11/30; 2 Common grackles 3/18, 4/27; 15 Cardinals 3/18, 5/14, 6/22, 7/13, 7/27, 7/29, 8/5, 8/20, 8/31, 9/7, 10/19, 11/2, 11/23, 11/30; 4 Brown thrashers 4/16, 5/7, 5/26, 5/28; 2 House finches 5/28, 6/15; 4 Red-winged blackbirds 8/3, 9/3, 10/1; 1 Tufted titmouse 12/9)
Orange: 33 sentinel chickens (3/26, 5/11, 5/18, 5/26, 6/1, 6/8, 6/11, 6/22, 6/25, 6/29, 7/6, 7/9, 7/13, 7/16, 7/20, 7/27, 7/30, 8/3, 8/24, 9/3, 9/8, 11/5, 11/12, 11/19, 12/31)
Osceola: 1 horse (7/4)
Pasco: 2 sentinel chickens (3/9)
Pinellas: 1 sentinel chicken (11/6)
Putnam: 5 horses (6/16, 8/19, 11/7, 11/17, 12/23); 11 sentinel chickens (6/19, 6/26, 7/17, 7/24, 8/14, 9/11, 9/18, 9/25)
Santa Rosa: 42 live wild birds (4 House sparrows 1/6, 11/17, 11/25, 12/8; 3 Northern mockingbirds 4/28, 9/22; 15 Blue jays 5/12, 5/12, 5/13, 5/13, 5/19, 5/27, 6/1, 6/16, 7/14, 7/28, 8/4, 8/12, 10/6; 19 Cardinals 6/23, 7/14, 7/28, 8/3, 8/4, 8/19, 8/25, 9/9, 9/15, 9/29, 10/5, 10/6, 10/13, 10/14, 10/20, 12/1)
Sarasota: 2 sentinel chickens (6/19, 10/2)
Seminole: 2 sentinel chickens (8/25)
St. Johns: 2 horses (7/17, 7/27); 25 sentinel chickens (5/11, 6/15, 6/29, 7/6, 7/13, 7/20, 7/27, 8/3, 8/10, 9/14)
Suwannee: 2 horses (5/28, 6/4)
Union: 5 horses (6/1, 6/18, 7/4, 7/16, 8/14)
Volusia: 10 horses (1/3, 4/1, 4/6, 6/18, 6/20, 6/20, 7/19, 7/22, 7/26, 10/21); 2 sentinel chickens (7/6, 7/27)
Walton: 2 horses (7/24, 8/10); 68 sentinel chickens (1/12, 1/15, 1/26, 4/27, 5/11, 5/27, 6/1, 6/8, 6/9, 6/10, 6/15, 6/17, 6/21, 6/22, 6/26, 6/30, 7/7, 7/13, 8/4, 8/18, 9/1, 9/14, 9/22, 9/23, 9/23, 10/6, 10/21, 10/28, 11/2, 12/7); 3 mosquito pools (6/10, 6/18, 6/24); 15 live wild birds (14 Cardinals 5/28, 6/25, 7/16, 8/6, 8/13, 9/24, 9/29, 10/8, 10/15, 10/22, 11/5, 12/3; 1 Red-winged blackbird 10/8)
Washington: 2 horses (5/26, 6/21)

Highlands J virus surveillance

Positive samples from 112 sentinel chickens were received. To date, 11 of Florida's 67 counties have reported HJV activity.

Alachua: 9 sentinel chickens (7/7, 7/20, 8/5, 8/24, 9/1, 9/8, 11/9)
Brevard: 1 sentinel chicken (8/26)
Duval: 3 sentinel chickens (6/29, 7/7, 7/20)
Flagler: 2 sentinel chickens (8/24, 10/5)
Gulf: 3 sentinel chickens (6/29, 9/14)
Leon: 22 sentinel chickens (5/26, 6/1, 6/16, 6/22, 6/29, 7/13, 7/21, 8/4, 8/31, 9/8, 9/14, 9/21, 10/12, 9/28, 10/19, 11/16)
Nassau: 6 sentinel chickens (7/6, 7/20, 8/17, 9/21)
Orange: 11 sentinel chickens (6/22, 6/25, 6/29, 7/16, 8/5, 11/2, 11/16)
Putnam: 6 sentinel chickens (8/14, 8/18, 9/11, 9/18, 9/25, 9/25)
St. Johns: 10 sentinel chickens (4/20, 5/26, 6/8, 8/3, 8/17, 8/24, 8/31, 9/8, 9/14)
Walton: 39 sentinel chickens (2/17, 3/9, 4/9, 4/17, 5/16, 5/20, 6/1, 6/15, 6/17, 6/22, 6/29, 7/7, 7/8, 7/20, 8/5, 8/18, 8/31, 10/21, 12/7)

Figure 1. EEEV veterinary and sentinel surveillance, Florida, 2009



West Nile virus surveillance

Positive samples from 7 equines, 110 sentinel chickens, and 2 dead birds were received. Samples from 3 live wild birds tested positive for antibodies to an indeterminate flavivirus, either WNV or SLEV. To date, 23 out of Florida's 67 counties have reported flavivirus activity (one acquired out state).

Alachua: 1 horse (10/5); 4 sentinel chickens (9/8, 9/21, 10/13, 10/19)

Bay: 3 sentinel chickens (8/25, 9/1)

Charlotte: 2 sentinel chickens (11/16)

Citrus: 3 sentinel chickens (10/9, 10/23, 12/21)

Clay: 1 dead bird (1 Crow 10/24)

Duval: 1 horse (10/18); 12 sentinel chickens (6/1, 8/24, 9/12, 9/17, 9/28, 10/1, 10/5, 11/2, 11/9)

Gilchrist: 1 horse (9/8)

Gulf: 3 sentinel chickens (9/14, 10/5, 10/19)

Hillsborough: 15 sentinel chickens (9/8, 9/22, 10/21, 10/27, 10/28, 11/23, 12/1, 12/15, 12/29)

Lee: 3 sentinel chickens (11/23)

Leon: 11 sentinel chickens (8/31, 9/8, 9/14, 9/21, 9/28, 10/19, 10/26)

Marion: 1 horse (11/13); 1 dead bird (1 Crow 10/15)

Nassau: 1 horse (11/08); 8 sentinel chickens (8/17, 8/24, 8/31, 9/7, 9/14)

Okaloosa: 1 live wild bird (1 Blue jay 5/26, 1 Cardinal 10/21)

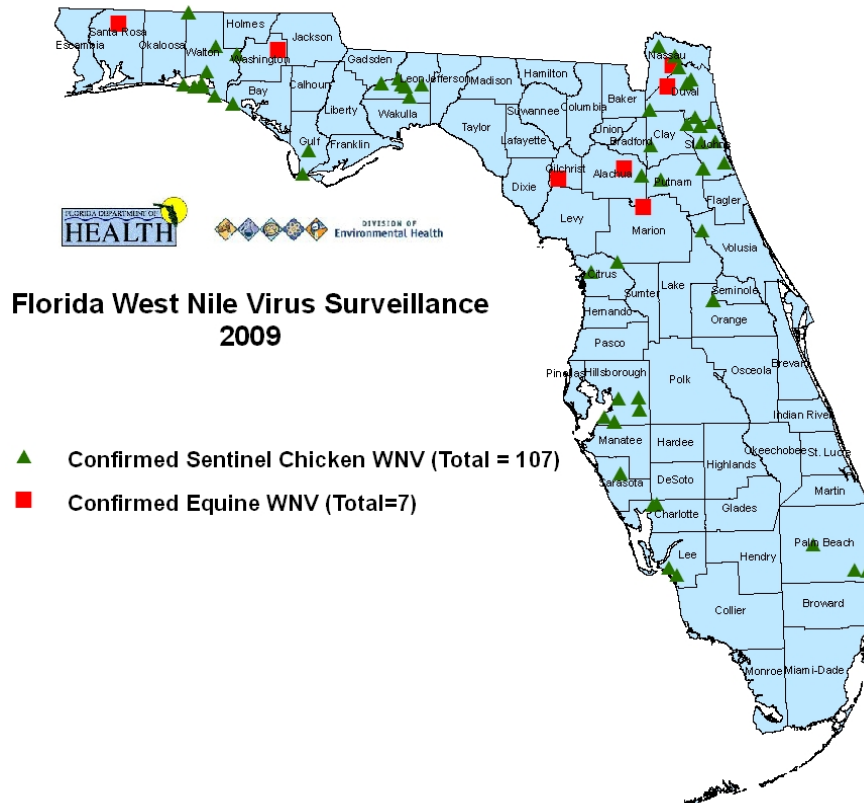
Palm Beach: 4 sentinel chickens (11/9, 11/23, 12/18)

Putnam: 4 sentinel chickens (9/11, 10/6, 10/8, 10/25)

Santa Rosa: 1 horse (8/17); 1 live wild bird (Blue jay 5/13)

Sarasota: 5 sentinel chickens (12/4, 12/18, 12/28)
 Seminole: 4 sentinel chickens (10/13, 10/20)
 St. Johns: 14 sentinel chickens (8/31, 9/8, 9/14, 9/21, 10/26, 11/2, 11/9, 11/16, 11/23, 12/7)
 Walton: 15 sentinel chickens (6/15, 7/20, 8/27, 10/26, 11/9, 11/16, 12/14)
 Washington: 1 horse (9/24)

Figure 2. WNV veterinary and sentinel surveillance, Florida 2009,



St. Louis Encephalitis virus surveillance

No activity in 2009.

Mosquito Surveillance

During 2009, three mosquito pools tested positive for EEEV in Walton County and two tested positive for DENV in Monroe County

Eastern Equine Encephalitis virus surveillance

Walton: 3 mosquito pools (*Cs. melanura*, 6/10, 6/18, *Ps. ferox*, 6/24)

Dengue virus surveillance

Monroe: 2 mosquito pools (*Ae. aegypti*, 10/16)

Bird Mortality Surveillance

During 2008, residents of 57 Florida counties reported dead birds to the website maintained by the Florida Fish and Wildlife Conservation Commission (www.myfwc.com/bird/). This resulted in 370 reports representing a total of 939 dead birds (82 crows, 40 jays, 58 raptors, 749 others) were received from 54 of Florida's 67 counties. In 2008, there were 550 reports representing a total of 1,296 dead birds (53 crows, 63 jays, 75 raptors, and 1,105 others).

Acknowledgements and data sources: county health departments, Department of Health Laboratories, Department of Agriculture and Consumer Services, mosquito control agencies, Florida Fish and Wildlife Conservation Commission, medical providers and veterinarians. Equine cases are determined by the Department of Agriculture and Consumer Services.

Wild captured bird information is provided by the Florida A&M University, John A. Mulrennan Sr., Public Health Entomology Research & Education Center. For more information, go to <http://www.pherec.org/DECS>, and click on "Arbovirus Ecology" to download the database, then the "Bird Serology" tab.

For more surveillance information, please see the DOH web site at:
<http://www.doh.state.fl.us/Environment/medicine/arboviral/index.htm>.