Arbovirus surveillance in Florida includes endemic mosquito-borne viruses West Nile virus (WNV), Eastern equine encephalitis virus (EEEV), St. Louis encephalitis virus (SLEV), and Highlands J virus (HJV) and exotic viruses such as Dengue virus (DENV) and California encephalitis group viruses (CEV). Malaria, a non-viral mosquito-borne disease is also included. During the period November 21-27, 2010, the following arboviral activity was recorded in Florida:

**DENV activity:** No new cases of dengue associated with Key West were reported this week. In 2010, there have been 60 locally-acquired cases in Key West, one in Broward County, and one in Miami-Dade County.

**EEEV activity:** One sentinel chicken in Walton County tested positive for antibodies to EEEV. In 2010, positive samples from five humans, 93 equines, 166 sentinel chickens, 41 live wild birds, and six mosquito pools have been received from 45 of Florida’s 67 counties.

**WNV activity:** One WNV confirmed positive horse was reported in Glades County. Twenty-four sentinel chickens in Alachua, Brevard, Citrus, Flagler, Hendry, Hillsborough, Martin, Orange, Palm Beach, Pinellas, Putnam, Seminole, St. Johns, and Volusia counties tested positive for antibodies to WNV. In 2010, positive samples from 12 humans, 23 equines, 1 reptile, 512 sentinel chickens, and two live wild birds (flavivirus positive) have been received from 39 counties.

**SLEV activity:** No SLEV activity was reported this week. In 2010, positive samples from five sentinel chickens have been received from one county.

**HJV activity:** Four sentinel chickens in Walton County tested positive for antibodies to HJV. In 2010, positive samples from 92 sentinel chickens have been received from 14 counties.

**Advisories/Alerts:** Brevard, Collier, Hillsborough, Monroe, and Orange counties are under mosquito-borne illness alerts. Broward, Clay, De Soto, Duval, Flagler, Glades, Hendry, Highlands, Indian River, Jackson, Jefferson, Lake, Leon, Madison, Marion, Martin, Miami-Dade, Osceola, Palm Beach, Polk, Putnam, St. Lucie, Volusia, Walton, Wakulla, and Washington counties are under mosquito-borne illness advisories.

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### Year to Date Human Case Summary

**Eastern Equine Encephalitis Acquired in Florida:** Four human cases of EEE have been reported in 2010 in Hillsborough (2), Wakulla, and Leon counties with onset dates in June and July (3). One incidental infection was reported in Hillsborough County.

**West Nile Virus Infection Acquired in Florida:** Eleven human cases of WNV have been reported in 2010 in Osceola, Orange (2), Collier (2), Broward, Duval, De Soto, Suwannee, Brevard, and Highlands counties with onset in July (2), August (4), September (3), and October (2). The Suwannee County case had travel outside the county, primarily in Florida. One positive asymptomatic blood donor was reported in Brevard County.
Dengue Acquired in Florida: In 2010, 62 cases of locally acquired dengue have been reported in Broward (1), Miami-Dade (1) and Monroe (60-Key West) counties. Of the Key West cases, 49 are Key West residents, eight are residents of other Florida counties, and one resides out of state. Onset dates ranged from March 17 to October 28, 2010.

Imported Dengue: One hundred and twenty-three cases of dengue with onset in 2010 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, Colombia (8), Costa Rica (4), Dominican Republic (13), Ecuador, El Salvador, Ghana, Grenada (4), Guatemala (2), Haiti (5), Honduras (6), Jamaica (5), Martinique (2), Mexico, Nicaragua (10), Pakistan, Philippines, Puerto Rico (35), Trinidad, Venezuela (15), Virgin Islands (3), Malaysia/Dubai/Bangladesh, and Panama/Venezuela (slash indicates travel to more than one country). Counties reporting cases were Alachua (2), Broward (20), Collier (2), Duval (3), Escambia, Flagler, Hendry, Hillsborough (7), Lake, Lee, Manatee, Marion, Miami-Dade (45), Monroe, Orange (9), Osceola (5), Palm Beach (10), Pasco, Pinellas, Polk (2), Seminole (3), St. Lucie (2), and Volusia (3).

Imported Malaria: One hundred and eleven imported cases of malaria with onset in 2010 have been reported. Countries of origin were: Angola, Cameroon, Dominican Republic, Eritrea, Ghana (4), Guyana, Haiti (64), Honduras (4), India (8), Indonesia, Ivory Coast, Kenya, Malawi (2), Nigeria (7), Pakistan (2), Peru, Philippines, Sierra Leone, South Africa, Togo, Uganda, West Africa (2), Zambia/South Africa, Africa, and unknown (2). Counties reporting cases were: Alachua, Brevard (2), Broward (18), Charlotte, Citrus, Collier (4), Duval (5), Escambia (3), Hillsborough (5), Lake, Lee, Leon, Miami-Dade (25), Manatee (2), Orange (15), Osceola (3), Palm Beach (13), Pasco, Pinellas, Polk (2), Sarasota, Seminole, St. Lucie, Volusia (2), and Wakulla.

Veterinary Cases

One horse in Glades County tested positive for WNV this week. In 2010, 23 WNV positive horses, one WNV positive reptile, and 93 EEEV positive horses have been reported.

<table>
<thead>
<tr>
<th>County</th>
<th>Onset Date</th>
<th>Species</th>
<th>Virus</th>
<th>Status</th>
<th>County YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glades</td>
<td>10/25/10</td>
<td>Equine</td>
<td>WNV</td>
<td>Alive</td>
<td>1 WNV, 3 EEE</td>
</tr>
</tbody>
</table>
Sentinel Chickens

There was one seroconversion to EEEV in a sentinel chicken from Walton County, 24 to WNV in Alachua, Brevard, Citrus, Flagler, Hendry, Hillsborough, Martin, Orange, Palm Beach, Pinellas, Putnam, Seminole, St. Johns, and Volusia counties, and four to HJV in Walton County. Seroconversion rates are calculated by week and include previously reported results.

<table>
<thead>
<tr>
<th>County</th>
<th>Collection Date</th>
<th>Seroconversion Rates (%)</th>
<th>County Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SLEV</td>
<td>WNV</td>
</tr>
<tr>
<td>Alachua</td>
<td>11/08/10</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Brevard</td>
<td>10/27/10</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11/10</td>
<td></td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>11/12/10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrus</td>
<td>11/15/10</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Flagler</td>
<td>11/01/10</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>Hendry</td>
<td>10/13/10</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Hillsborough</td>
<td>11/02/10</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11/16/10</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Martin</td>
<td>10/29/10</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>10/28/10</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Palm Beach</td>
<td>11/01/10</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Pinellas</td>
<td>11/15/10</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Putnam</td>
<td>10/22/10</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>Seminole</td>
<td>10/26, 10/28/10</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>St. Johns</td>
<td>11/01/10</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11/08/10</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Volusia</td>
<td>11/15/10</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>Walton (North)</td>
<td>11/04/10</td>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td>Walton (South)</td>
<td>11/08/10</td>
<td>1.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>
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, four reports representing 10 dead birds were received from three counties. One was identified as a raptor; none were identified as crows or jays. In 2010, 327 reports representing a total of 1062 dead birds (49 crows, 16 jays, 51 raptors, 845 others) have been reported from 48 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/
### YTD Arbovirus Activity by County

<table>
<thead>
<tr>
<th>County</th>
<th>Arbovirus Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachua</td>
<td>WNV: 12 sentinels (8/2, 8/16, 9/7, 9/13, 9/20, 9/27, 10/18, 11/8)</td>
</tr>
<tr>
<td></td>
<td>EEE: 1 horse (7/21); 4 sentinels (7/16, 7/19, 8/2, 9/28)</td>
</tr>
<tr>
<td></td>
<td>HJV: 1 sentinel (9/20)</td>
</tr>
<tr>
<td>Baker</td>
<td>EEE: 1 horse (7/26)</td>
</tr>
<tr>
<td>Bradford</td>
<td>WNV: 1 horse (10/06)</td>
</tr>
<tr>
<td></td>
<td>EEE: 1 horse (6/16)</td>
</tr>
<tr>
<td>Brevard</td>
<td>WNV: 2 humans (1 case in October, 1 positive blood donor); 52 sentinels (7/7,</td>
</tr>
<tr>
<td></td>
<td>7/21, 8/4, 8/11, 8/18, 8/20, 9/1, 9/3, 9/8, 9/17, 9/22, 9/23, 9/24, 10/1, 10/6,</td>
</tr>
<tr>
<td></td>
<td>10/7, 10/8, 10/18, 10/20, 10/27, 11/10, 11/12)</td>
</tr>
<tr>
<td></td>
<td>EEE: 1 sentinel (6/2)</td>
</tr>
<tr>
<td>Broward</td>
<td>DENV: 3 humans (1 acquired in Broward, 2 acquired in Key West)</td>
</tr>
<tr>
<td></td>
<td>WNV: 1 human (August)</td>
</tr>
<tr>
<td>Charlotte</td>
<td>WNV: 3 sentinels (8/27, 9/10, 10/8)</td>
</tr>
<tr>
<td>Citrus</td>
<td>WNV: 1 horse (10/3); 12 sentinels (9/20, 9/27, 10/4, 10/11, 10/18, 10/25, 11/15)</td>
</tr>
<tr>
<td></td>
<td>EEE: 5 sentinels (5/24, 6/7, 6/28, 7/12, 7/19)</td>
</tr>
<tr>
<td></td>
<td>HJV: 3 sentinels (5/17, 5/24, 8/9)</td>
</tr>
<tr>
<td>Clay</td>
<td>EEE: 1 horse (6/16)</td>
</tr>
<tr>
<td>Collier</td>
<td>WNV: 2 humans (August)</td>
</tr>
<tr>
<td></td>
<td>EEE: 4 horses (6/9, 6/22, 6/29, 7/9)</td>
</tr>
<tr>
<td>De Soto</td>
<td>WNV: 1 human (September); 3 horses (9/6, 9/10, 9/21)</td>
</tr>
<tr>
<td></td>
<td>EEE: 1 horse (8/23)</td>
</tr>
<tr>
<td>Duval</td>
<td>WNV: 1 human (September); 5 sentinels (9/13, 9/27, 10/11, 10/18)</td>
</tr>
<tr>
<td></td>
<td>EEE: 1 horse (8/18); 5 sentinels (6/21, 7/8, 7/21)</td>
</tr>
<tr>
<td>Escambia</td>
<td>EEE: 1 horse (8/16)</td>
</tr>
<tr>
<td>Flagler</td>
<td>WNV: 9 sentinels (9/13, 9/27, 10/4, 10/18, 10/25, 11/1)</td>
</tr>
<tr>
<td></td>
<td>EEE: 19 sentinels (3/22, 4/26, 5/3, 6/7, 6/21, 7/12, 7/19, 7/26, 8/2, 8/9, 9/27,</td>
</tr>
<tr>
<td></td>
<td>10/4); 3 mosquito pools (Culiseta melanura 4/27, 5/11, 6/15)</td>
</tr>
<tr>
<td></td>
<td>HJV: 5 sentinels (6/14, 6/28, 8/16, 9/20, 10/18)</td>
</tr>
<tr>
<td>Glades</td>
<td>WNV: 1 alligator (10/1), 1 horse (10/25)</td>
</tr>
</tbody>
</table>
EEE : 3 horses (6/20, 6/24, 7/26)

Gulf
EEE : 1 horse (9/5)

Hardee
EEE : 1 horse (8/22)

Hendry
WNV : 1 horse (9/15) ; 12 sentinels (8/18, 8/31, 9/13, 10/13)
EEE : 1 horse (7/21)

Hernando
WNV : 3 sentinels (9/27, 10/12)

Highlands
WNV : 1 human (October)

Hillsborough
WNV : 1 horse (9/15) ; 12 sentinels (8/18, 8/31, 9/13, 10/13)
EEE : 1 horse (7/21)

Hernando
WNV : 3 sentinels (9/27, 10/12)

Hillsborough
WNV : 1 human (October)

Holmes
EEE : 2 horses (7/23, 8/9)

Indian River
WNV : 47 sentinels (7/22, 8/12, 8/19, 9/2, 9/9, 9/16, 9/23, 9/29, 9/30, 10/7, 10/14, 10/21, 10/26)
HJV : 1 sentinel (10/14)

Jackson
EEE : 4 horses (6/14, 6/28, 7/10, 8/1)

Jefferson
WNV : 1 horse (7/4)
EEE : 3 horses (7/20, 8/1, 8/25)

Lake
EEE : 6 horses (5/20, 6/29, 7/4, 7/9, 7/15, 7/17)

Lee
WNV : 53 sentinels (3/30, 4/20, 8/2, 9/8, 15, 8/24, 8/30, 9/7, 9/13, 9/14, 9/20, 9/27, 9/28, 10/4, 10/11)

Leon
DENV : 2 humans (acquired in Key West)
WNV : 6 sentinels (9/20, 9/28, 10/25)
EEE : 1 human (July); 2 horses (6/29, 8/5); 11 sentinels (6/1, 6/21, 8/2, 8/9, 8/16, 9/7, 9/20, 10/18, 11/1)
HJV : 4 sentinels (8/16, 8/23, 10/4, 10/11)

Liberty
EEE : 1 horse (7/11)

Madison
EEE : 2 horses (6/21, 7/3)

Manatee
WNV : 16 sentinels (8/30, 9/7, 9/13, 9/20, 9/27, 10/4, 10/11, 10/18, 10/25)
EEE : 1 horse (7/21)

Marion
WNV : 1 horse (10/1)
EEE : 6 horses (5/7, 7/22, 8/3, 9/24, 10/11)

Martin
WNV : 2 horses (9/11, 9/16); 14 sentinels (8/13, 8/27, 9/10, 9/16, 9/23, 10/1, 10/15, 10/29)
EEE : 1 horse (8/4); 2 sentinels (5/28)

Miami-Dade
DENV : 2 humans (acquired in Miami-Dade, 1 acquired in Key West)
SLEV : 5 sentinels (8/23, 9/7, 9/20, 9/27)
WNV : 1 sentinel (10/25)
EEE : 4 horses (6/7, 6/17, 7/4); 2 sentinels (6/14)

Monroe
DENV : 60 humans (acquired in Key West)

Nassau
WNV : 5 sentinels (9/6, 9/20)
EEE : 6 sentinels (6/28, 7/13, 7/19, 8/9, 8/16, 8/31)
HJV : 9 sentinels (6/28, 7/13, 7/19, 7/26, 8/16, 8/23, 9/20)

Okaloosa
WNV : 2 live wild birds (flavivirus positive, 2 blue jays 6/14, 11/1)
EEE : 1 horse (7/25); 16 live wild birds (1 house sparrow 1/4, 11 blue jays 1/27, 4/19, 4/21, 4/26, 7/5, 7/26, 9/16, 11/1, 11/3, 3 cardinals 7/5, 7/22, 8/5; 1 northern mockingbird 10/4)

Okeechobee
EEE : 4 horses (6/14, 7/1, 7/7, 7/17)

Orange
WNV : 2 humans (1 July, 1 August); 42 sentinels (6/14, 7/6, 7/19, 7/26, 8/2, 8/16, 8/23, 8/30, 9/2, 9/7, 9/16, 9/23, 9/27, 10/4, 10/11, 10/14, 10/18, 10/21, 10/28)
EEE : 1 horse (7/16); 23 sentinels (1/7, 5/3, 5/17, 6/7, 6/10, 6/14, 6/21, 7/6, 7/12, 7/19, 7/22, 7/29, 9/7, 9/13)
HJV : 23 sentinels (5/17, 6/7, 6/10, 6/14, 6/24, 7/6, 7/8, 7/15, 7/19, 7/22, 8/5, 8/16, 8/19, 10/11)

Osceola
WNV : 1 human (July); 6 horses (7/14, 7/15, 7/20, 7/24, 7/26, 8/30)
EEE : 7 horses (5/15 (donkey), 6/8, 6/10, 6/13, 7/9)

Palm Beach
WNV : 2 horses (9/9, 9/21); 55 sentinels (3/15, 8/2, 8/9, 8/17, 8/23, 8/30, 9/7, 9/13, 9/17, 9/20, 9/27, 10/4, 10/11, 10/18, 10/25, 11/1)
EEE : 2 horses (6/22, 8/31)

Pasco
EEE : 3 horses (6/11, 7/16, 8/7); 3 sentinels (7/6, 7/12)
HJV : 3 sentinels (6/28, 7/6, 8/16)

Pinellas
DENV : 1 human (acquired in Key West)
WNV : 2 sentinels (9/27, 11/15)
EEE : 3 sentinels (5/24, 7/19)
HJV : 2 sentinels (4/26, 7/6)

Polk
WNV : 2 horses (9/1, 9/10)
EEE : 4 horses (4/28, 6/25, 6/28, 8/19)

Putnam
WNV : 13 sentinels (8/27, 9/9, 9/17, 9/24, 10/1, 10/22)
EEE : 2 horses (7/26, 8/8); 7 sentinels (6/4, 7/23, 7/30, 8/6, 9/9, 9/24)
HJV: 4 sentinels (5/14, 8/6, 10/1)
St. Johns WNV: 26 sentinels (8/16, 8/23, 8/30, 9/7, 9/13, 9/20, 9/27, 10/18, 11/1, 11/8)
EEE: 1 horse (6/18); 3 sentinels (6/1, 7/12, 7/26)
HJV: 3 sentinels (4/26, 5/3, 7/12)
St. Lucie WNV: 8 sentinels (9/10, 9/17, 9/24, 10/1, 10/8)
Santa Rosa EEE: 1 horse (6/29); 18 live wild birds (11 blue jays 2/2, 3/22, 4/13, 4/19, 5/11, 5/18, 7/13, 8/31, 9/14, 6 cardinals 6/22, 7/13, 7/27, 8/3, 8/31, 11/2, 1 red-winged blackbird 10/26)
Sarasota DENV: 2 humans (acquired in Key West)
WNV: 5 sentinels (1/8, 10/8, 10/15, 10/25, 11/1)
EEE: 3 sentinels (1/5, 1/11, 6/1)
Seminole WNV: 9 sentinels (9/2, 9/16, 9/23, 10/7, 10/14, 10/26, 10/28)
EEE: 3 horses (6/26, 7/15, 8/14) ; 1 sentinel (7/2)
HJV: 1 sentinel (7/27)
Suwannee WNV: 1 human (September)
Union WNV: 1 horse (10/13)
Volusia WNV: 20 sentinels (7/19, 8/9, 8/16, 8/30, 9/7, 9/13, 9/20, 9/27, 10/4, 10/11, 11/15)
EEE: 2 horses (5/7, 7/1) ; 16 sentinels (5/24, 6/1, 6/7, 6/14, 6/21, 6/28, 7/6, 7/12, 7/26, 8/9) ; 3 mosquito pools (Culiseta melanura 6/15, 6/22, 6/29)
HJV: 4 sentinels (5/17, 7/12, 9/7, 10/4)
Wakulla EEE: 1 human (July)
Walton WNV: 54 sentinels (1/14, 2/4, 3/8, 3/12, 3/22, 4/7, 4/8, 4/23, 4/30, 5/5, 5/20, 6/7, 6/11, 7/8, 7/9, 7/22, 7/30, 8/12, 8/19, 8/20, 9/2, 10/12)
EEE: 1 horse (8/5) ; 50 sentinels (1/19, 3/22, 5/3, 6/8, 6/21, 7/6, 6/28, 6/30, 7/6, 7/12, 7/15, 7/18, 7/19, 7/20, 7/26, 7/28, 8/2, 8/3, 8/9, 8/23, 8/27, 9/7, 10/4, 10/18, 11/1, 11/8) ; 8 live wild birds (7 cardinals 6/24, 7/16, 7/22, 10/29, 1 blue jay 6/24)
Washington EEE: 7 horses (6/17, 6/22, 6/25, 6/28, 7/4, 7/16, 7/20)

Acknowledgements and Data Sources

Contributors: Elizabeth Radke, MPH, Danielle Stanek, DVM, and Carina Blackmore, DVM, PhD, DOH Bureau of Environmental Public Health Medicine; Lillian Stark, PhD and Valerie Mock, DOH Bureau of Laboratories.

For more surveillance information, please see the DOH website at: http://www.doh.state.fl.us/Environment/medicine/arboviral/index.html

Data is provided by 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 John A. Mulrennan Public Health Entomology Research and Education Center.