

Florida 2006 Arbovirus Activity by County

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During 2006, 20 of Florida's 67 counties reported confirmed West Nile virus (WNV) activity and 22 counties reported confirmed Eastern Equine Encephalitis virus (EEEV) activity. In comparison, 50 counties reported confirmed EEEV activity and 35 counties reported confirmed WNV activity during 2005. Eight counties reported confirmed St. Louis Encephalitis virus (SLEV) virus activity in 2006, compared to 4 in 2005. Six counties reported Highlands J virus activity in 2006, compared to 16 in 2005.

No locally-acquired human cases were reported in 2006. However, three Florida residents were infected with WNV while traveling to other states, and one resident was infected with LaCrosse Encephalitis virus (LACV) while visiting another state. In 2005, 21 locally-acquired cases of WNV and 5 cases of locally-acquired EEEV were confirmed in Florida residents. No mosquito-borne illness advisories or alerts were issued in Florida during 2006.

1. Human Surveillance

Eastern Equine Encephalitis virus (ICD9 Code 6220)

No human cases of EEEV infection were reported.

West Nile virus (ICD9 Codes 6630 and 6631)

No locally-acquired cases of WNV infection were confirmed in Florida residents this year. However, two residents of Escambia County became infected with WNV while traveling to Mississippi and Louisiana. A resident of Palm Beach County became infected with WNV while traveling to Missouri. These are reported as Florida cases acquired out-of-state.

St. Louis Encephalitis virus (ICD9 Code 6230)

No human cases of SLEV infection were reported in 2006.

LaCrosse virus (ICD9 Code 6250)

A Hillsborough County resident with travel history to North Carolina was confirmed with a LaCrosse encephalitis infection in August. LaCrosse virus is a member of the California Encephalitis group of viruses.

Dengue virus (ICD9 Code 6100)

In 2006, imported cases of dengue fever were reported in residents who had traveled to dengue-endemic countries. Of these, three were confirmed and the remaining cases were probable. Dengue cases were reported in residents of Alachua (2), Broward (3), Citrus (1), Marion (2), Miami-Dade (5), Orange (1), Palm Beach (3) and Pinellas (4) counties.

Please refer to Table 1 for a summary of human activity from 2001-2006.

Comparison to Past Years:

Table 1. Human arbovirus activity, Florida, 2001-2006

Human Cases	2006	2005	2004	2003	2002	2001
WNV	0	21 (4)*	42 (7)	94 (29)	35 (17)	11 (8)
EEEV	0	5 (5)	0	3 (3)	1	3 (3)
SLEV	0	0	0	0	1	0
DENV	21 (8)	18 (8)	12 (10)	15 (8)	21 (6)	21 (5)

*Number of affected

counties in parentheses

2. Animal Surveillance

Eastern Equine Encephalitis Virus

Positive samples from 120 live wild birds in 5 counties, 75 sentinel chickens in 13 counties, and 17 horses in 12 counties were received. Twenty-two of Florida's 67 counties reported EEEV activity in 2006. In 2005, 49 of Florida's 67 counties reported EEEV activity in animals (plus one county, Monroe, reported only mosquito EEEV activity). Date of disease onset (horses), date of death (birds), and date of first known antibody positive bleed (sentinels, live wild birds) is shown in parentheses.

Table 2. Eastern Equine Encephalitis virus activity, Florida, 2006

Eastern Equine Encephalitis Virus						
COUNTIES	Humans	Dead Birds	Sentinels	Horses	Live Wild Birds	Mosquito Pools
ALACHUA			15	1		
BAKER						
BAY						
BRADFORD						
BREVARD						
BROWARD						
CALHOUN						
CHARLOTTE						
CITRUS						
CLAY						
COLLIER						
COLUMBIA				1		
DESOTO						
DIXIE						
DUVAL			3	1		
ESCAMBIA			2	1		
FLAGLER			2			
FRANKLIN						
GADSDEN						
GILCHRIST						

GLADES				1		
GULF						
HAMILTON						
HARDEE						
HENDRY						
HERNANDO						
HIGHLANDS						
HILLSBOROUGH						
HOLMES						
INDIAN RIVER						
JACKSON						
JEFFERSON			5	1		
LAFAYETTE						
LAKE				2		
LEE						
LEON			1			
LEVY				2		
LIBERTY						
MADISON			4	2		
MANATEE						
MARION				3		
MARTIN						
MIAMI/DADE						
MONROE						
NASSAU			8			
OKALOOSA					57	
OKEECHOBEE						
ORANGE			8			
OSCEOLA			2			
PALM BEACH						
PASCO						
PINELLAS						
POLK				1		
PUTNAM						
SANTA ROSA				1	33	
SARASOTA						
SEMINOLE						
ST. JOHNS			1			
ST. LUCIE						
SUMTER						
SUWANNEE						
TAYLOR						
UNION						
VOLUSIA			4		1	
WAKULLA						
WALTON			20		14	
WASHINGTON					15	
TOTALS	0	0	75	17	120	0

Alachua: 15 sentinel chickens (6/26 x2, 7/11, 7/25 x5, 7/31, 9/11 x3, 9/25 x2, 10/10), 1 horse (7/31)

Columbia: 1 horse (3/3)

Duval: 1 horse (1/30), 3 sentinel chickens (10/27, 11/6 x2)

Escambia: 1 horse (9/15), 2 sentinel chickens (10/24 x2)

Flagler: 2 sentinel chickens (6/05, 6/19)

Glades: 1 horse (3/27)

Jefferson: 1 horse (7/08), 5 sentinel chickens (8/12, 8/18 x3, 9/16)

Lake: 2 horses (6/10, 8/24)

Leon: 1 sentinel chicken (8/02)

Levy: 2 horses (3/20, 3/27)

Madison: 2 horses (6/08, 8/08); 4 sentinel chickens (9/02, 9/16 x3)

Marion: 3 horses (2/01, 5/18, 7/07)

Nassau: 8 sentinel chickens (6/25, 7/9, 7/10, 7/23, 7/31, 8/28 x2, 9/18)

Okaloosa: 57 live wild birds (**36 Blue Jays** 1/12, 1/19 x2, 1/25, 3/15, 3/22, 3/27, 4/5, 4/6 x2 (one also positive for antibodies to flavivirus), 4/12, 4/20, 4/26 x2, 5/10, 5/29, 6/01, 6/06, 6/08x3, 6/20, 6/21, 6/28, 7/03, 7/13, 8/02, 8/9 x2 (one also reactive to flavivirus), 8/17 (also reactive to flavivirus), 9/13, 10/5, 10/10, 10/24, 11/9 (also reactive to flavivirus), 11/13; **5 Sparrows** 1/11, 2/8 x2, 2/9, 2/20; **11 Cardinals** 2/8, 2/17, 3/8, 4/19, 5/18, 6/15, 7/03, 7/19, 11/8, 11/20, 12/13; **2 Common Grackles** 4/27, 6/07; **1 Brown Thrasher** 3/23; **1 Red-Winged Blackbird** 6/22; **1 Tufted Titmouse** 9/21)

Orange: 8 sentinel chickens (2/20, 7/10, 7/14, 7/17, 7/21 x2, 7/27, 7/31)

Osceola: 2 sentinel chickens (2/23, 12/29)

Polk: 1 horse (6/12)

Santa Rosa: 33 live wild birds (**5 Cardinals** 1/10, 2/13, 4/25, 9/26, 10/31; **1 Northern Mockingbird** 3/21; **1 Common Grackle** 4/11; **24 Blue Jays** 4/11, 4/18, 4/25 x2 (one also reactive to flavivirus), 5/2, 5/9 x2 (one also reactive to flavivirus), 5/16, 5/23, 6/13 x3, 6/20 x2, 6/28, 7/11, 7/25, 8/02, 8/16, 10/24, 11/22 x2, 12/13 x2; **2 Brown Thrashers** 4/18, 5/31), 1 horse (6/22)

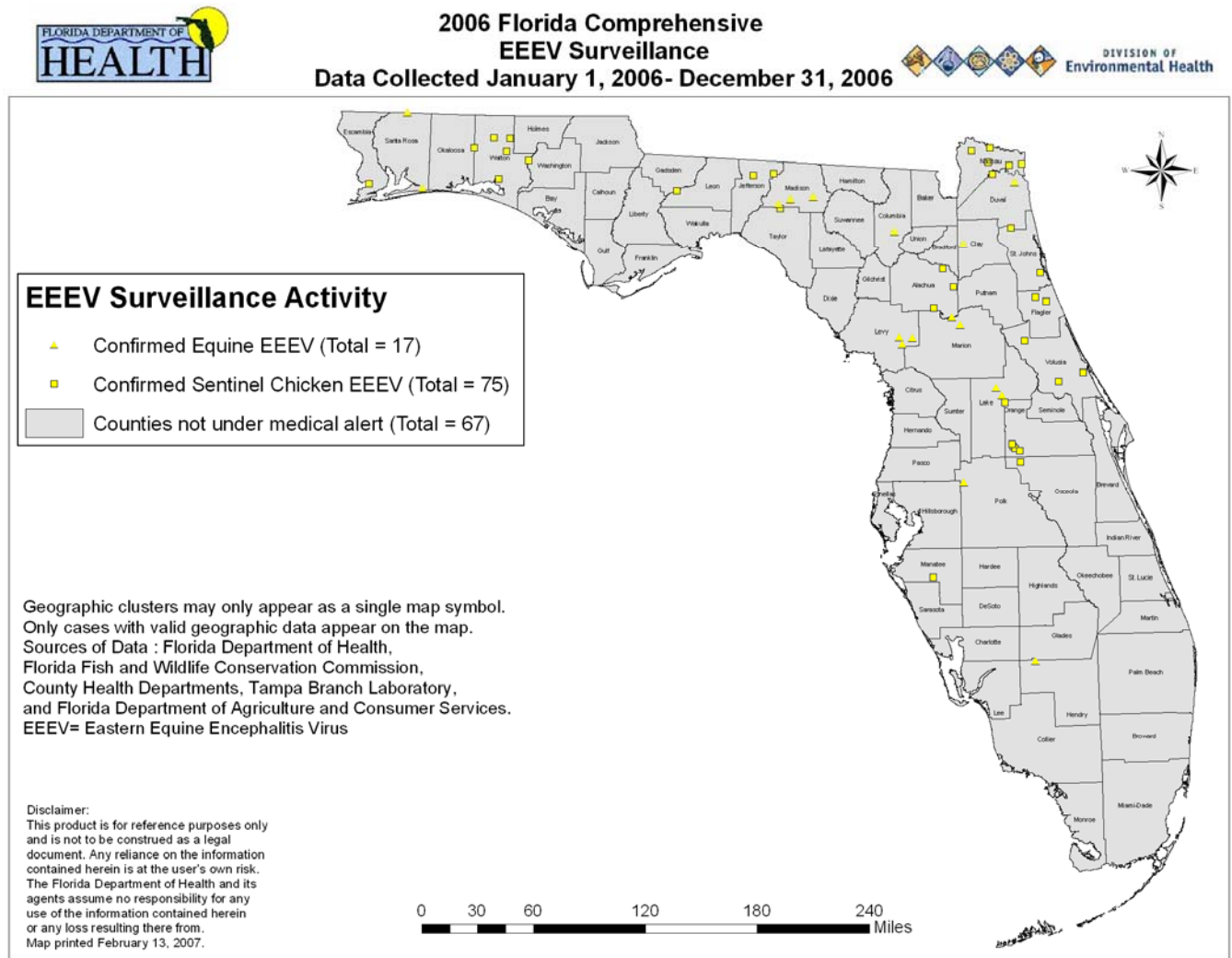
St. Johns: 1 sentinel chicken (4/10)

Volusia: 4 sentinel chickens (1/09, 3/20 x3), 1 live wild bird (**1 Red-Shouldered Hawk** 11/09)

Walton: 20 sentinel chickens (1/03, 1/05 x2, 1/18 x2, 2/01 x4, 2/6 x2, 2/9, 2/10 x2, 2/16, 2/17, 3/03, 3/13, 12/20 x2), 14 live wild birds (**6 Cardinals** 2/23, 3/16, 8/31, 9/21, 10/05, 11/02; **8 Sparrows** 3/16, 3/24 x2, 3/30, 8/24, 9/07 *flavi co-infection*, 10/05, 10/12)

Washington: 15 live wild birds (**2 Sparrows** 4/13, 8/04 (*flavi co-infection*); **9 Cardinals** 2/19, 3/16, 3/24, 4/13, 6/08, 8/24, 9/14, 11/16, 11/23; **2 Red-Winged Blackbirds** 2/19 x2; **2 Blue Jays** 3/24 x2)

Figure 1. Comprehensive EEEV Surveillance, Florida, 2006



Highlands J Virus

Highlands J virus (HJV) is a close relative to EEEV but is not as pathogenic in humans or as virulent in animals. Positive samples from 7 sentinel chickens in 6 counties were received in 2006. Sixteen counties reported HJV activity in 2005. Date of first known antibody positive bleed (sentinels) is shown in parentheses.

- Alachua: 1 sentinel chicken (10/10)
- Flagler: 1 sentinel chicken (9/11)
- Madison: 1 sentinel chicken (8/12)
- Nassau: 1 sentinel chicken (9/11)
- Volusia: 1 sentinel chicken (1/17)
- Walton: 2 sentinel chickens (1/6, 12/20)

California Serogroup viruses

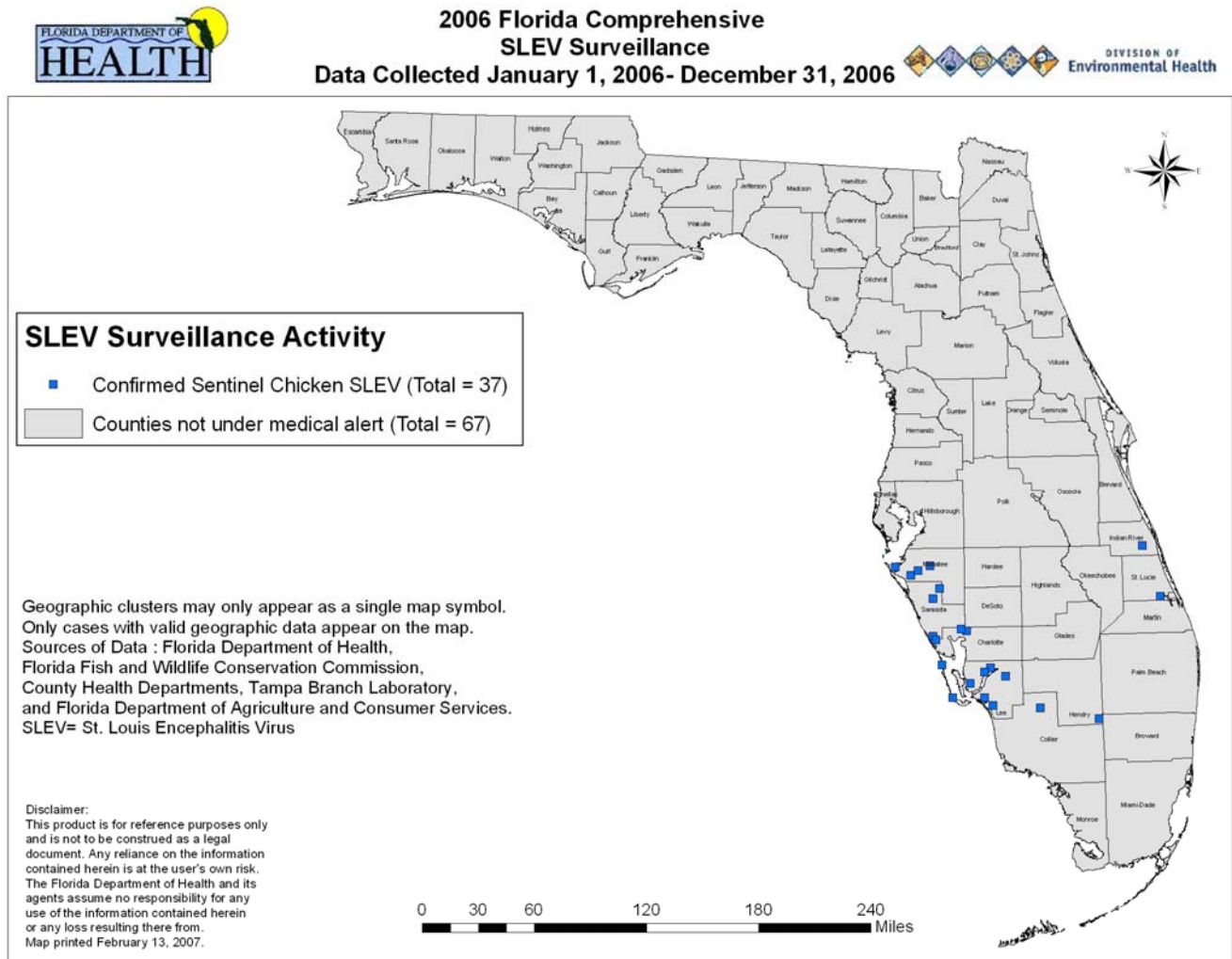
A positive sample from 1 dead bird (red-shouldered hawk 6/12) was received from Gilchrist County. Date of death is shown in parentheses.

St. Louis Encephalitis Virus

Positive samples from **37 sentinel chickens in 8 counties** were received in 2006. Many of the live wild birds reported under the West Nile virus heading, below, tested positive to indeterminate flavivirus, so it is not clear whether they were reactive to antibody to SLEV or WNV. During 2005, four counties reported SLEV activity. Date of first known antibody positive bleed (**sentinels**) is shown in parentheses.

- Charlotte: 4 sentinel chickens (8/25, 10/06, 11/03 x2)
- Collier: 1 sentinel chicken (9/18)
- Hendry: 4 sentinel chickens (10/13, 10/20 x2, 11/03)
- Indian River: 1 sentinel chicken (9/14)
- Lee: 14 sentinel chickens (8/15, 8/21 x2, 10/10 x3, 10/24 x3, 10/31 x2, 11/07, 11/20, 12/12)
- Manatee: 5 sentinel chickens (12/27 x5)
- Sarasota: 7 sentinel chickens (8/28, 9/25, 10/03, 10/09, 10/16, 10/23, 12/4)
- St. Lucie: 1 sentinel chicken (10/26)

Figure 2. Comprehensive St. Louis Encephalitis Virus Surveillance, Florida, 2006



West Nile Virus

Positive samples from 40 live wild birds in 7 counties (16 of which were reactive to indeterminate flavivirus antibodies) and 30 sentinel chickens in 16 counties were received. Twenty of Florida's 67 counties reported WNV (or indeterminate flavivirus) virus activity. Many of the live wild birds tested positive to antibodies to indeterminate flavivirus (could be SLEV or WNV). In 2005, 35 of Florida's 67 counties reported WNV (or indeterminate flavivirus) activity. Date of disease onset (horses), date of death (birds), and date of first known antibody positive bleed (sentinels, live wild birds) is shown in parentheses.

Table 3. West Nile virus activity, Florida, 2006

West Nile Virus						
COUNTIES	Human	Dead Birds	Sentinels	Horses/ Others	Live Wild Birds	Mosquito Pools
ALACHUA						
BAKER						
BAY			1			
BRADFORD						
BREVARD						
BROWARD						
CALHOUN						
CHARLOTTE						
CITRUS						
CLAY						
COLLIER						
COLUMBIA						
DESOTO						
DIXIE						
DUVAL			2		1	
ESCAMBIA						
FLAGLER						
FRANKLIN						
GADSDEN						
GILCHRIST						
GLADES						
GULF						
HAMILTON						
HARDEE						
HENDRY						
HERNANDO						
HIGHLANDS						
HILLSBOROUGH			4		1	
HOLMES						
INDIAN RIVER			1			
JACKSON			3			
JEFFERSON						

LAFAYETTE						
LAKE						
LEE			1			
LEON						
LEVY						
LIBERTY						
MADISON						
MANATEE			1			
MARION						
MARTIN						
MIAMI/DADE						
MONROE						
NASSAU			2			
OKALOOSA					5	
OKEECHOBEE						
ORANGE			2			
OSCEOLA			1			
PALM BEACH						
PASCO			1			
PINELLAS					1	
POLK						
PUTNAM			1			
SANTA ROSA					10	
SARASOTA			1			
SEMINOLE						
ST. JOHNS			1			
ST. LUCIE						
SUMTER						
SUWANNEE						
TAYLOR						
UNION						
VOLUSIA			1			
WAKULLA						
WALTON			7		14	
WASHINGTON					8	
TOTALS	0	0	30	0	40	0

Bay: 1 sentinel chicken (11/16)

Duval: 1 live wild bird (1 **Honduran Boat-Billed Heron** 7/27); 2 sentinel chickens (9/11, 9/25)

Hillsborough: 4 sentinel chickens (2/21, 2/28, 11/14 x2); 1 live wild bird (1 **Egyptian Goose** 8/30)

Indian River: 1 sentinel chicken (8/17)

Jackson: 3 sentinel chickens (6/07, 9/18, 10/2)

Lee: 1 sentinel chicken (8/21)

Manatee: 1 sentinel chicken (4/10)

Nassau: 2 sentinel chickens (9/25 x2)

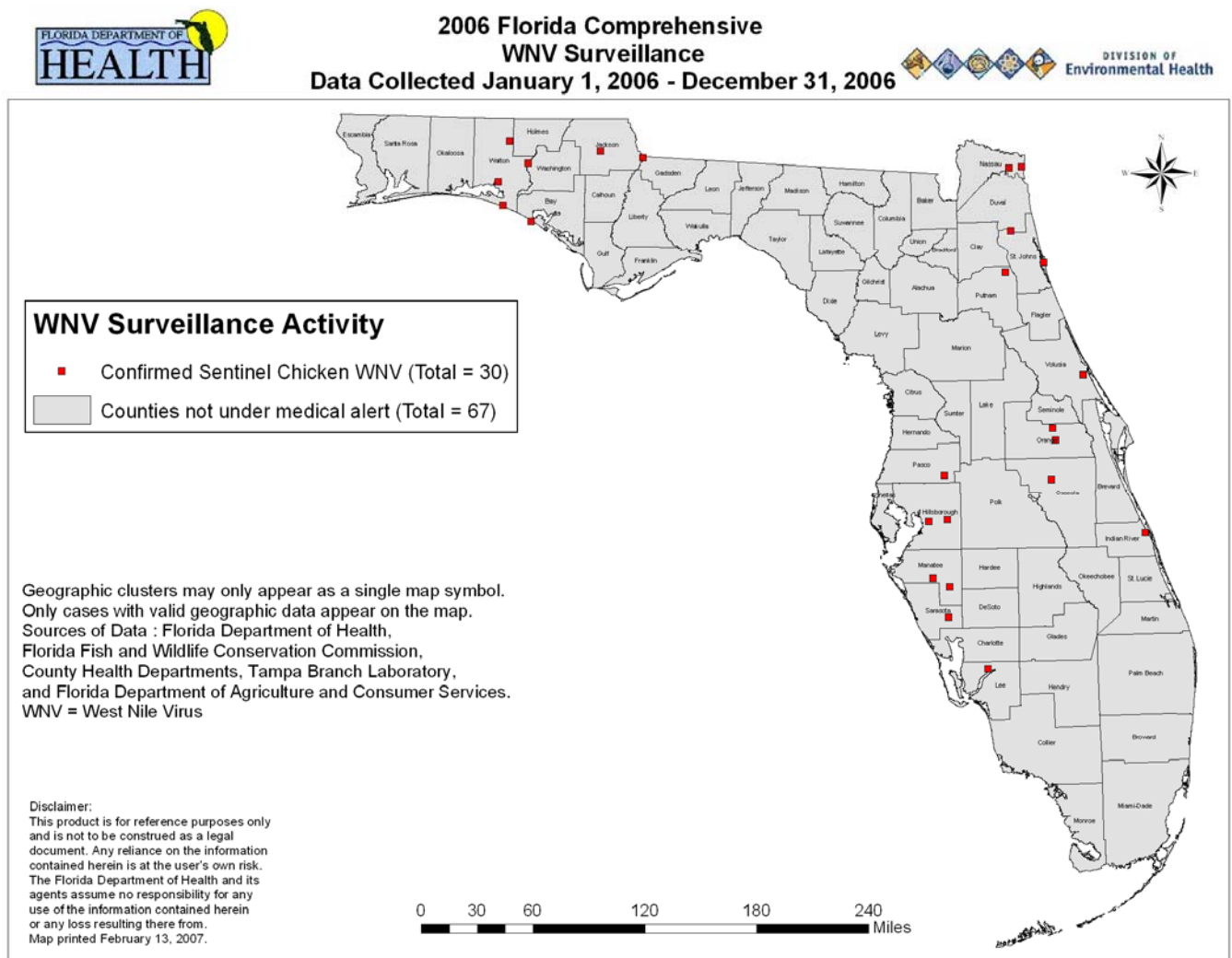
Okaloosa: 5 live wild birds (4 **Blue Jays** 4/6 (also *EEE+*), 8/9 (also *EEE+*), 8/17 (also *EEE+*), 11/9 (also *EEE+*), 1 **House Sparrow** 12/14)

Orange: 2 sentinel chickens (9/18, 10/2)

Osceola: 1 sentinel chicken (7/5)

Pasco: 1 sentinel chicken (5/1)
 Pinellas: 1 live wild bird (1 Red-shouldered Hawk 5/22)
 Putnam: 1 sentinel chicken (5/18)
 Santa Rosa: 10 live wild birds (7 Blue Jays 4/18, 4/25 (also EEE+), 5/2, 5/9 x2, 5/23, 8/8; 1 Cardinal 5/16, 1 Mourning Dove 5/16, 1 House Finch 9/7)
 Sarasota: 1 sentinel chicken (4/10)
 St. Johns: 1 sentinel chicken (10/09)
 Volusia: 1 sentinel chicken (10/23)
 Walton: 7 sentinel chickens (1/03, 1/20 x2, 4/12, 10/02, 10/24 x2); 14 live wild birds (7 Cardinals 3/16, 4/20 x2, 8/24, 9/28, 10/5 x2; 7 Sparrows 2/16, 3/16 x2, 4/20, 8/04, 9/7 (also EEE+), 11/16)
 Washington: 8 live wild birds (1 Red-winged Blackbird 3/16; 3 Sparrows 3/16 x2, 8/04 (also EEE+); 4 Cardinals 4/27, 7/13 x2, 8/31)

Figure 3. Comprehensive West Nile Virus Surveillance, Florida, 2006



3. Mosquito Surveillance

California serogroup (CAL) viruses were isolated from 7 of the 1,261 mosquito pool specimens received from 13 counties this year. No other arbovirus was isolated from mosquitoes.

Pinellas: A CAL virus was detected in a pool of *Anopheles crucians* collected on 5/31.

Sarasota: CAL viruses were detected in 5 pools of *An. crucians* collected on 2/23, 3/2, 3/22, 4/5 and 8/30, and one pool of *Ochlerotatus atlanticus* collected on 7/12.

4. Bird Mortality Surveillance

During 2006, residents of 64 Florida counties reported dead birds to the website maintained by the Florida Fish and Wildlife Conservation Commission (www.myfwc.com/bird/). This resulted in 1,745 reports representing a total of 3,299 dead birds (147 crows, 150 jays, 113 raptors, and 2,889 others). In 2005, 992 reports representing a total of 1,864 birds were received from 59 counties.

Figure 4. Bird mortality reported in Florida in 2006, by species

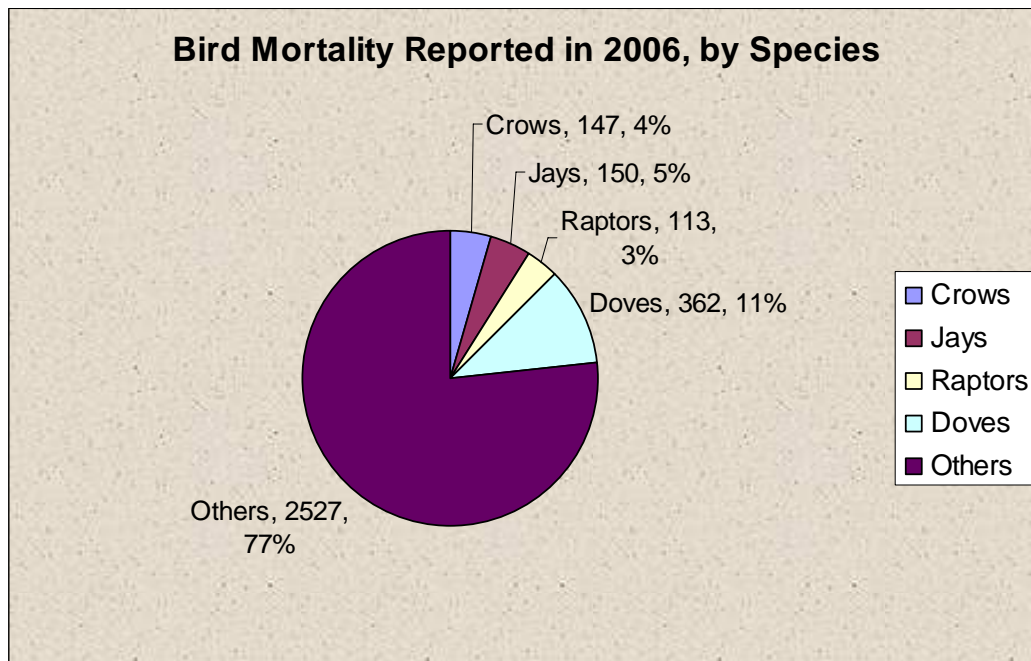
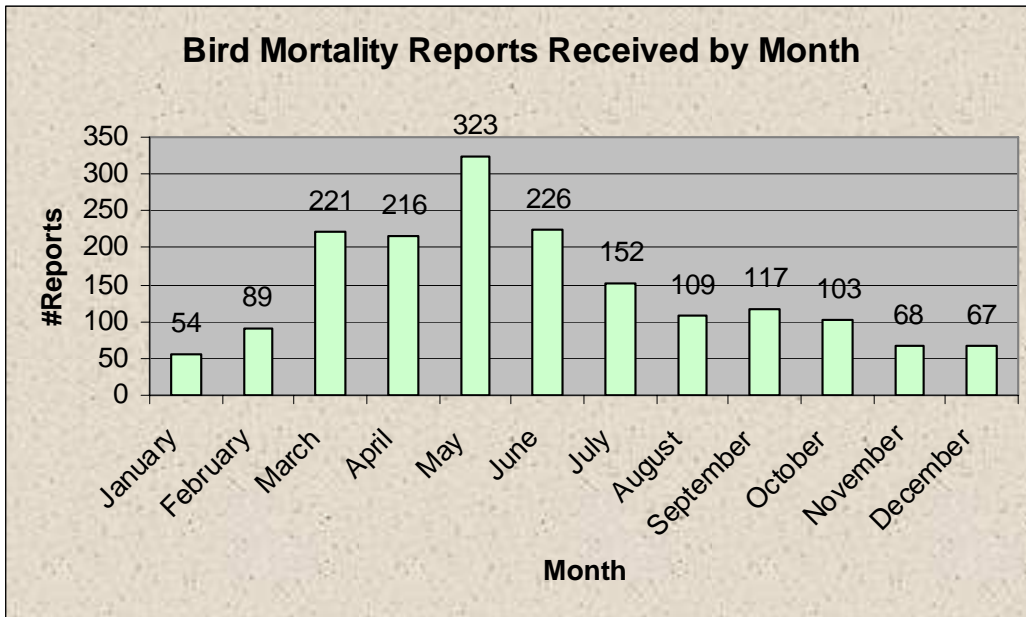


Figure 5. Bird mortality reported in Florida in 2006, by month



Of the 366 dead birds tested at the Tampa State Laboratory, one was positive for antibodies to a California serogroup virus. See page 7 for details. The following guidelines for reporting and shipping birds for testing were promoted throughout the year.

Current Bird Mortality Reporting Guidelines:

1. Report dead birds to www.myfwc.com/bird/. From that site, you can link to online bird identification sites. Under most circumstances, testing is not warranted. There is value in the reported information submitted even if the bird is not tested. The Florida Fish and Wildlife Conservation Commission (FWCC) tracks all clusters of wild bird mortality in the state.
2. The DOH Lab in Tampa still accepts dead bird specimens for testing, as long as they are shipped in good condition. When there is a need to verify the cause of an increased corvid (i.e. crows and jays) or overall bird mortality, a representative sample may be submitted to the Tampa laboratory for arboviral testing. Instructions for submission of dead birds are found at: <http://www.MyFloridaEH.com/community/arboviral/index.html>. Select "How Do I Report?", and then choose "Protocol for Collecting and Shipping Bird Carcasses" under "Dead Birds" subtopic.
3. Clusters of mortality of single non-corvid species or families of birds such as doves, ducks or pelicans are usually not caused by WNV and should not be submitted for WNV testing. However, we still want them reported to the FWCC website.
4. If personnel are not able to offer pick-up service, yet they desire to collect specimens, determine a drop-off station and provide the caller with safe handling instructions. A county may modify their testing approach depending on the availability of other surveillance systems in the county.

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/community/arboviral/index.html> or call the Disease Outbreak Information Hotline which offers updates on medical alert status and surveillance at **888-880-5782**. Environmental Health's web page: www.MyFloridaEH.com