

2011 - ARBOVIRUS FINAL REPORT

Summary of Human West Nile Virus and Other Arboviral Infections, Georgia 2011

West Nile virus (WNV) is a mosquito-borne disease of birds. Humans are occasionally infected with WNV through mosquito bites. Approximately 1 in 5 people infected with WNV develop symptoms of “West Nile Fever”, which is often characterized by fever, headache, fatigue, and muscle pain or weakness. Less than 1% of people infected with WNV develop neurologic disease such as meningitis, encephalitis, or flaccid paralysis.

West Nile virus was first recognized in Georgia in July 2001. That year, there were 6 human cases of WNV encephalitis in Georgia, including one death. Since then cases have been reported each year with varying numbers of human deaths.

To improve identification of Georgians infected with WNV, surveillance for WNV illness in humans was expanded for the 2003 transmission season to include all acute infections of WNV. In addition, routine screening of the nation’s blood supply began in 2003, resulting in the identification of persons infected with WNV prior to the development of symptoms, if symptoms developed at all.

For historical data on arboviral diseases in Georgia since 2001, see the end-of-year summaries posted at <http://health.state.ga.us/epi/vbd/past surv.asp>.

In 2011, Georgia reported 8 confirmed and 14 probable cases of WNV. Three positive viremic blood donors were also identified, but are not counted as any of the 22 cases. Fourteen (64%) of the 22 cases experienced WNV neurologic illness (altered mental status, encephalitis, and/or meningitis) and 8 (36%) were diagnosed with WNV fever. The viremic blood donor remained asymptomatic. Table 1 shows the clinical syndrome for each case.

The average age of cases was 60 years (range 21-85). The average age of those with WNV neurologic illness was 62 years (range 21-85). Twelve (55%) of the 22 cases were male. Unlike previous years, the majority of cases were reported in July and August, likely due to the early onset of warm weather in the spring of 2011 (Figure 1). Table 2 shows the counties of residence of each case.

Table 2: Cases by County

WNV Cases by County (includes asymptomatic cases*)	
County	Count
Butts	1
Chatham	10
Crisp*	1
DeKalb*	4
Fayette	1
Fulton*	2
Glynn	3
Muscogee	2
Whitfield	1

Table 3: Dengue - County of Origin

Virus	Month of Onset	County of Origin
DEN	February	Dutch Caribbean/Curacao
DEN	May	India
DEN	June	India
DEN	July	Puerto Rico
DEN	August	Bahamas
DEN	October	India
DEN	December	Mexico

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Table 1: Clinical Syndromes, 2011

Arbovirus	Month of Onset	County of Residence	Clinical Syndrome	Fatality
DEN	February	Cobb	Dengue Fever	No
	May	Gwinnett	Dengue Fever	No
	June	Muscogee	Dengue Fever	No
	July	Fulton	Dengue Fever	No
	August	DeKalb	Dengue Fever	No
	October	Fulton	Dengue Fever	No
	December	DeKalb	Dengue Fever	No
LAC	July	Bibb	Encephalitis - Including Meningoencephalitis	No
		Forsyth	Encephalitis - Including Meningoencephalitis	No
WNV	July	Chatham	Uncomplicated Fever	No
		Chatham	Uncomplicated Fever	No
		Chatham	Meningitis	No
		Glynn	Meningitis	Yes
	August	Butts	Uncomplicated Fever	No
		Chatham	Meningitis	No
		Chatham	Meningitis	No
		Chatham	Encephalitis - Including Meningoencephalitis	No
		Chatham	Meningitis	No
		Chatham	Encephalitis - Including Meningoencephalitis	No
		Chatham	Meningitis	No
		Chatham	Meningitis	No
		Crisp	Asymptomatic	No
		DeKalb	Uncomplicated Fever	No
		DeKalb	Uncomplicated Fever	No
		Fulton	Asymptomatic	No
		Glynn	Uncomplicated Fever	No
		Glynn	Encephalitis - Including Meningoencephalitis	Yes
		Muscogee	Meningitis	No
		Muscogee	Encephalitis - Including Meningoencephalitis	No
	September	DeKalb	Asymptomatic	No
		DeKalb	Encephalitis - Including Meningoencephalitis	No
		Whitfield	Uncomplicated Fever	Yes
	October	Fayette	Encephalitis - Including Meningoencephalitis	No
		Fulton	Uncomplicated Fever	No

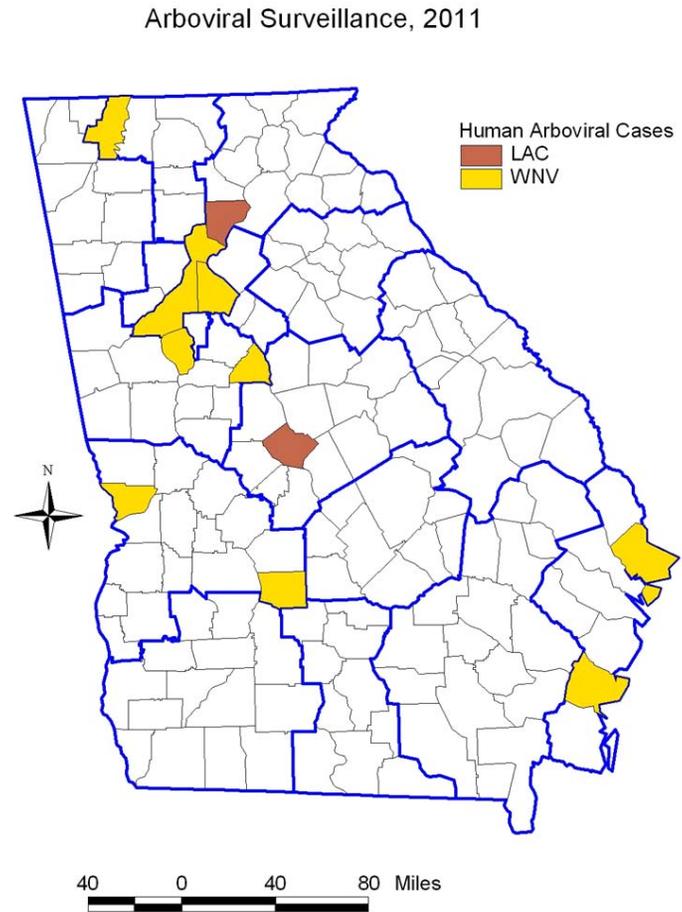
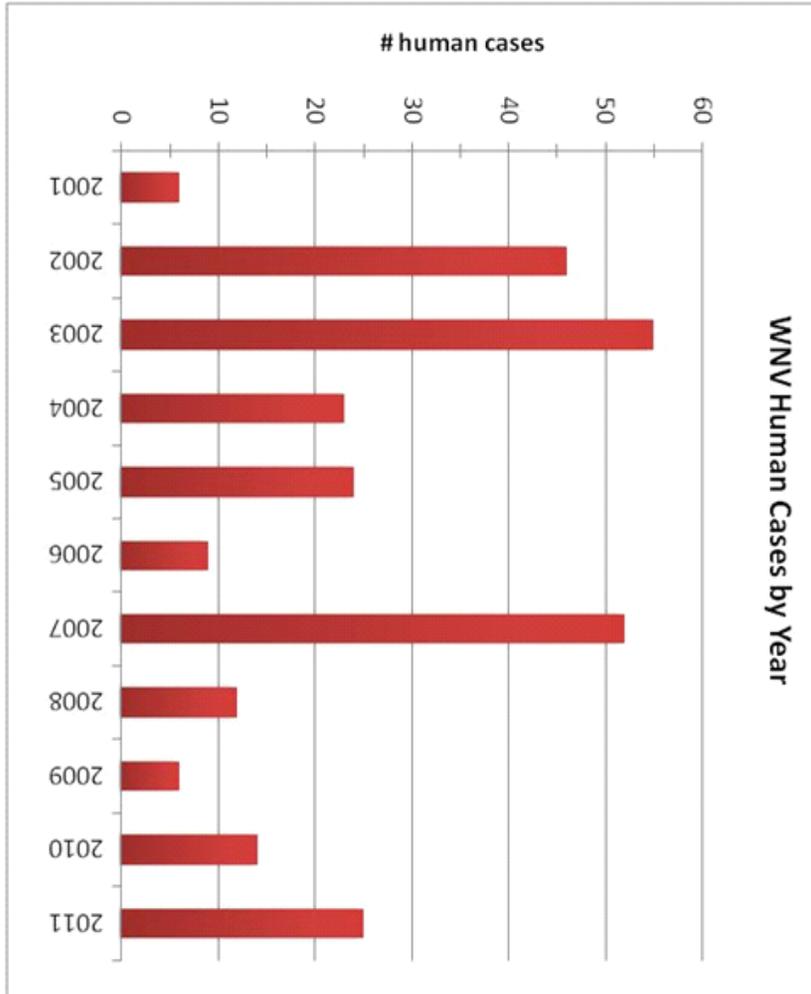
In addition to WNV, one confirmed and one probable case of LaCrosse Encephalitis was reported in Georgia in 2011. Seven internationally acquired cases of Dengue were also reported (Table 3).

Probable: An encephalitis or meningitis case occurring during a period when arboviral transmission is likely and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum IgG antibodies in the same or a later specimen.

Confirmed: An encephalitis or meningitis case that is laboratory confirmed.

If you have questions or comments, please contact Melissa Ivey, MPH, Human Arboviral Infections Surveillance Coordinator at the Georgia Division of Public Health, at 404-657-6442 or mlhall1@dhr.state.ga.us.

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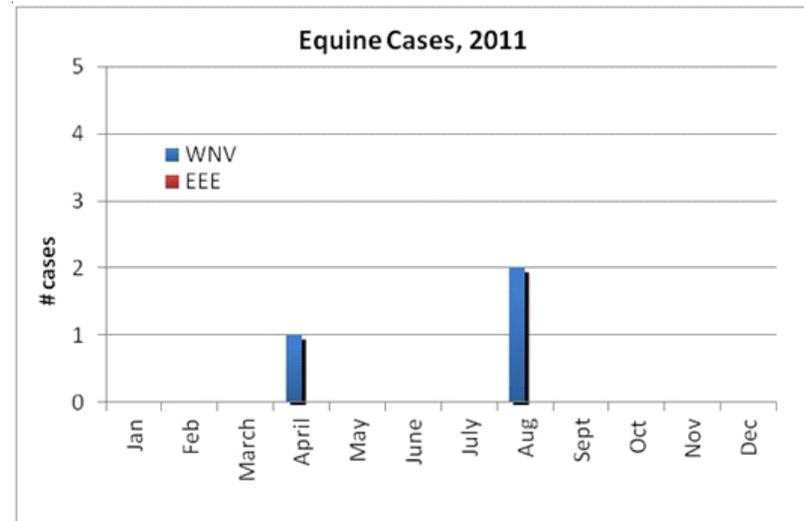
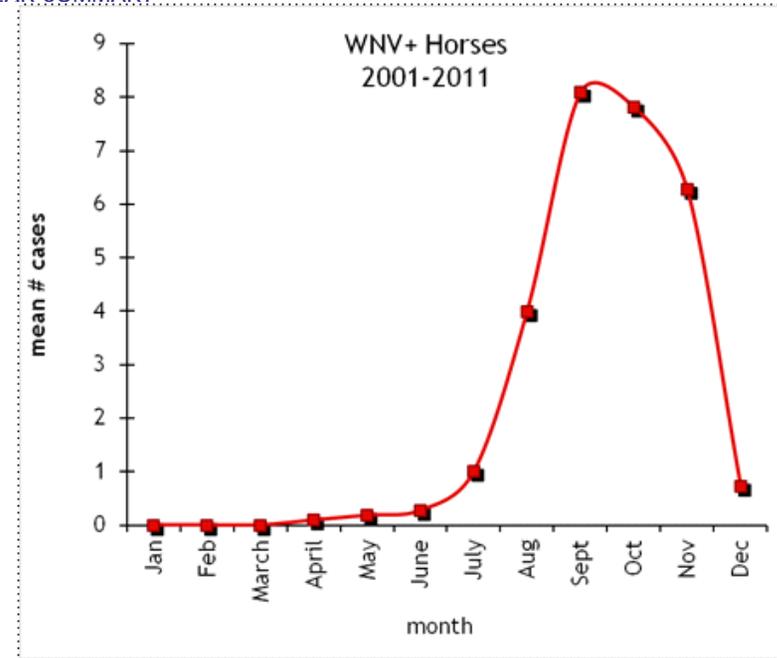
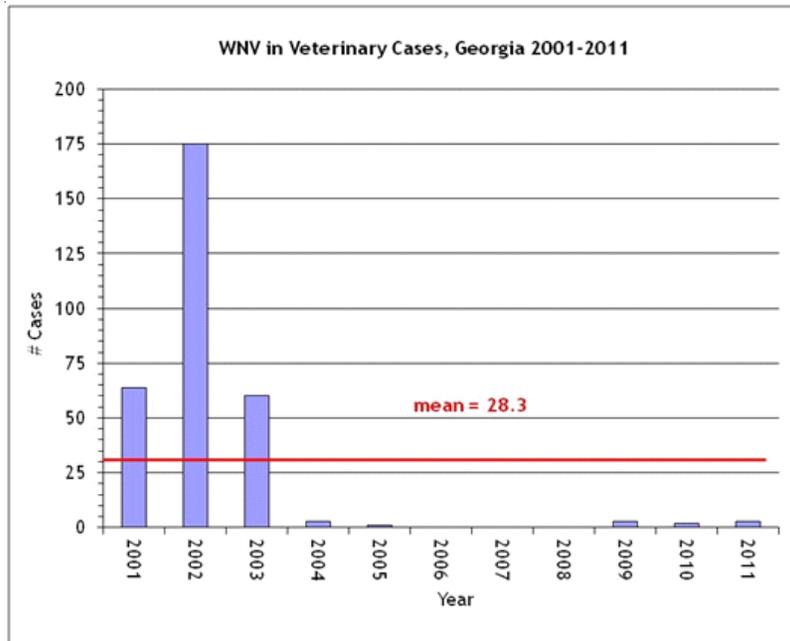


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Veterinary Data

Three horse tested positive for WNV in 2011. The number of cases of WNV in horses has continued to decline since 2002, likely due to increased immunity, increased vaccination, and/or decreased testing.

No horses tested positive for EEE in 2011. Eastern equine encephalitis is endemic in the Coastal and Coastal Plains areas of Georgia. During an average year, four or five EEE+ horses are reported from these areas. The true number of horse cases is probably higher due primarily to under-testing, although sub-clinical infections can occur with EEE.

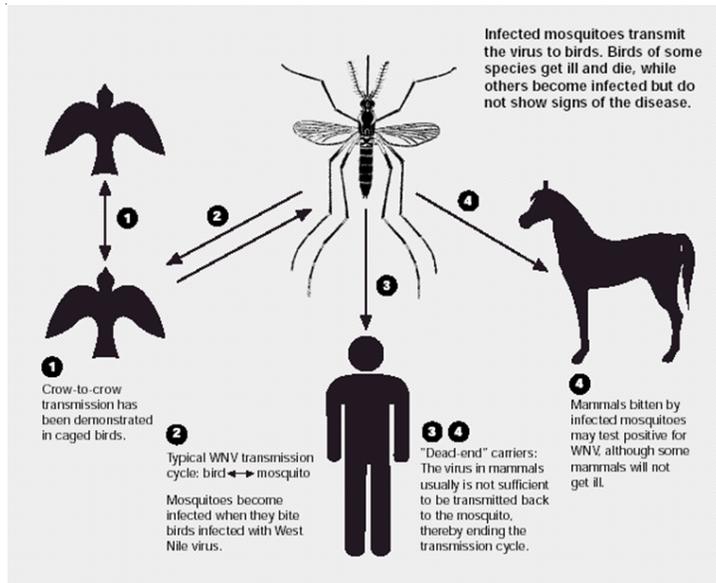


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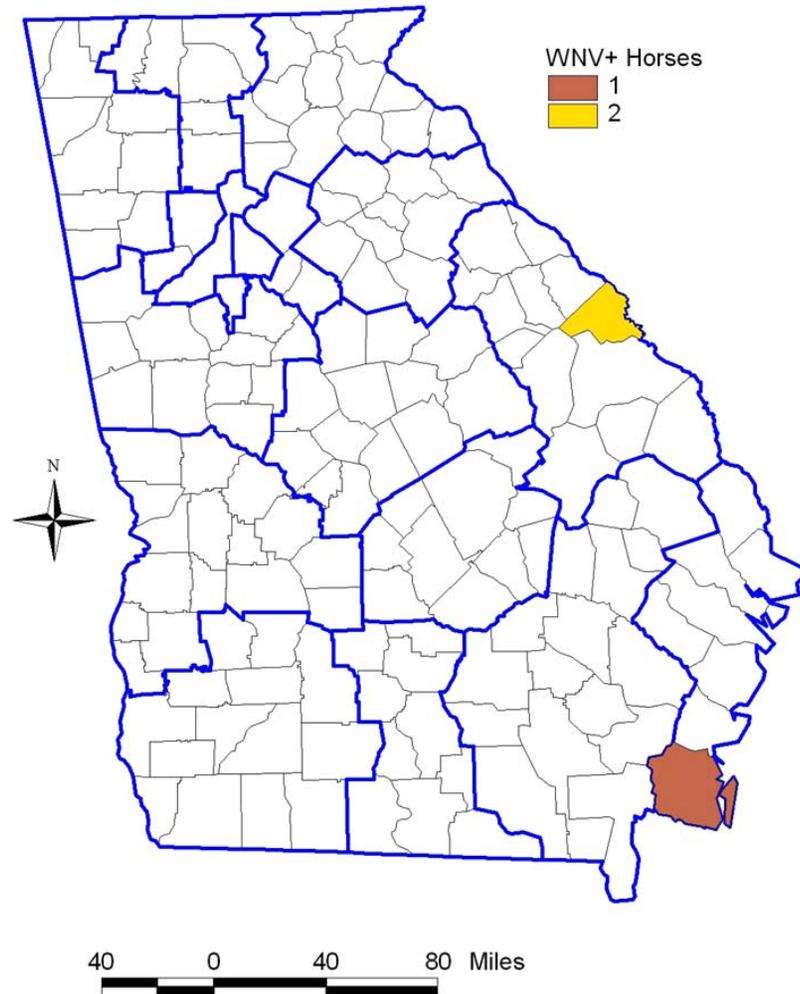
A horse with [West Nile virus](#) will display some of the following symptoms: -

- General loss of appetite
- Hind limb weakness
- Fever
- Impaired vision
- Walking in circles
- Inability to swallow
- Coma

However, sometimes a horse can be infected with West Nile virus and not show any symptoms.



Arboviral Surveillance, 2011



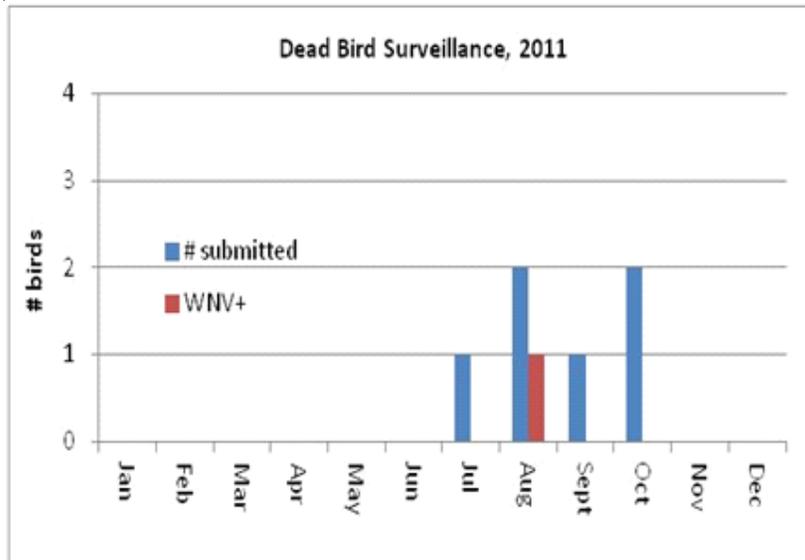
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DEAD BIRD SURVEILLANCE

A total of 6 birds were submitted for testing in 2011. The first birds were submitted for testing in July; WNV was detected in one bird in August. No other viruses were detected in birds.

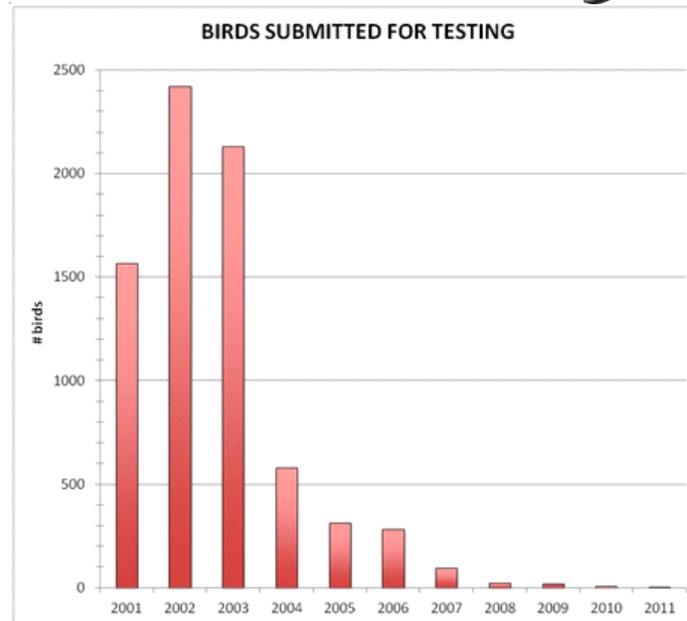
Dead bird surveillance continues to lose ground as a surveillance tool. Counties indicate that fewer birds are being reported by the public, and most counties do not have the resources to pick up and ship birds for testing in any case. Bird testing continues to have some utility where mosquito surveillance data are not available, and positive dead bird reports can be used to trigger public education messages reminding people to wear repellent and to dump out standing water.

County	# Birds Submitted	WNV+
Baldwin	1	
Chatham	2	
DeKalb	3	1

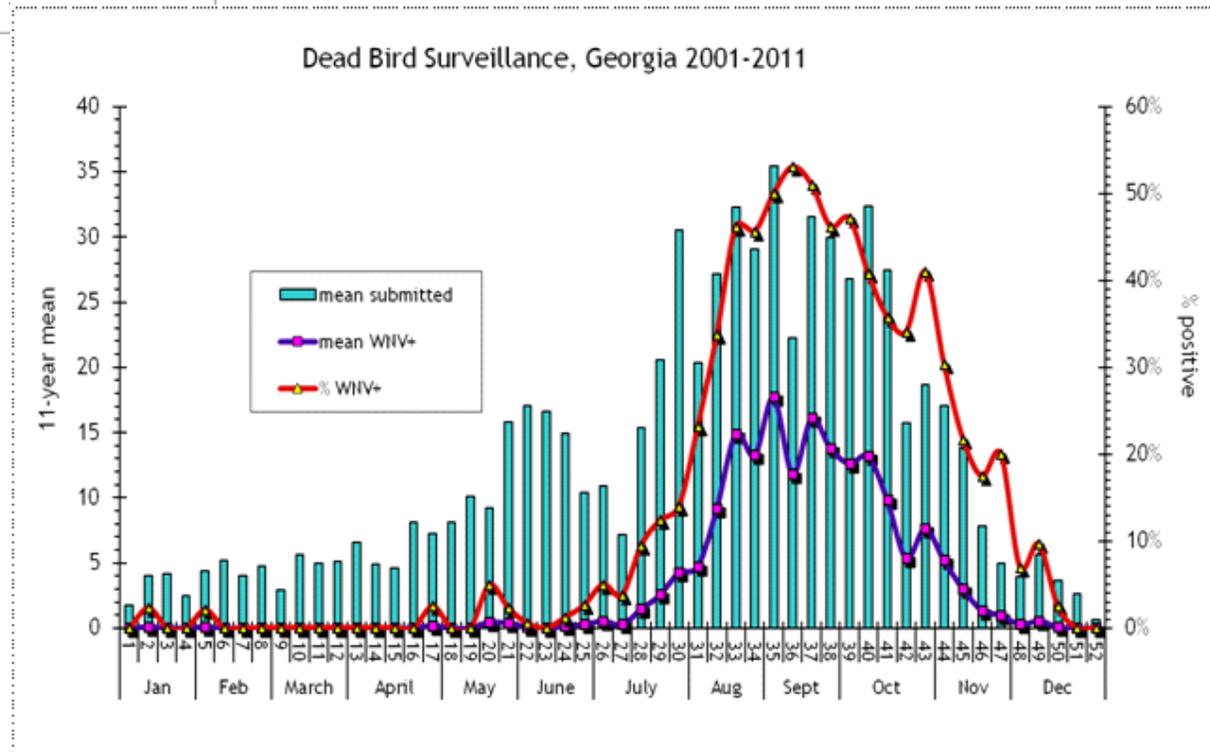
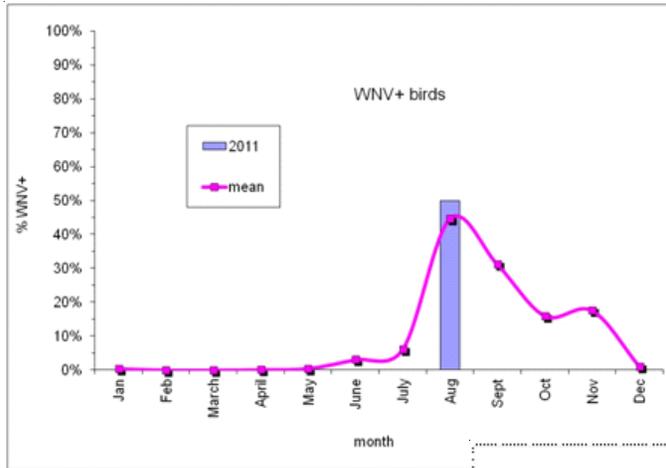


Species	NEG	WNV+	TOTAL	% POS
Eastern Meadow Lark	1		1	
Mourning Dove		1	1	100%
Northern Cardinal	1		1	
Northern Mockingbird	1		1	
Red-eyed Vireo	1		1	
Yellow-shafted Flicker	1		1	
TOTAL	5	1	6	16.7%

Dead bird surveillance may also help provide early detection of the next zoonotic arbovirus introduced into Georgia.



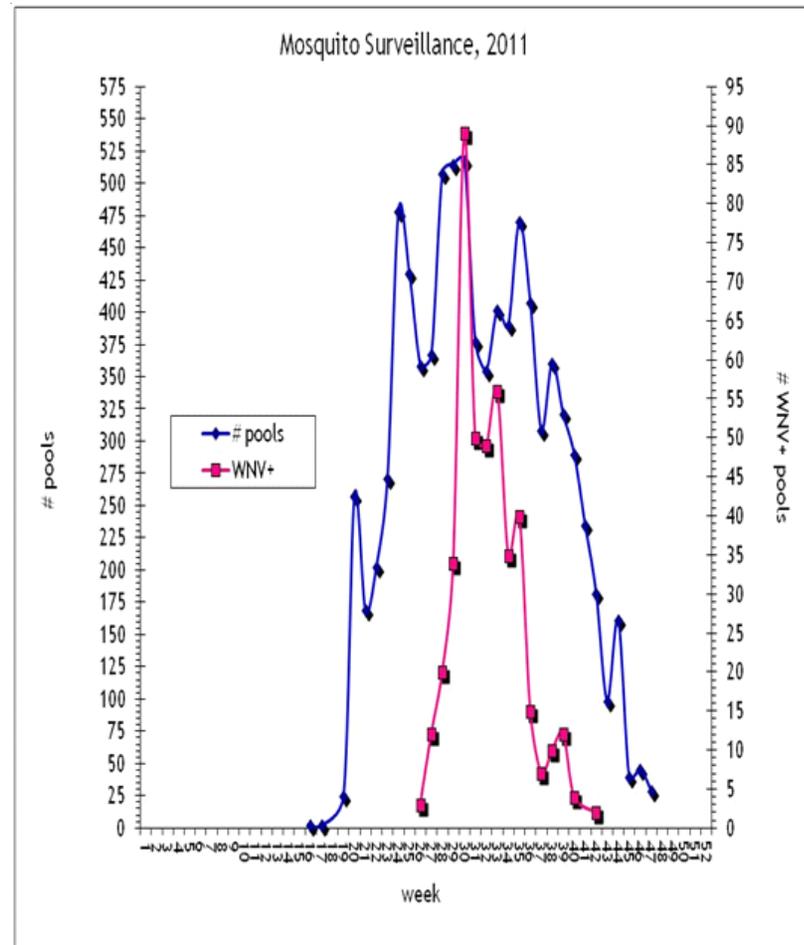
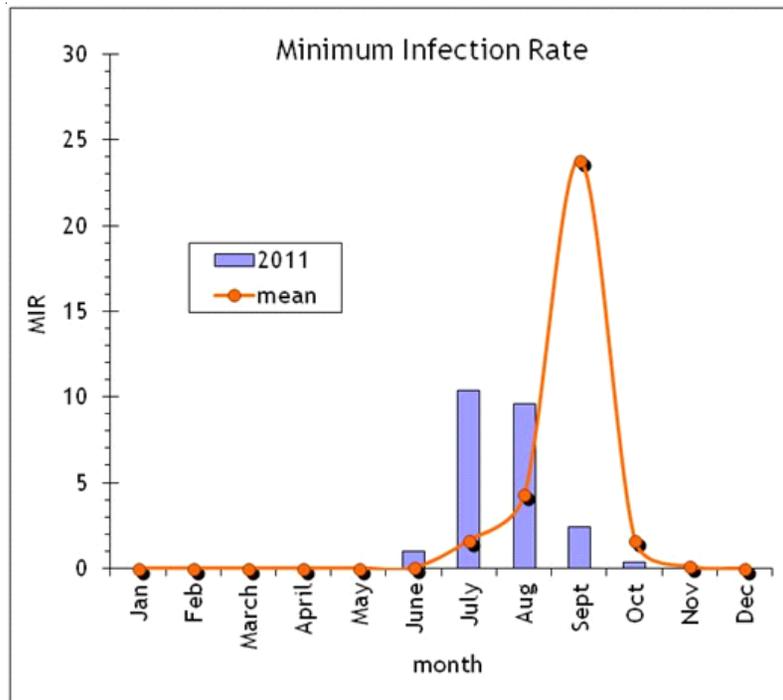
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Mosquito Surveillance

In 2011, some level of mosquito surveillance was done in 18 counties with WNV-positive mosquitoes detected in 7 counties. In addition, mosquito surveillance was conducted at Georgia military installations by the US Army Center for Health Promotion and Preventative Medicine (USA-CHPPM South), and results were shared with GDPH.

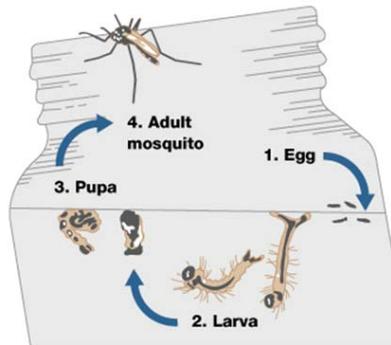
Because of funding cuts, testing of mosquitoes was limited to important vector species; 25 species of mosquitoes were tested. Mosquitoes found WNV+ were *Aedes albopictus*, *Culex quinquefasciatus* and *Cx restuans*; the mosquito species most commonly found positive (99%) was *Cx quinquefasciatus*.



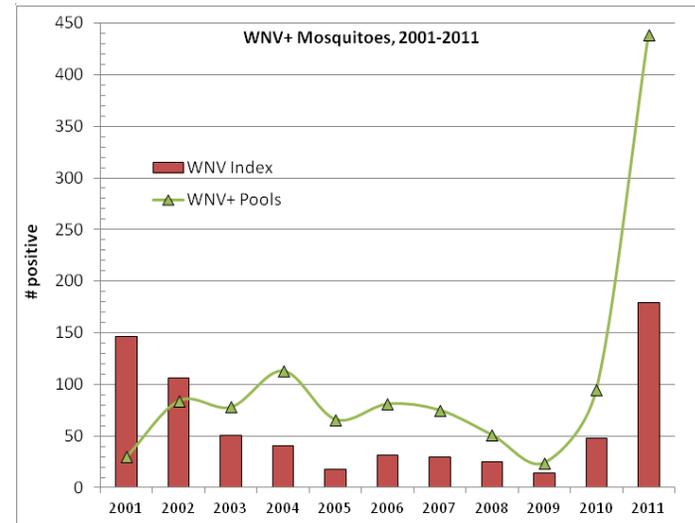
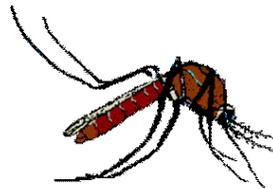
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2001-2011 Virus Isolation	# Mosquitoes per Trap Type				Total
	CDC	Gravid	Other	Unknown	
Cache Valley				6	6
EEE	10	4		1	15
Flanders	13	947		16	919
Flanders (variant)	1	28			29
HJV	5	3			8
HP		1			1
Keystone	1			2	3
LAC				1	1
Orbivirus			1		1
Potosi	3			2	5
South River virus				2	2
TENV	1				1
UNK		1			1
WNV	19	1023		227	1269

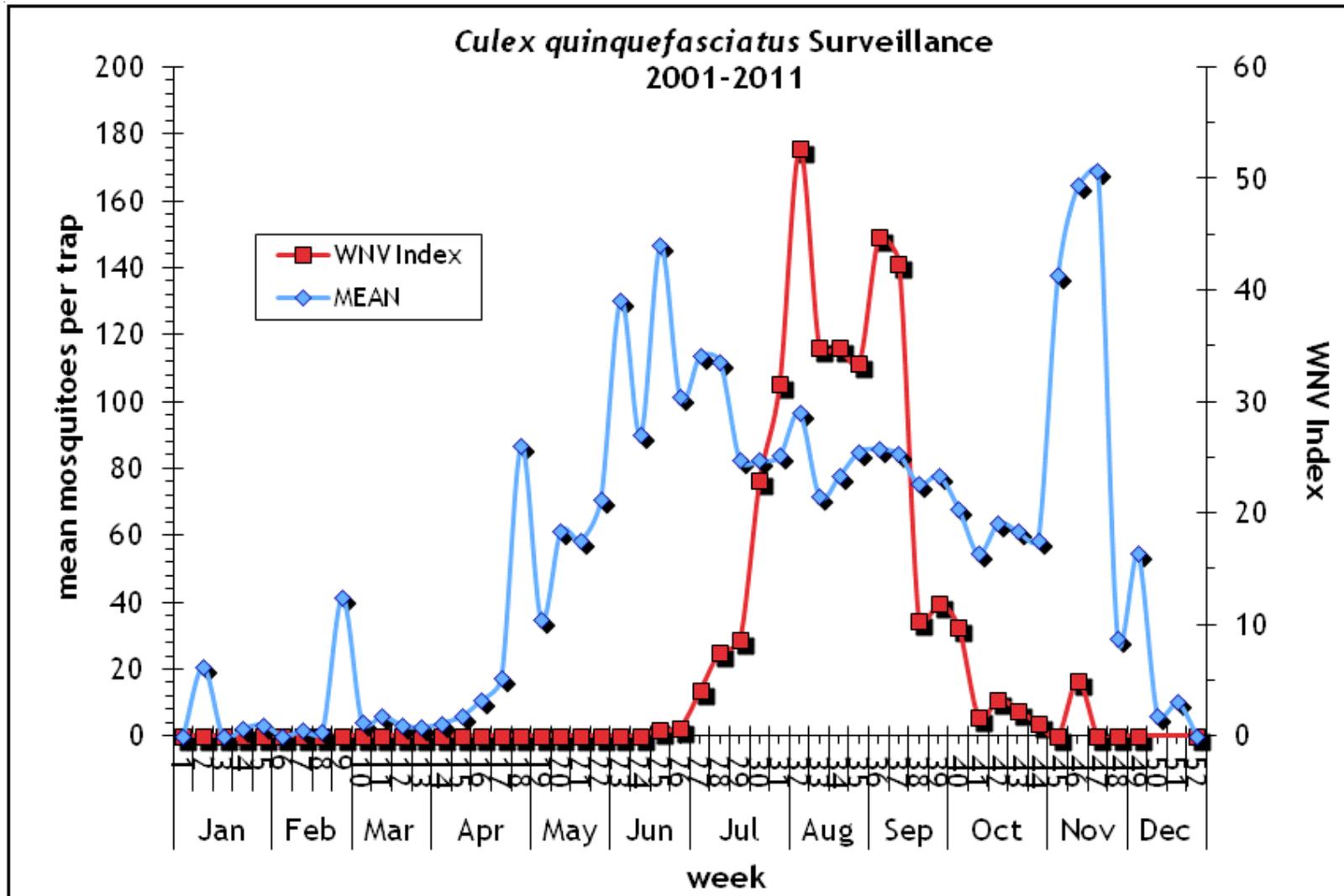
The first positive mosquitoes were detected in metro Atlanta and coastal Georgia in late June. The last positive pool was collected in metro Atlanta and coastal Georgia in October, with peaks in numbers of positive pools occurring in July and August. Onset of WNV detection in mosquito pools was early in 2011 compared to previous



years. The amount of virus found in mosquitoes was more than three times that found in the next highest year. This is likely due to the early onset of warm weather in the spring of 2011.



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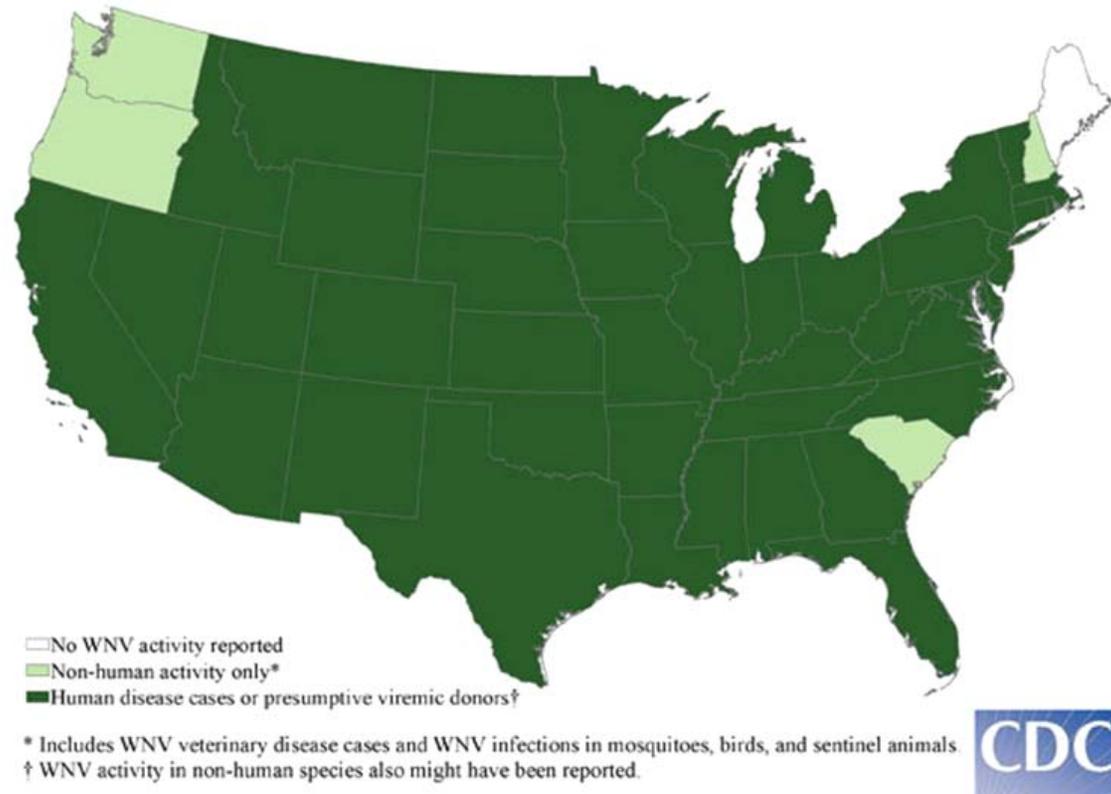


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WNV ACTIVITY MAP:

Non-human WNV infections have been reported to CDC ArboNET from the following states: Arizona, California, Colorado, Connecticut, DC, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming.

Human infections including PVDs have been reported to CDC ArboNET from the following states: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, DC, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.



<http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm>

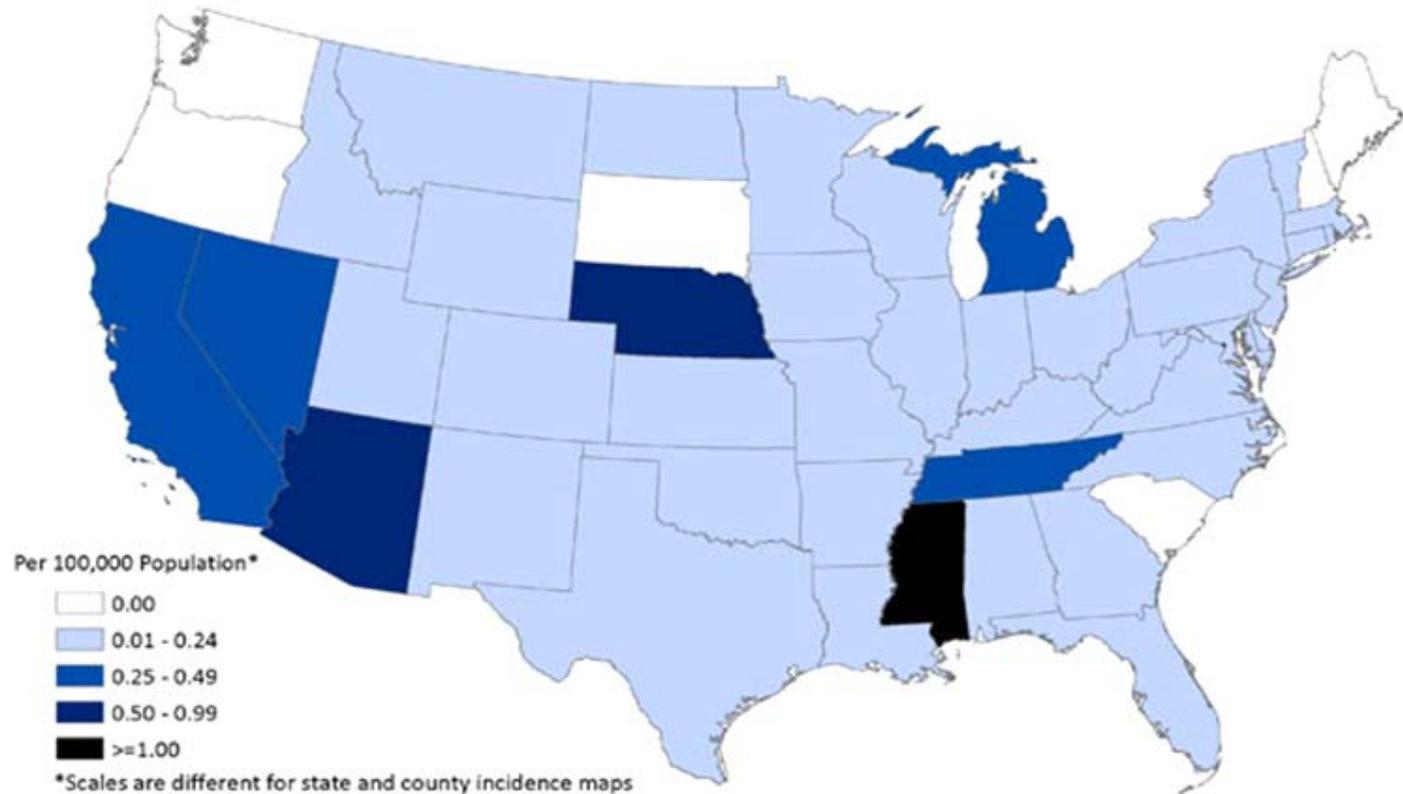
**West Nile virus (WNV) activity reported to ArboNET, by state,
United States, 2011 (as of January 10, 2012)**

NEUROINVASIVE DISEASE MAP

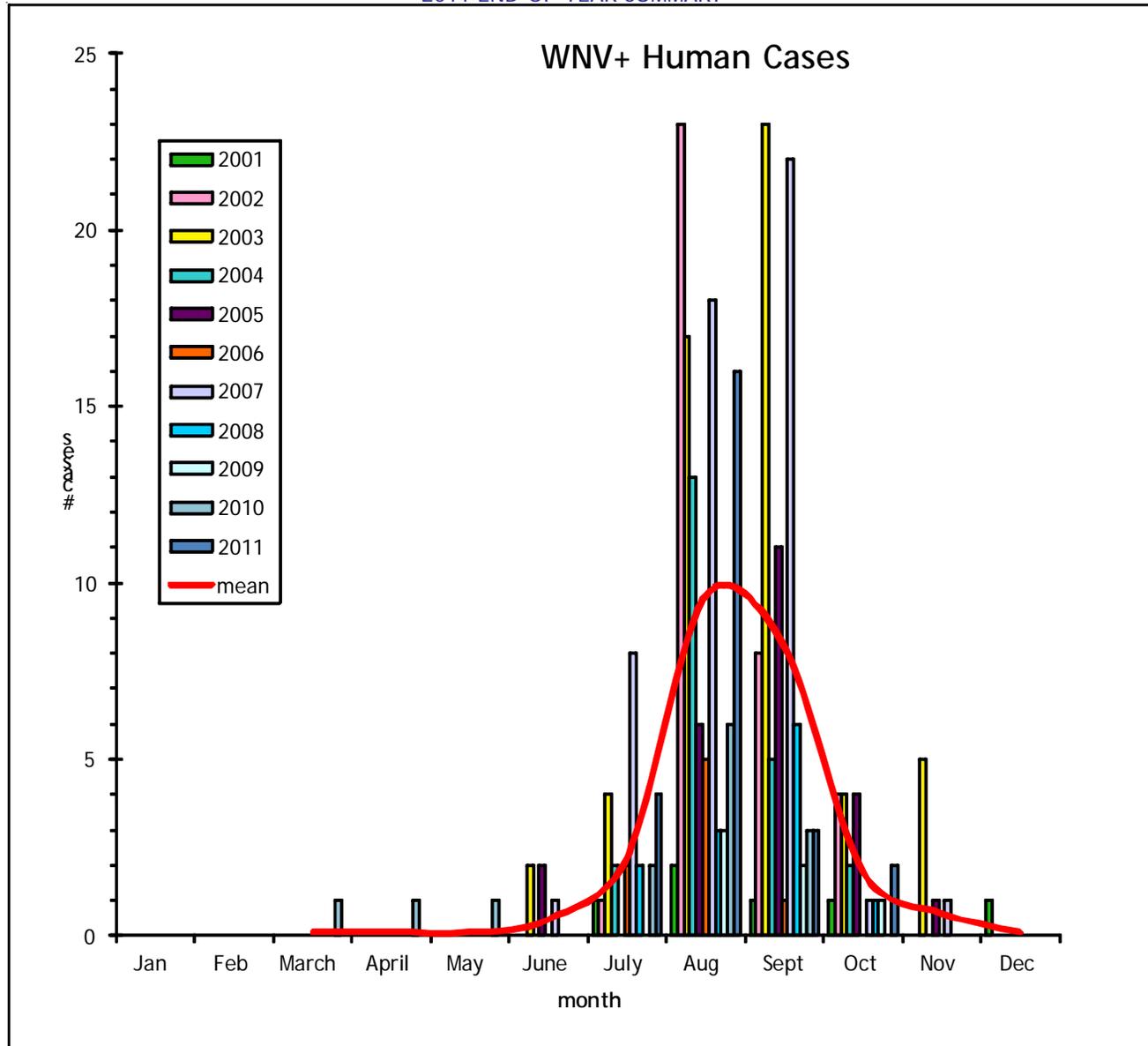
Of the 690 WNV cases, 474 (69%) were reported as neuroinvasive disease cases and 216 (31%) were reported as nonneuroinvasive disease cases. One hundred and thirty WNV presumptive viremic donors (PVDs) have been reported at this time.

West Nile virus (WNV) Neuroinvasive Disease Incidence reported to ArboNET, by state, United States, 2011 (as of January 10, 2012)

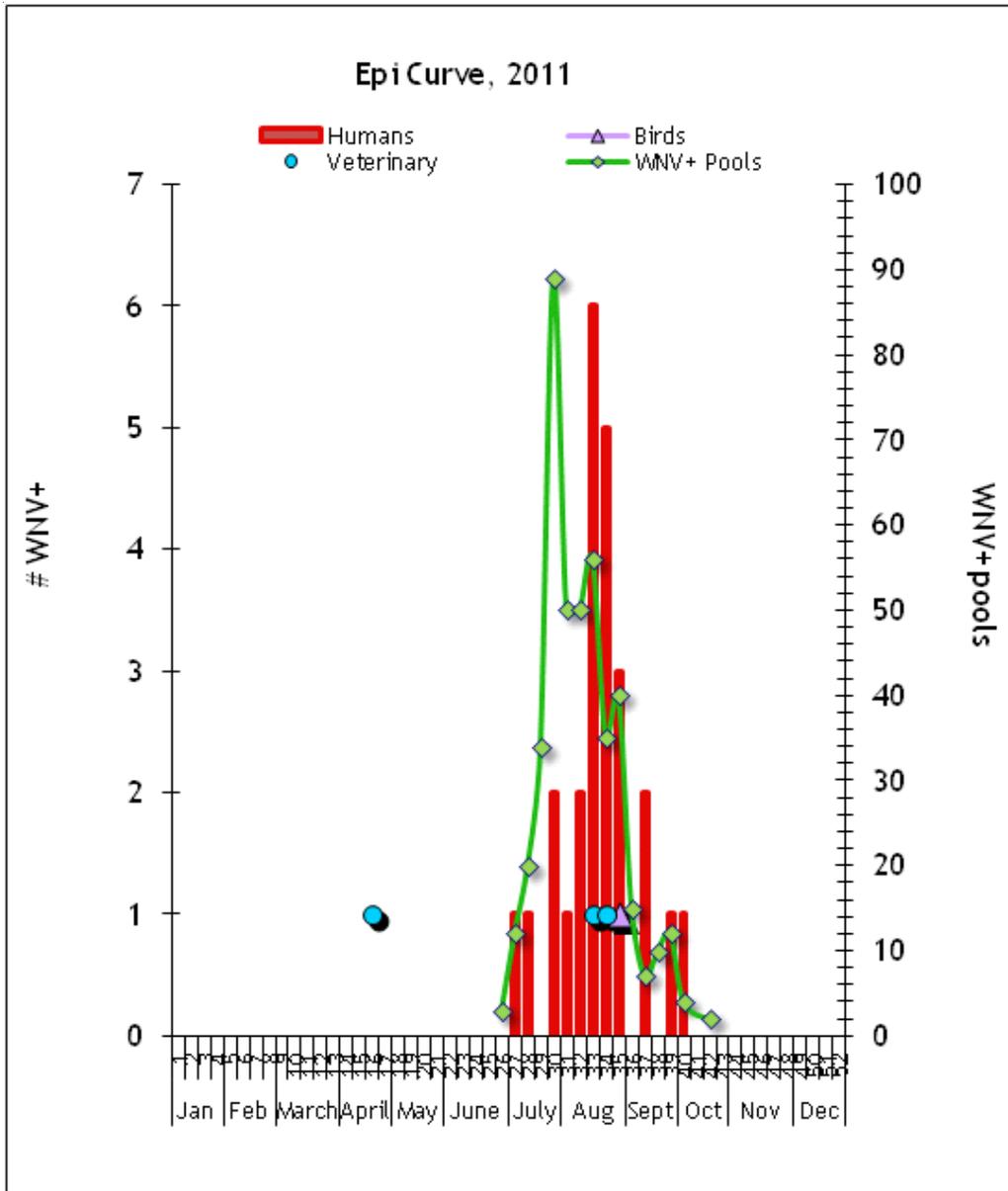
Incidence by state map data description: West Nile virus neuroinvasive disease incidence maps reflect surveillance reports released by state and local health departments to CDC's ArboNET system for public distribution. Map shows the incidence of human neuroinvasive disease (encephalitis, and/or meningitis, and/or acute flaccid paralysis) by state for 2011 with shading ranging from .01 to 0.24, 0.25 to 0.49, 0.50 to 0.99, and greater than 1.0 per 100,000 population.



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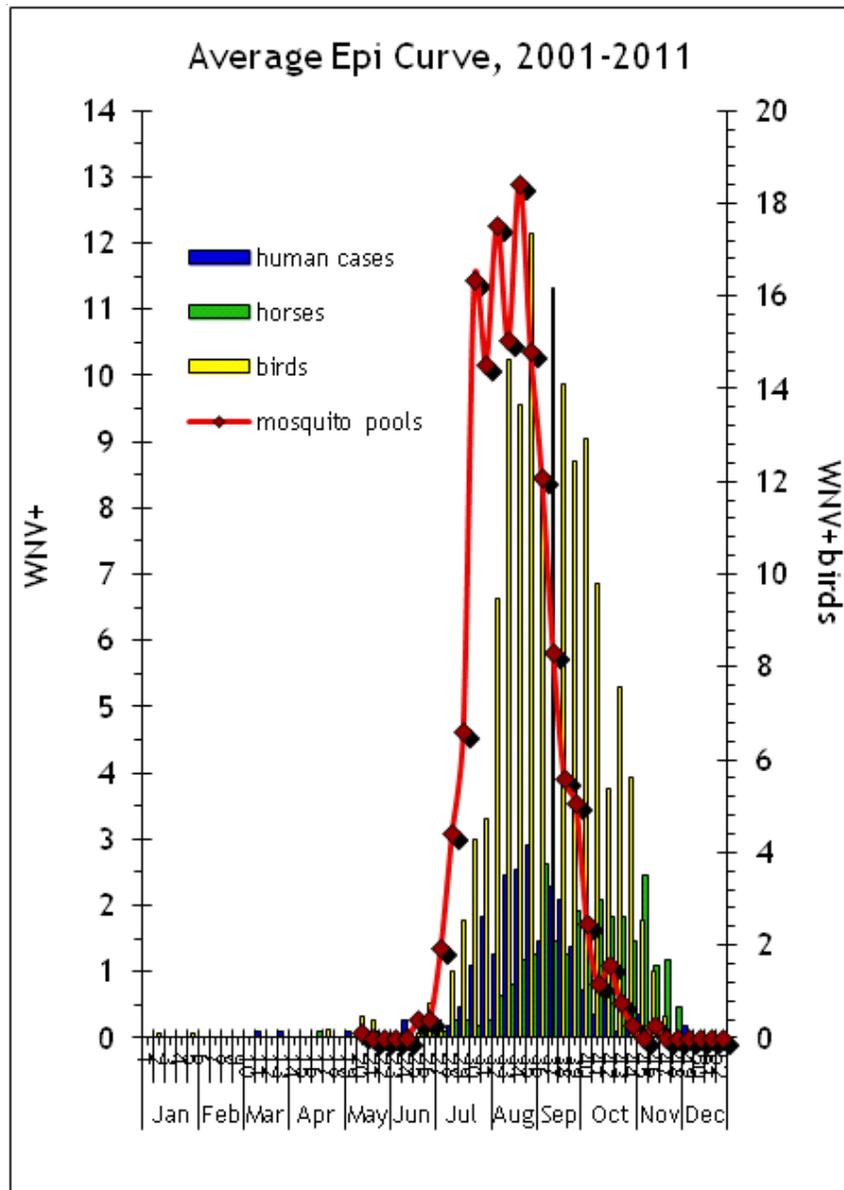
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Constructing epidemic curves is a common and very important practice in epidemiology. Epidemic curves are used to monitor disease occurrence, to detect outbreaks, to generate hypotheses about the cause of an outbreak, to monitor the impact of intervention efforts, and to predict the course of an epidemic.

2001-2011	human cases	veterinary case	mosquito pool	positive bird
total	272	1269	311	1894
mean	24.7	115.4	28.3	172.2

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THANK YOU to the district and county public and environmental health employees, mosquito control workers, veterinarians, and healthcare providers who collected much of the data summarized in this document.

The GDPH Vector-Borne & Zoonotic Diseases Team

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