

LABORATORY SURVEILLANCE OF WEST NILE VIRUS ACTIVITY IN THE HOUSTON METROPOLITAN AREA, 2002-2009



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WEST NILE VIRUS

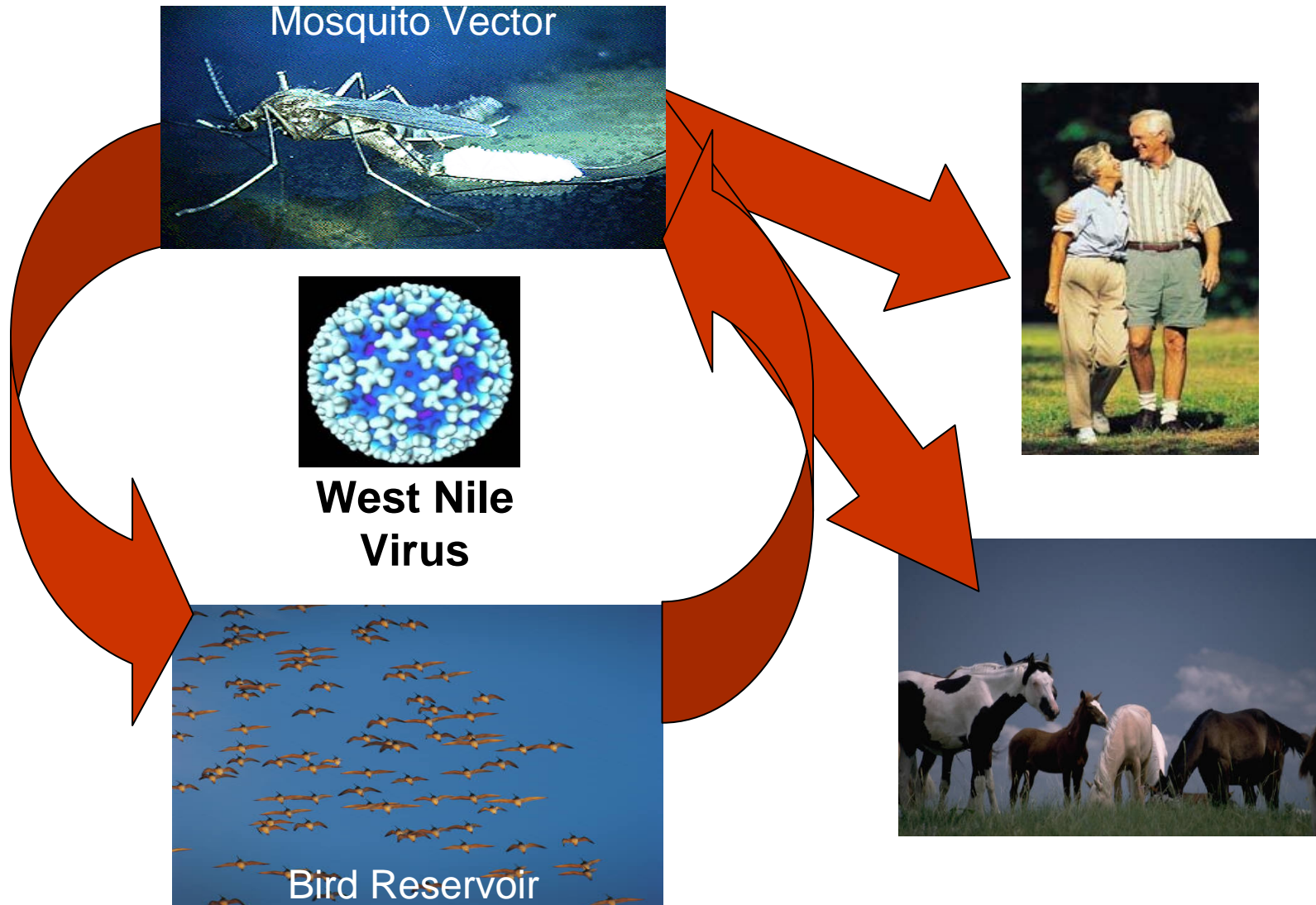
Family: *Flaviviridae*

Genus: Flavivirus

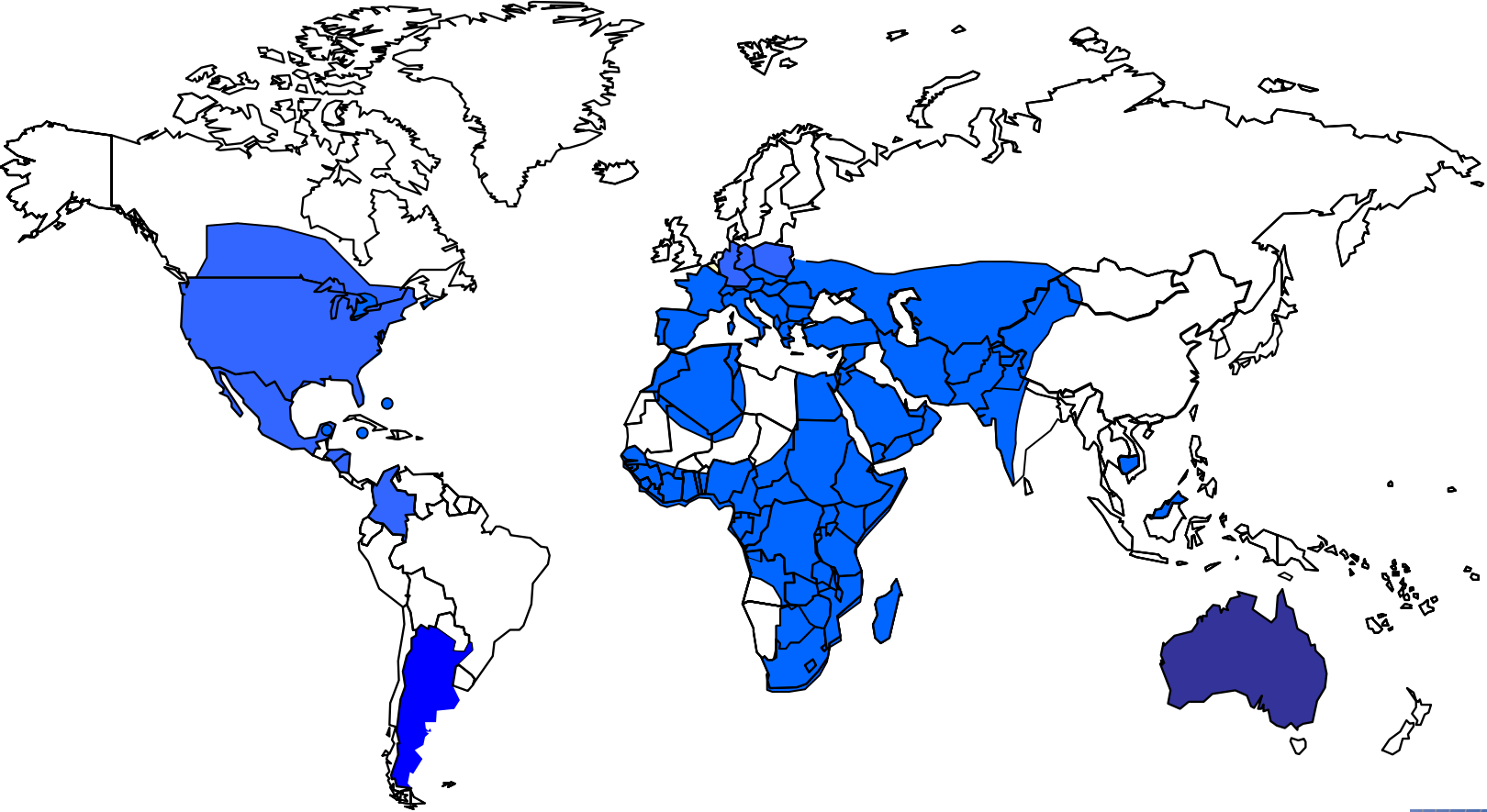
Group: Japanese encephalitis

Related viruses: Japanese encephalitis
St. Louis encephalitis
Murray Valley encephalitis
Usutu

West Nile Virus



Geographic Distribution of WNV

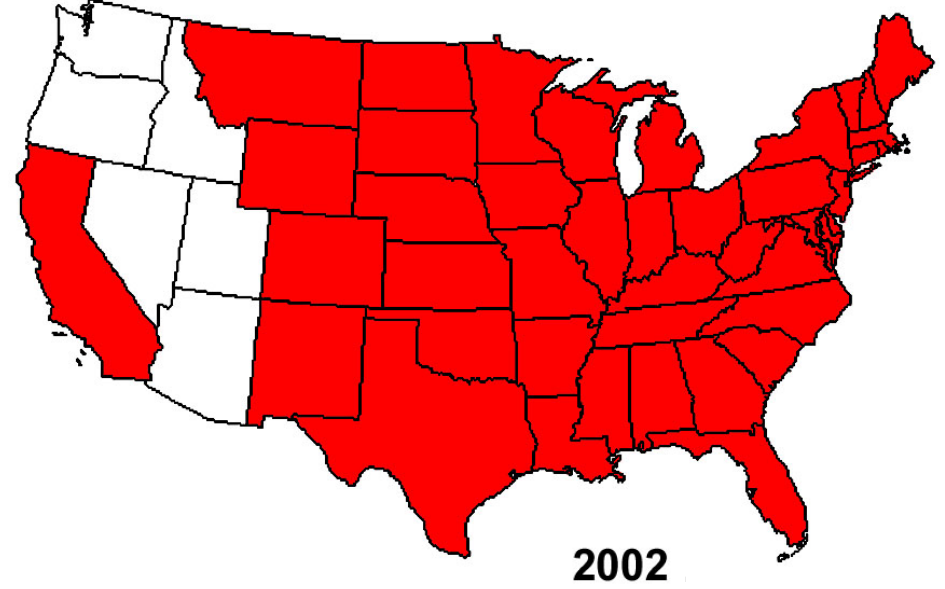
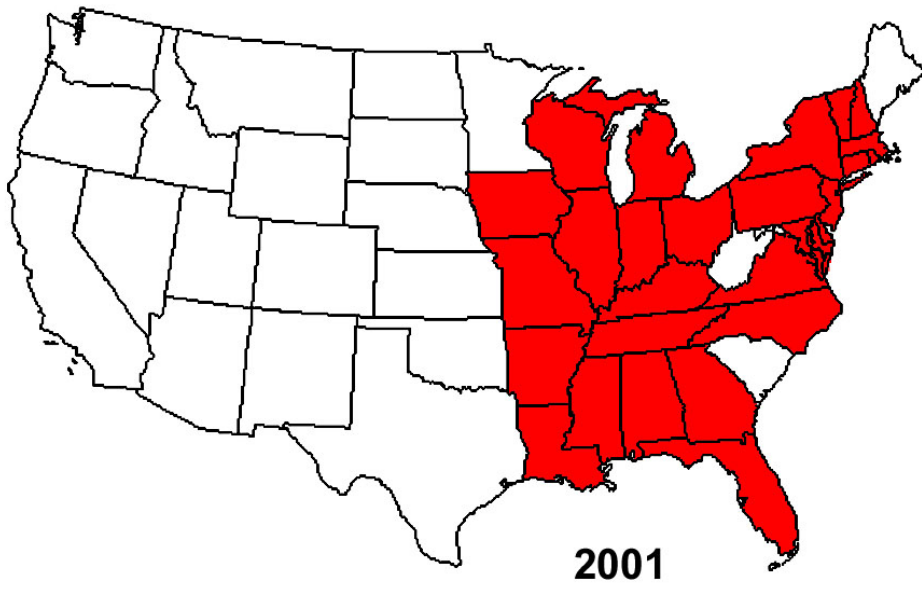
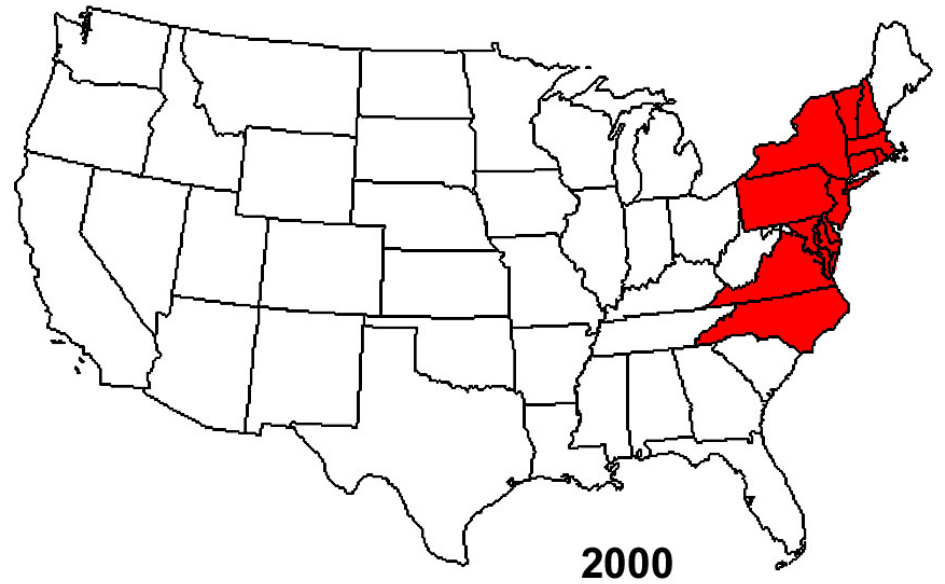
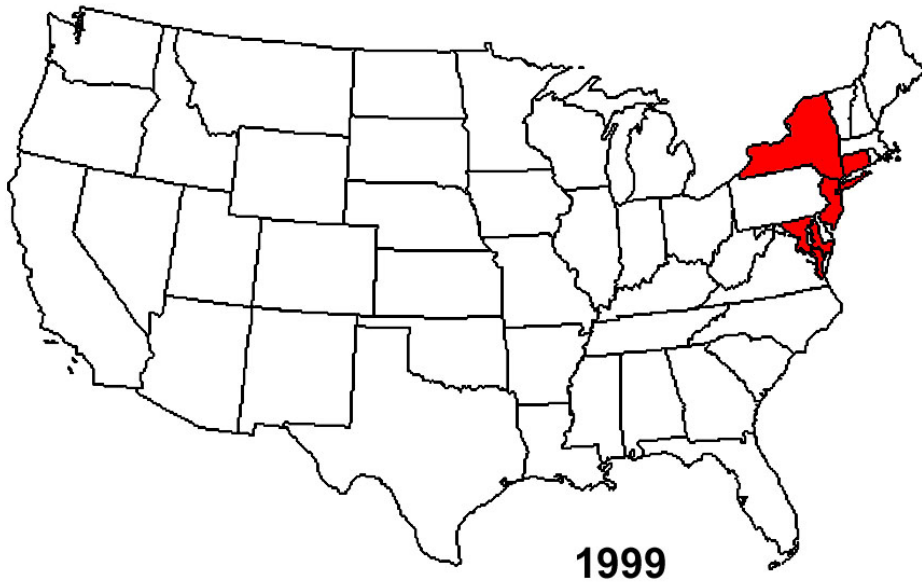


West Nile Outbreaks and Epidemics

- First isolated in 1937 in Uganda.
- First recorded epidemics in Israel in 1950's.
- Israel - 1951-1954, 1957
- France – 1962
- South Africa – 1974
- Romania – 1996
- Italy – 1997, 2008
- Russia – 1999
- France – 2000
- Israel – 2000-2003
- United States & Canada – 1999-2009

Introduction of WNV to the US

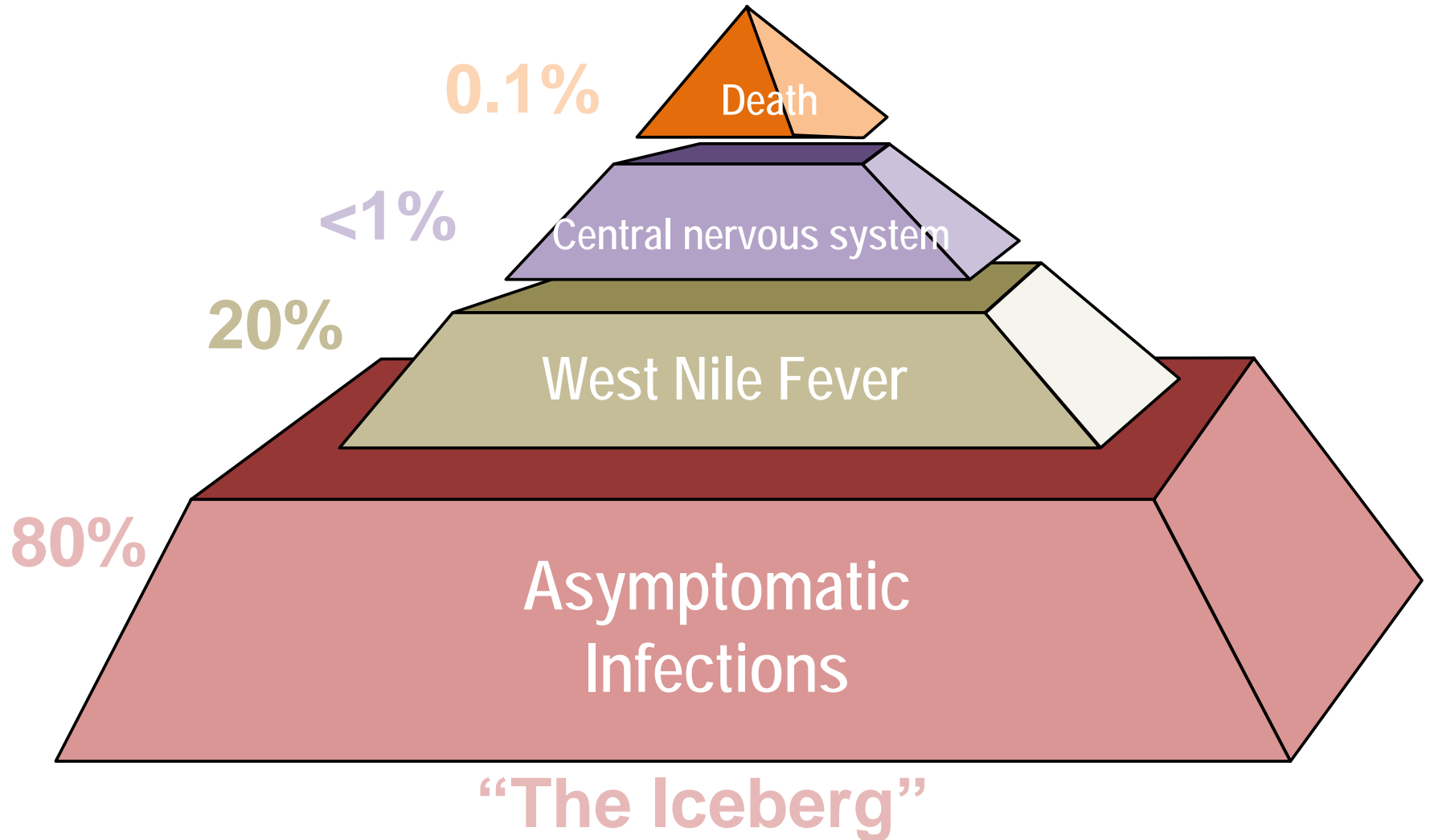
- 1999- WNV was first isolated in NYC
 - Originally believed to be an epidemic of SLE
 - Initial outbreak involved:
 - 62 humans cases with 7 deaths
 - 25 equine cases with 9 deaths
 - large number of birds were also infected
 - Virus isolated from New York, New Jersey, Connecticut and Maryland



Clinical Manifestations of WNV Infection

- 80% of human infections are asymptomatic
- 20% of human infections are symptomatic
- ~1 in 150 human infections develop encephalitis
- Case: fatality ratio in human encephalitis cases is about 9-11%
- Risk of encephalitis increases with age, immunosuppression, and possibly underlying diseases such as diabetes and hypertension.

West Nile Clinical Manifestations



How many people in the U.S. have been infected with WNV since its introduction in 1999?

Rate of neuroinvasive disease

CDC – 1:150

Busch et al. – 1:256

Total neuroinvasive cases – 11,837 (Aug. 1999 – Sept. 2009)

Total WNV infections in U.S.

(CDC) $150 \times 11,837 = 1,775,550$

(Busch) $256 \times 11,837 = 3,030,272$





Harris County, Texas West Nile Virus Activity Update 2006

Harris County
HCPHES
Public Health & Environmental Services



Harris County Zip Code Map With

- New WNV Confirmed Dead Birds (2)
- WNV Confirmed Dead Birds (181)
- New WNV Confirmed Mosquito Activity (38 samples)
- WNV Confirmed Mosquito Activity (304 samples)

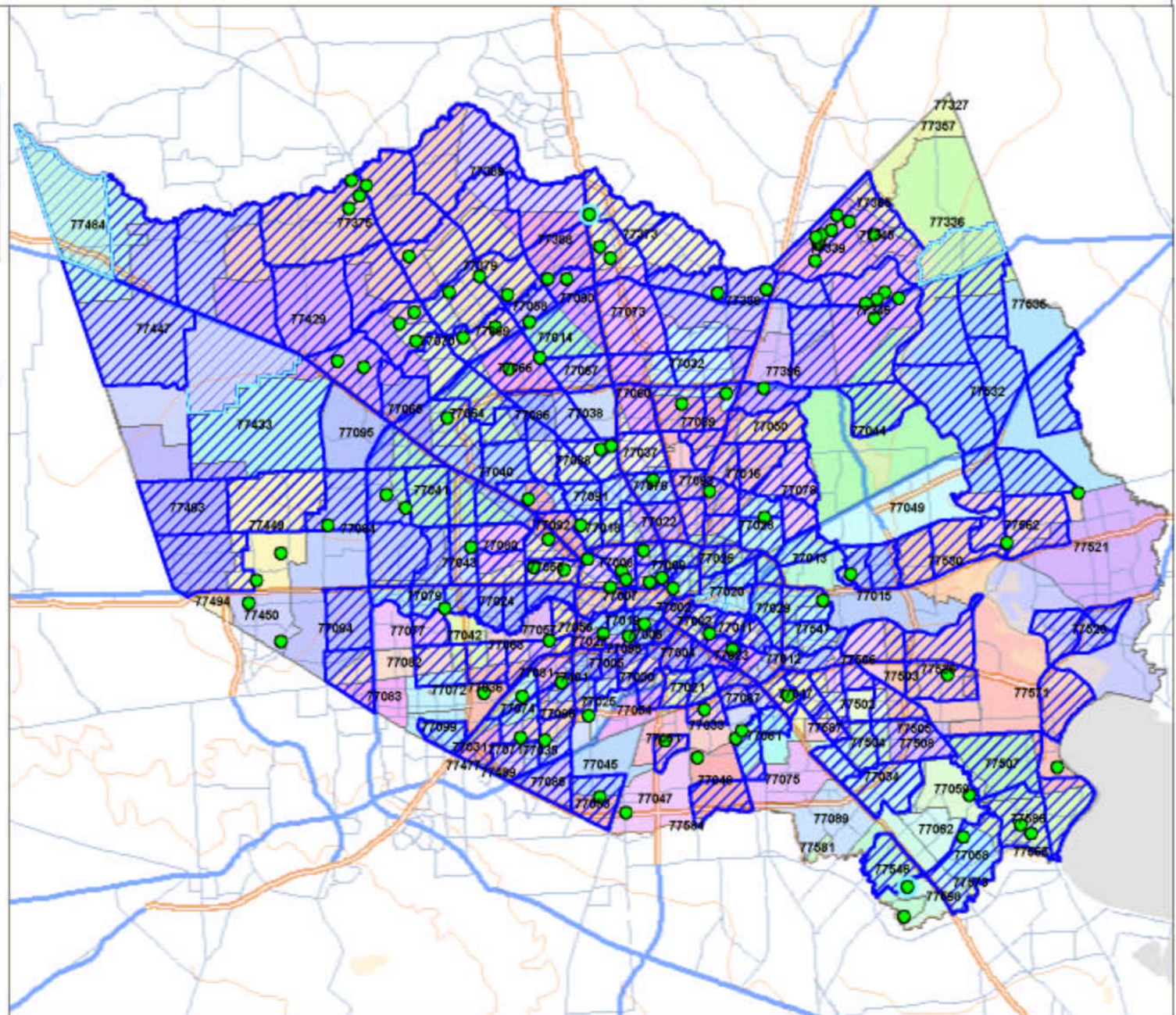
This map displays current mosquito-borne disease monitored by Harris County Public Health and Environmental Services Mosquito Control Division Houston, Texas.

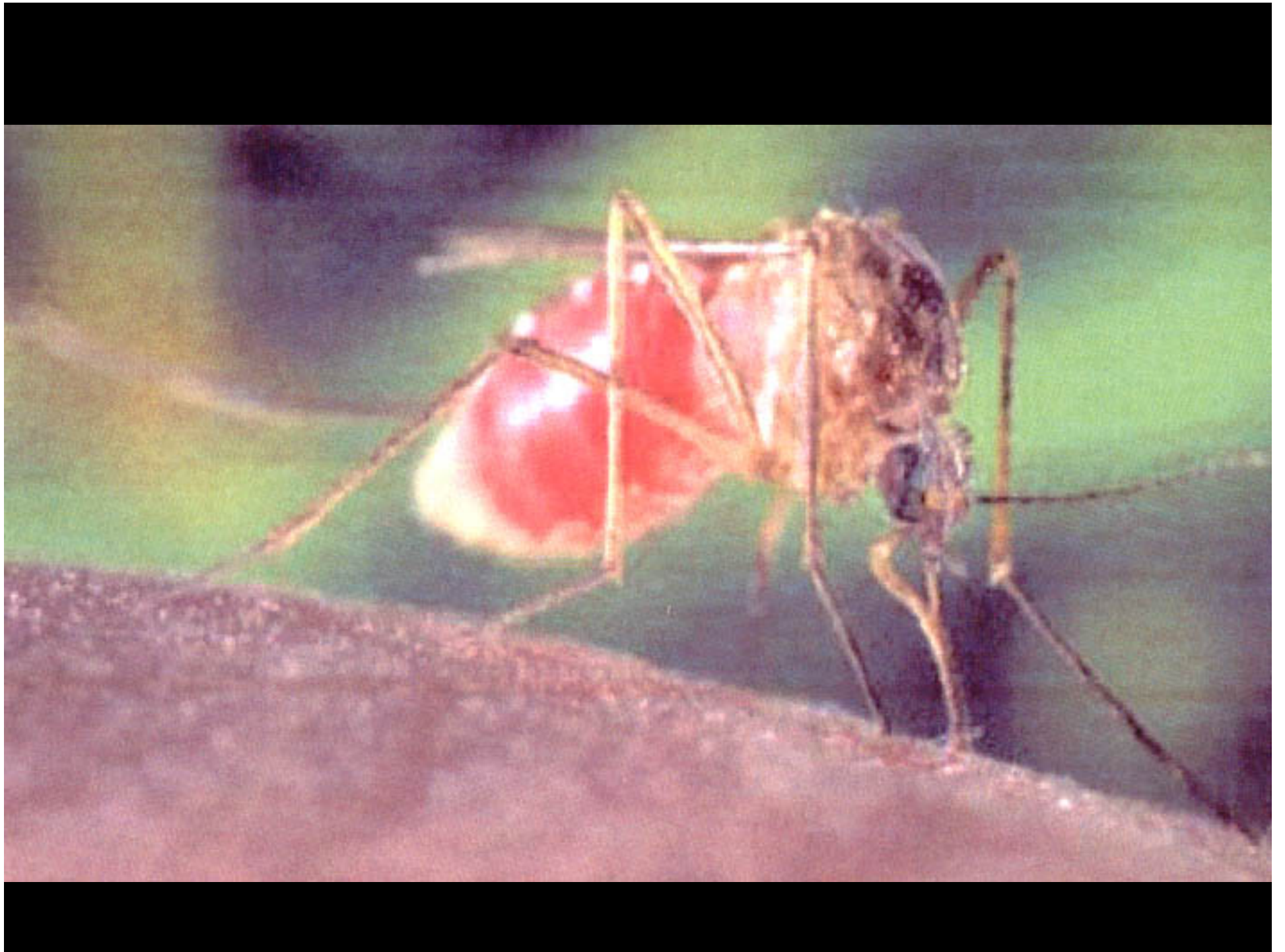
The data in this map may not be duplicated without permission.
For more information please call (713) 440-4800 or visit our website.

www.HCPHES.org

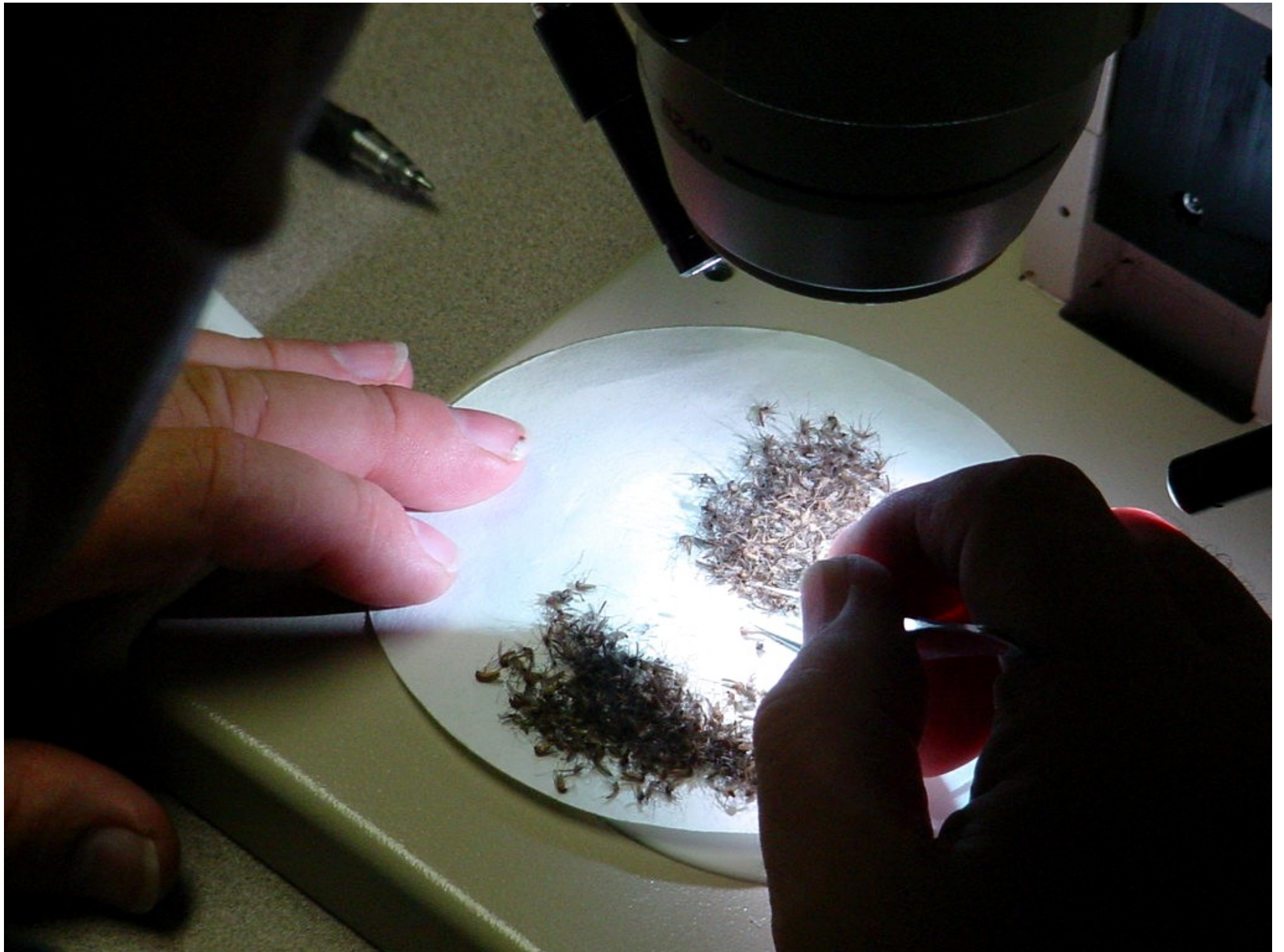


Updated 11/15/06 CHD















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Control

WNV

WNV Isolation Rates Among Dead Birds Collected in Harris County, TX 2003-2005

<u>Common name</u>	<u>No. tested</u>	<u>Percent WNV- positive</u>
Blue Jay	1,064	53.0%
American Crow	49	55.1%
Loggerhead Shrike	26	50.0%
House Sparrow	283	17.0%
Northern Mockingbird	235	6.8%
Northern Cardinal	95	4.2%
Common Grackle	183	2.7%
Mourning Dove	731	1.5%
White-Winged Dove	180	0.6%

Monthly summary of WNV-positive mosquito pools and dead birds collected in Harris County, Texas, between 2002 and 2007.

MONTH	POS. MOSQUITO POOLS	POS. DEAD BIRDS
JAN.	0	1
FEB.	2	3
MARCH	0	4
APRIL	0	3
MAY	30	7
JUNE	370	127
JULY	1054	344
AUG.	1067	440
SEPT.	287	235
OCT.	92	121
NOV.	13	20
DEC.	8	3
TOTAL	2961	1310

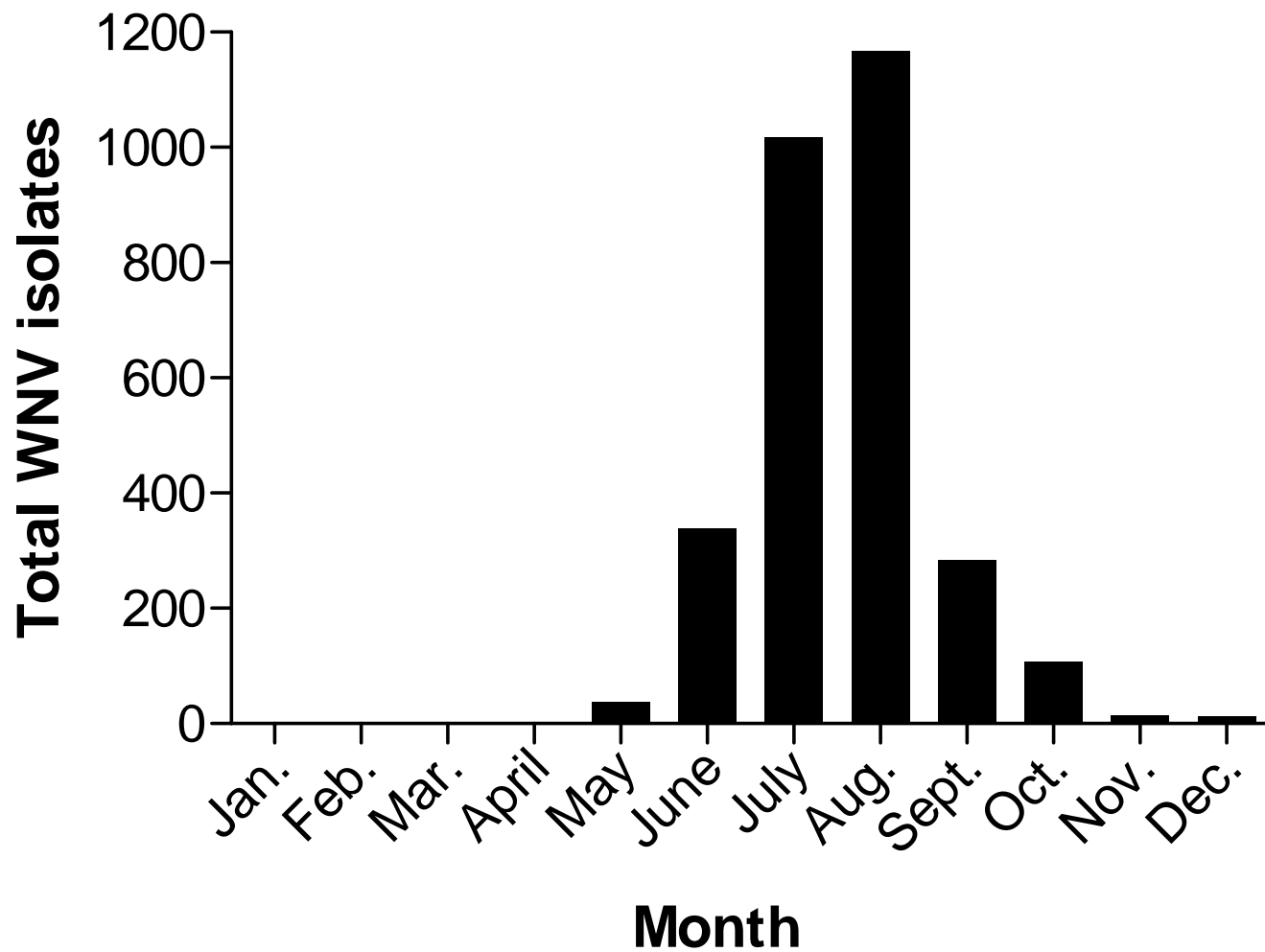


Figure 2. Frequency of West Nile virus isolates in Harris Co., TX by month (2002-2008).

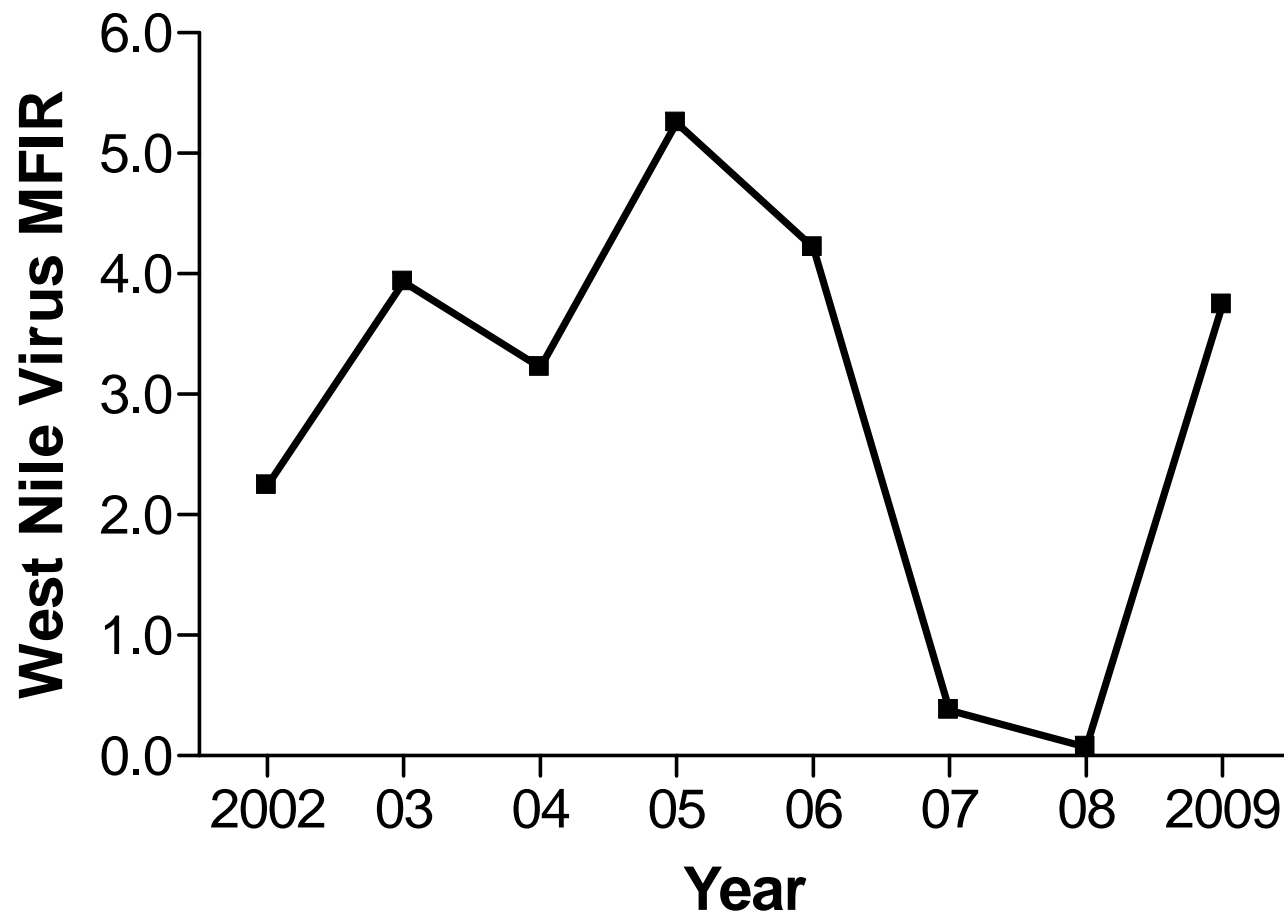
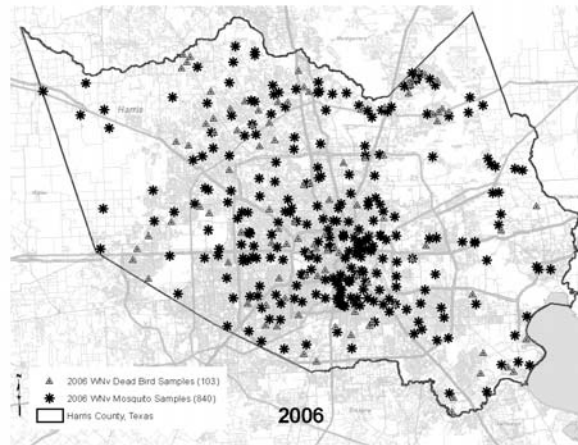
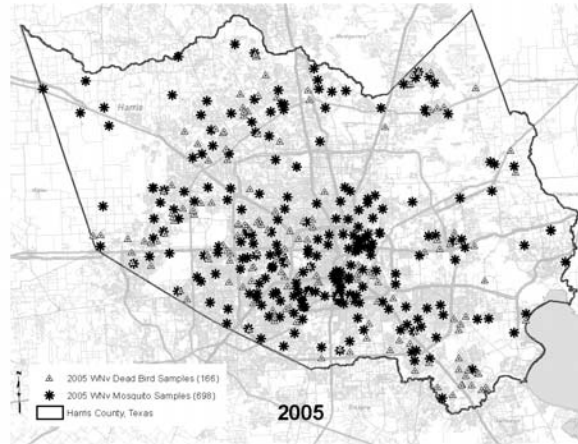
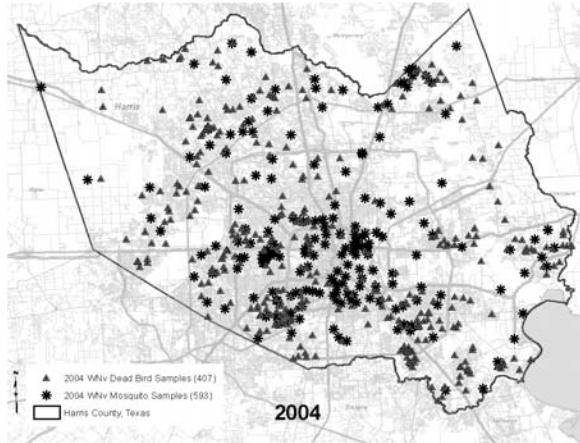
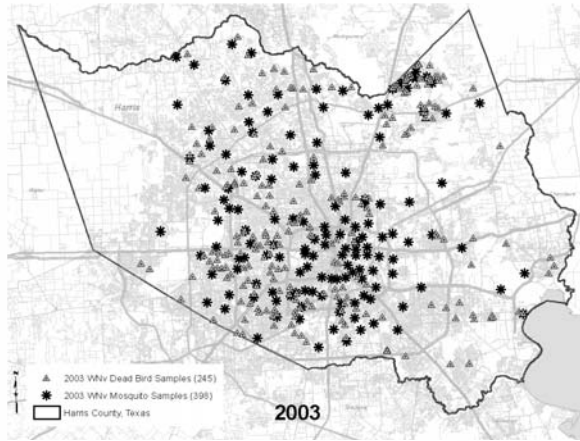
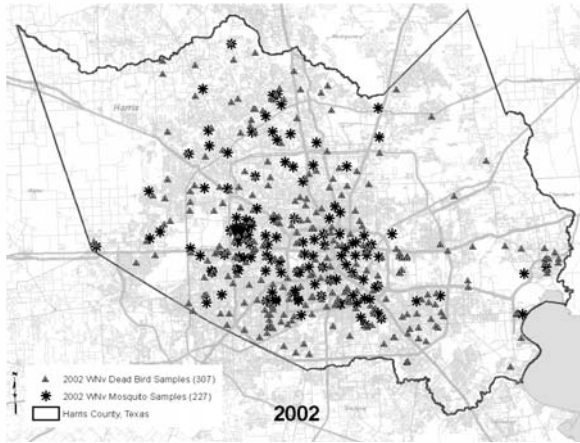


Figure 1. Annual West Nile virus minimum field infection rates (MFIR) among *Culex sp.* mosquitoes in Harris Co., TX during July and August from 2002 to 2009.



Confirmed human cases of WNV infection in Houston 2002-2009

Year	Total cases
2002	105
2003	49
2004	46
2005	42
2006	66
2007	26
2008	2
2009 (Jan. – Sept.)	18



