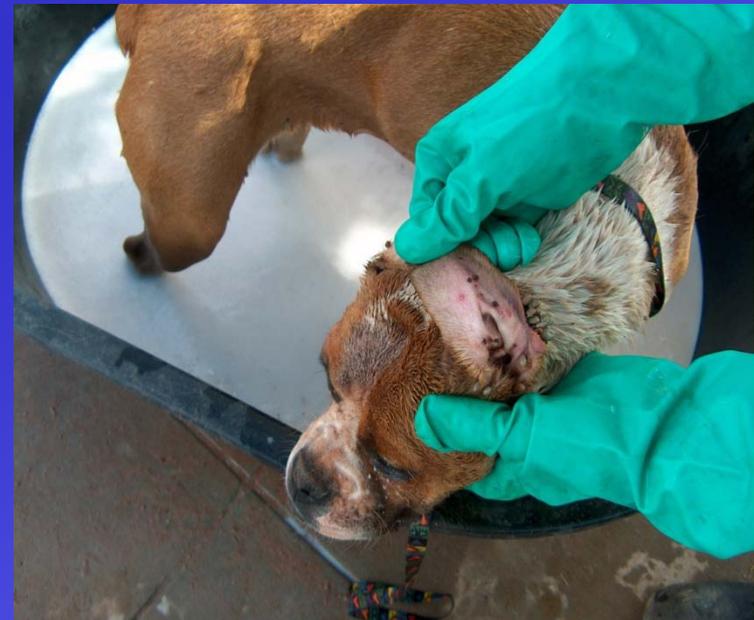


# Vector-Borne Disease Update

- West Nile Virus
- Brucellosis
- Rabies
- CO Tick Fever
- Tularemia
- Swimmers Itch

Craig Levy  
(602) 364-4562

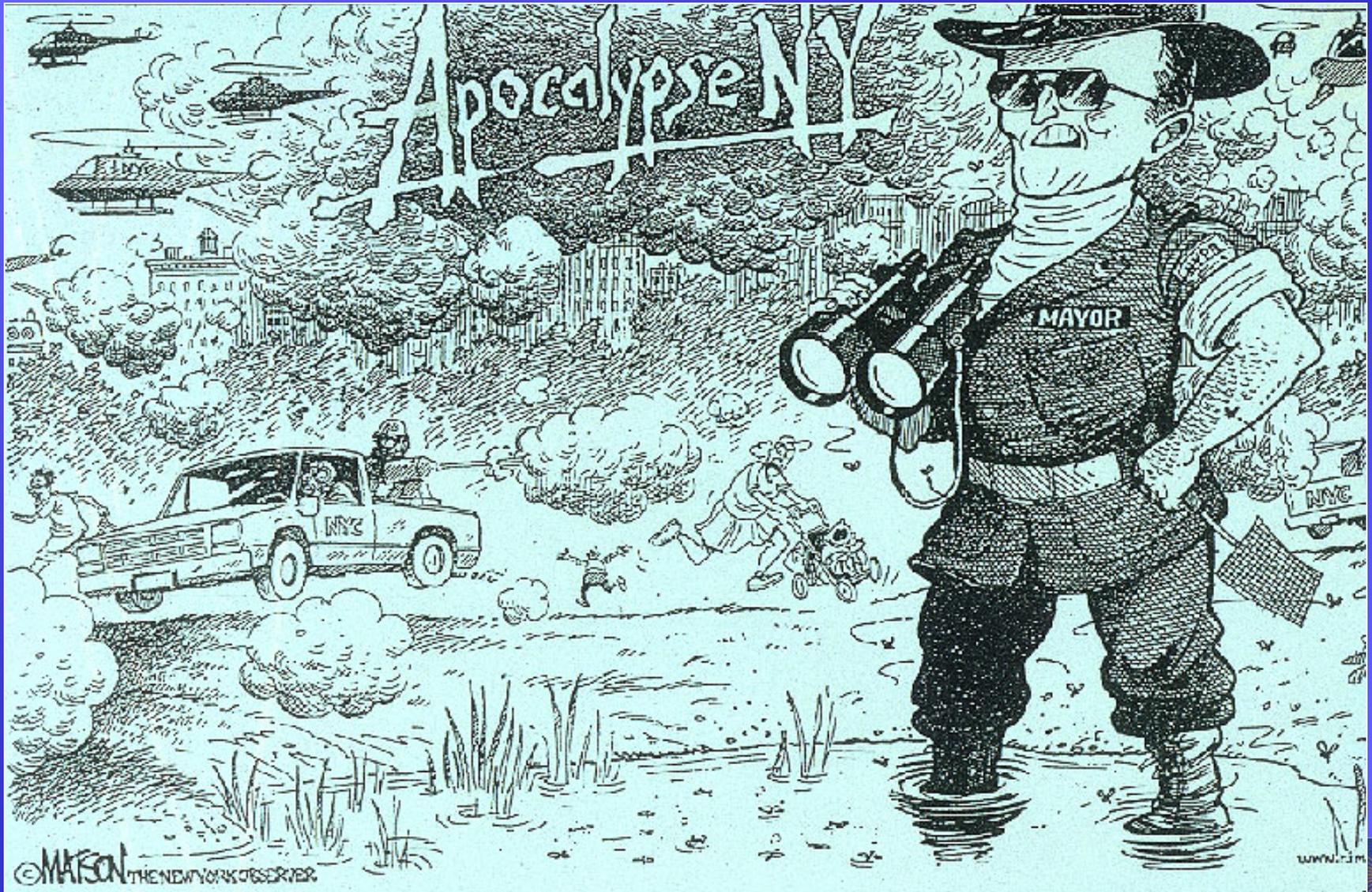


# West Nile Virus Update



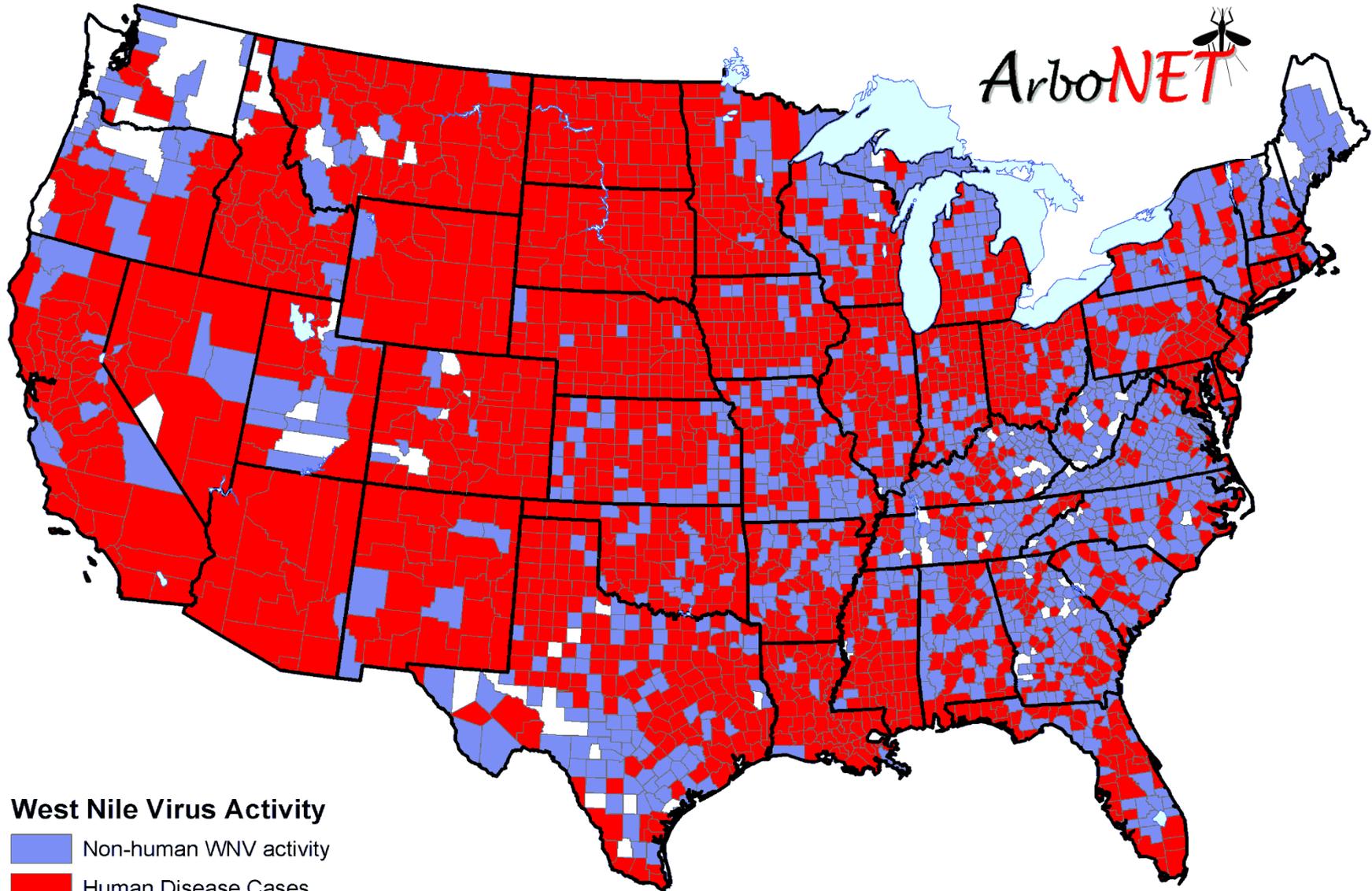
Vector

# West Nile Virus: 11+ Years Later



# WNV Surveillance Totals, U.S., 1999-2008

- WNV human cases, total .....28,900+
- WNV assoc. human deaths.....1,100+
- WNV+ mosquito pools .....65,130+
- WNV+ animals .....25,290+
- WNV+ dead birds .....62,690+
- WNV+ # bird species.....300+
- WNV+ sentinel animals.....9,700+



# West Nile Virus Activity: 1999-2008

# WNV, U.S., 2009

- Total: 720      Fatal: 32
- Neuroinvasive: 386 (54%)
  - - Encephalitis – 229
  - - Meningitis – 117
  - - Acute flaccid paralysis - 40
- Fever / Other: 334 (46%)
- Age Range: 2 – 91 yrs; Median: 60
- Viremic Donors: 116 (23% dvp sx)

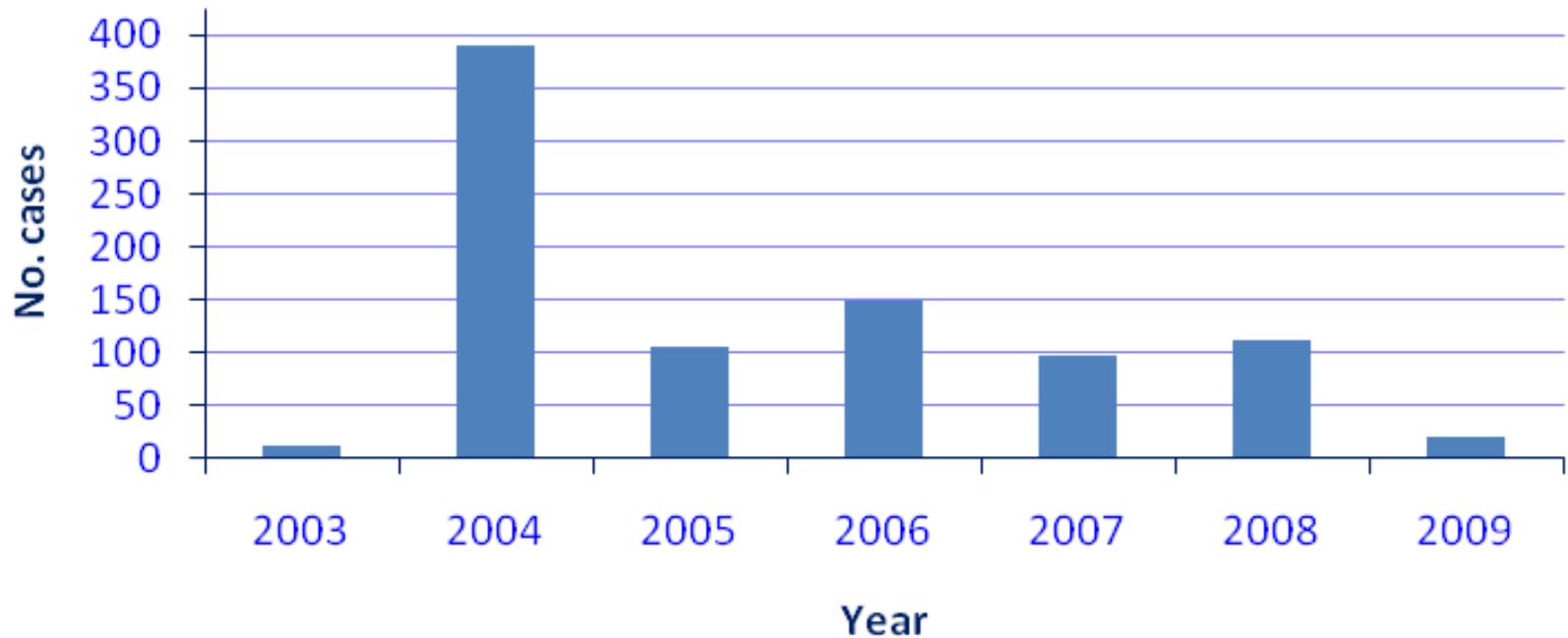
# WNV Infections, U.S., 2009

- For every case of neuroinvasive WNV, there 140 infections and 20%+ have sx (mostly “WNV fever”)
- CDC estimates for Year 2009:
  - - 54,000 infections
  - - 10,000 cases w/ clinical sx
- Surveillance only detects 3% of non-neuroinvasive clinical cases.
- Reduced case numbers can be deceiving.

# 2009 – Reduced WNV Activity

- Many states reported ↓WNV activity 2009.
- Lowest WNV stats since 2001.
- 2009 – cool summers reported across U.S.
- High temps accelerate extrinsic incubation period in mosquitoes – ie, shorten time to become infective.

# West Nile virus, Arizona 2003-2009



# WNV, AZ, 2009

- 2009: WNV lowest activity since 2003.
- 20 human cases (vs. 107 in 2008)
- 88 WNV+ mosquito pools (vs. 208 in 2008)
- 2009 – unusually cool summer – thru June.
- 2009 monsoon was a “Non-soon” – rains were late (late August) and scant.
- Don’t assume that WNV is declining!  
(Mother nature is rarely predictable.)

# WNV+ Mosquito Pools by Month

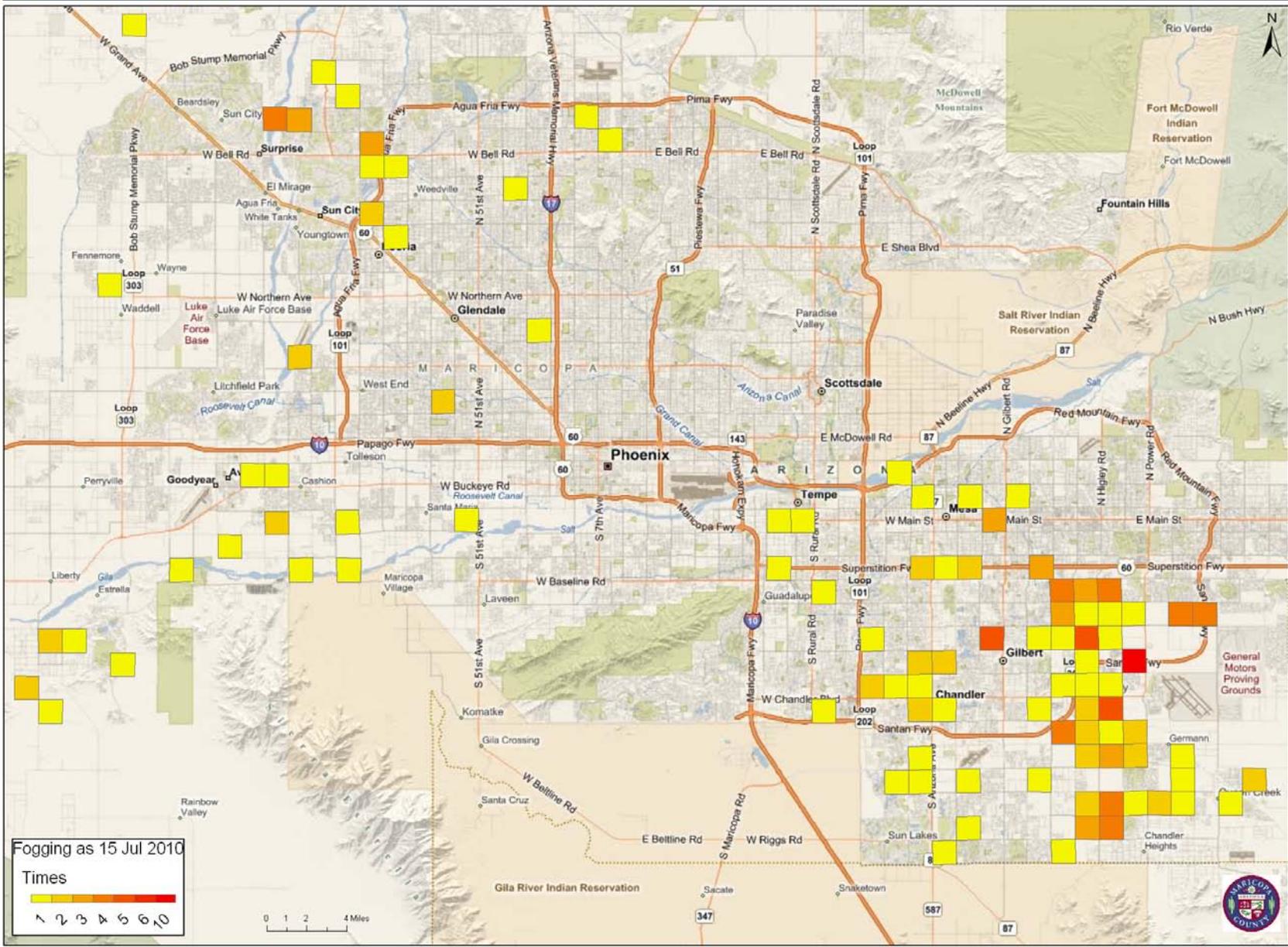
	2008	2009
April	1	0
May	1	3
June	0	23
July	39	34
August	91	12
September	65	9
October	11	7
<b>TOTALS</b>	<b>208</b>	<b>88</b>

# WNV, U.S., 2010

STATE	HUMAN CASES	DEATHS	VIREMIC DNR
Alabama	1		
Arizona	17	1	6
California	2		3
Colorado	3		
Georgia	3		
Kansas	1		
Mississippi	1		
N. Dakota	1		
S. Dakota	1		
Texas			1
<b>TOTAL</b>	<b>30</b>	<b>1</b>	<b>10</b>



# ARBOVIRUS MAP 2010



# WNV Mosquito Surveillance, 2010

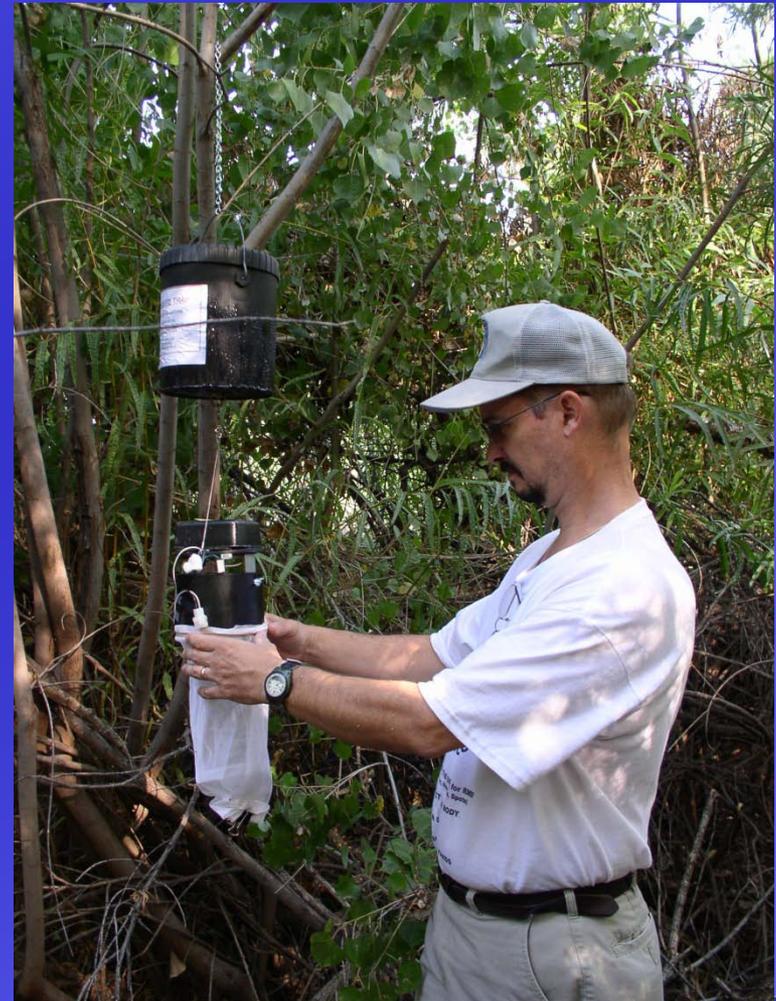
TOTAL : 146 WNV+\*

- MAR – 116
- PINAL – 29
- YUMA – 1

## SPECIES

- Culex quinq. – 89
- Cx. tarsalis – 46
- Cx. sp. -2
- Ae. vexans – 2
- An. franc. – 1

\*(<40 in 2008 & 2009)



# WNV + Mosquito Pools X Year , Mid-July

<b>YEAR</b>	<b># WNV+ MOZZIE POOLS</b>
<b>2005</b>	<b>141</b>
<b>2006</b>	<b>5</b>
<b>2007</b>	<b>65</b>
<b>2008</b>	<b>5</b>
<b>2009</b>	<b>54</b>
<b>2010</b>	<b>130</b>

# WNV: What lies ahead?

- 2010: the worst months are still ahead.
- Monsoon rains might ↑ mosquitoes & WNV
- Expansion of WNV activity = likely.
- Human cases #'s ↑
- 2011: Elimination of Federal Funding
- NPDES



# Brucellosis , AZ- 2010

- Five human cases
- MAR- 3; PIMA-2
- Age: 7- 43; Med – 7
- All Hispanic
- *Brucella melitensis*
- Source: eating unpasteurised dairy – esp. queso fresco (goat cheese – homemade)



# Rabies Update



# Arizona Rabies Stats, 2009

Animal Species	Number Rabid
Bats	69
Skunks	144
Foxes	51
Bobcats	8
Coyotes	2
Horses	3
Cat	1
Other: cow-1,ringtail-1	2
<b>TOTAL</b>	<b>280 New Record!</b>

# Rabies Exposures - 2009

- # human exposures = 44+
- Bats – 12
- Foxes – 8
- Bobcats – 8
- Horses – 6
- Skunks – 6
- Cow – 3
- Cat - 1
- # pet exposures = 166 (mostly dog/skunk)

# Rabies Update 2010 (July 21)

- Current stats – 69 rabid animals
- 49 – skunks
- 4 - bobcats
- 2 – javelina
- 4– fox
- 9 - bats
- 1 – coati
- July 2009 – 160+



# Colorado Tick Fever

## Case History - CTF

- 70+ y.o. male from Yavapai County
- Onset: late June
- Sx: fever 102° F, malaise, loss of appetite
- Labs: leukopenia (low WBCs)
- Adm: hospital – 4 days
- Travel: South Pass, Wyoming – “boggy pasture” – approx. 5-7 days prior to onset.
- Tick attached to leg. ID – *D. andersoni* – blood engorged.

# Colorado Tick Fever



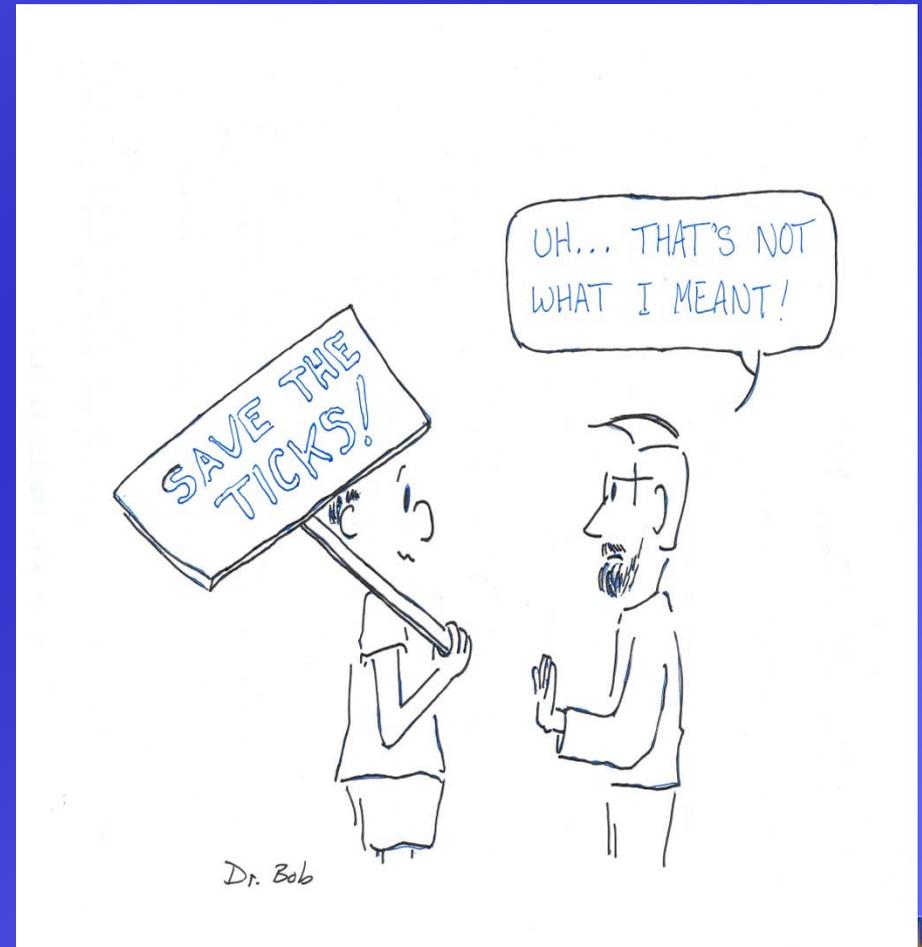
- Agent: *Coltivirus*
- Vector: Rocky Mt Wood Tick (*Dermacentor andersoni*)
- Reservoirs: chipmunks, ground squirrels, porcupine, wild mice & *Dermacentor* ticks
- Occurrence: mountainous regions (>5,000 ft. elev.) in western U.S. & Canada
- Approx. 200+/- cases/year in U.S.

# Colorado Tick Fever

- Incubation: 4 - 5 days after tick-bite
- Clinical: fever, chills, headache, photophobia, often diphasic, transient rash = infrequent, neutropenia & thrombocytopenia on 4<sup>th</sup> day+
- Complications: encephalitis, myocarditis, or bleeding disorders
- Diagnosis: virus isolation or serologic tests (IFA, CF). IgG Ab detected after 10 days
- Treatment: supportive care

# Tick-Borne Disease DX

- Save / submit ticks for ID
- Tick species & patient travel hx will disclose which disease(s) are possible, and will help w/ lab testing & rx decisions.
- Many patients & MDs automatically think Lyme disease.



# Tularemia

- Tularemia dx in cat –  
Yavapai Co. - July
- “Oreo” – outdoor  
hunter – caught a  
rabbit.
- Sx: fever, oral lesions,  
abd. tenderness,  
stopped eating,  
antisocial behavior
- Susp. plague vs. tula
- Specimens → ASHL



# Tularemia Response

## Typical Follow-up by Local Health &/or State

- Contact cat owners, veterinary staff & other persons w/ contact to sick cat
- Consider fever watch or prophylaxis
- Notification of local hospitals / EDs
- Notification of local DVMs
- Notification of Game & Fish
- Local press release
- Notification of local residents

# Swimmer's Itch



# Swimmer's Itch

## a.k.a. Cercarial Dermatitis

- June 2010, suspected cases of SI reported in June in Mohave County in people swimming in coves along the Colorado River.
- SI has been reported in past years in Arizona lakes & ponds, including Roper Lake (Safford) & Coors Lake (Bagdad).
- SI cases occur during warmer months when people are spending more time in water.

# What is Swimmer's Itch

- Swimmer's itch (SI) is caused by a schistosome (blood fluke) that affects mostly waterfowl.
- SI affects people wading or swimming in natural bodies of water – especially shallow areas of ponds, river coves, lakes, etc. where aquatic vegetation, snails & waterfowl occur.
- Human's are a dead-end host.
- An immature stage of the fluke – called cercaria – attempt to burrow into skin causing tingling, itching, burning or “electrical” sensation.



# Swimmer's Itch

- Cercaria - an immature stage - penetrate outer layers of skin and then die.
- Itchy lesions develop – people react to different degrees.
- People with previous exposure are sensitized & tend to react quicker and more intensely.



# Swimmer's Itch Life Cycle

