



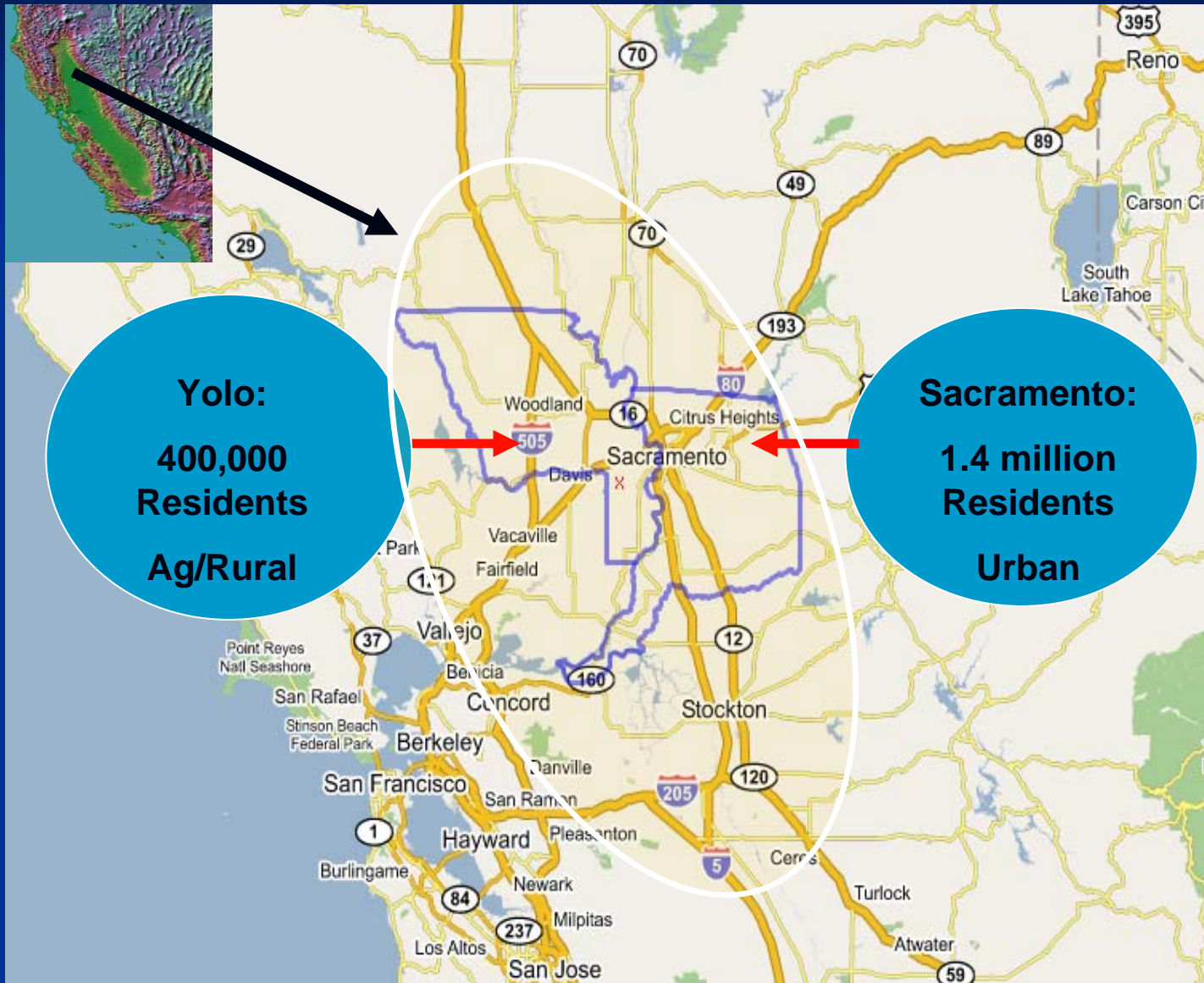
West Nile Virus Surveillance and Control in the SYMVCD

David Brown¹, Dia-Eldin Elnaeim¹,
and Ryan Carney²

¹Sacramento-Yolo Mosquito and Vector Control District

²California Department of Health Services

Sacramento and Yolo Counties



District Developed WNV Response Plan

- Updated plan with Board of Directors January-March 2005
- Utilized California Mosquito-Borne Virus Surveillance and Response Plan and CDC Guidelines
- Five Levels of Control
 - Level 1 - Basic Level
 - Level 2 - Mosquito Pool/dead bird
 - Level 3 - Animal/Chicken
 - Level 4 - Human case
 - Level 5 - Epidemic conditions

Basic Level of Mosquito Management Measures

- Thresholds are
 - 100 mosquitoes in MMT/ EVS per trap night or
 - 25 mosquitoes in Light /Gravid per trap night
- Source Reduction/ Water Management
- Biological Control
- Larvicide (immature mosquito) control
- Adulticide (mature mosquito) control in Rural/Agricultural/open space areas
- Education

When Response Plan Triggered

- Mosquito Abundance Thresholds are Lowered and District Response Increases
- Lab staff determines scope of infections
- Control operations maximize larval control
 - Immediate treatment of all larval sources
 - Localized Treatment for adult control
- Immediate Press Releases to inform public

WNV Mosquitoes of Concern



Flight Range

Cx. pipiens ~1 mile

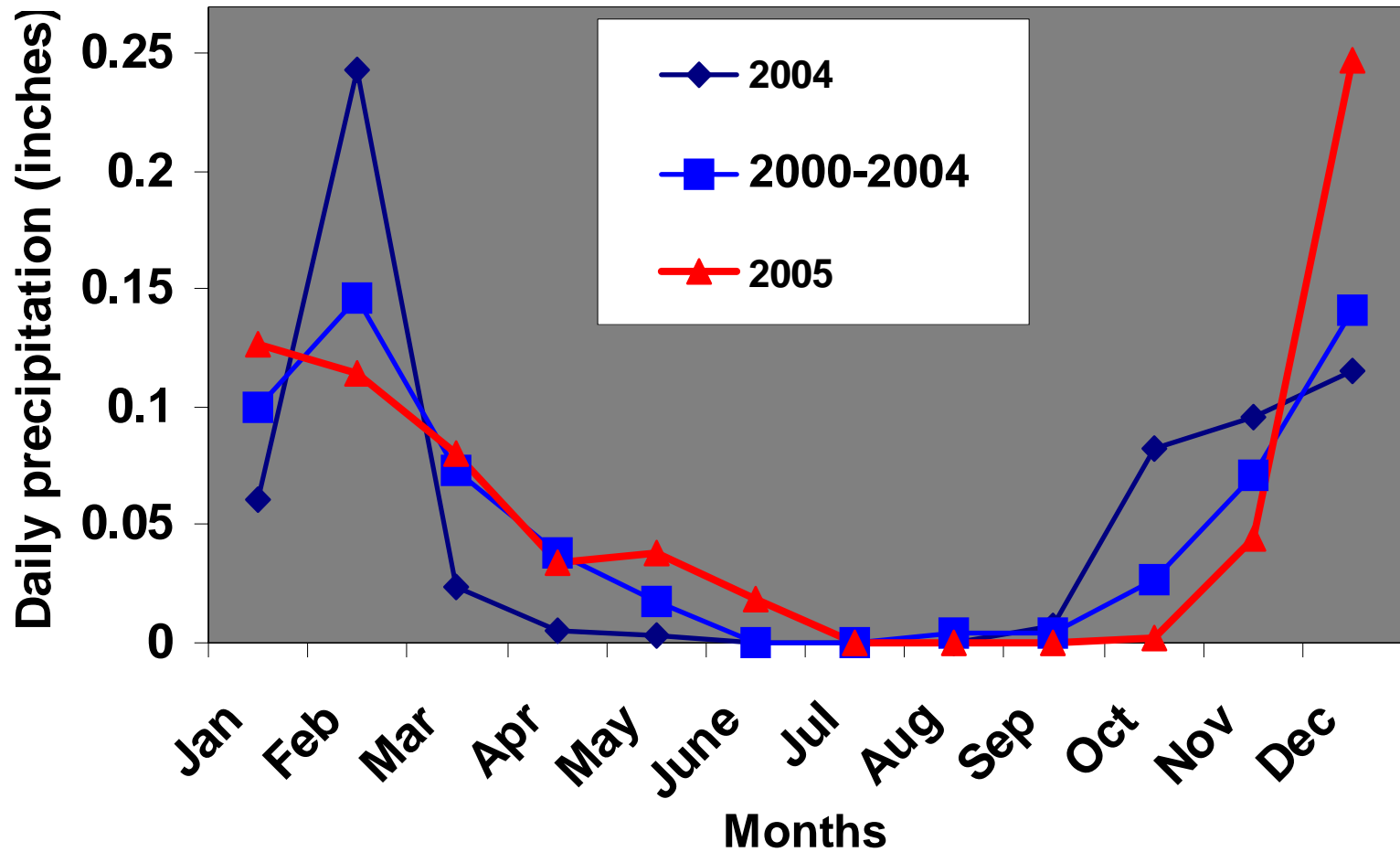
Cx. tarsalis ~ 5 miles

- 2 species very efficient
- *Culex tarsalis*
 - Agriculture
 - Natural Sources
 - Urban
- *Culex pipiens*
 - Urban sources
 - Dairy/Rural

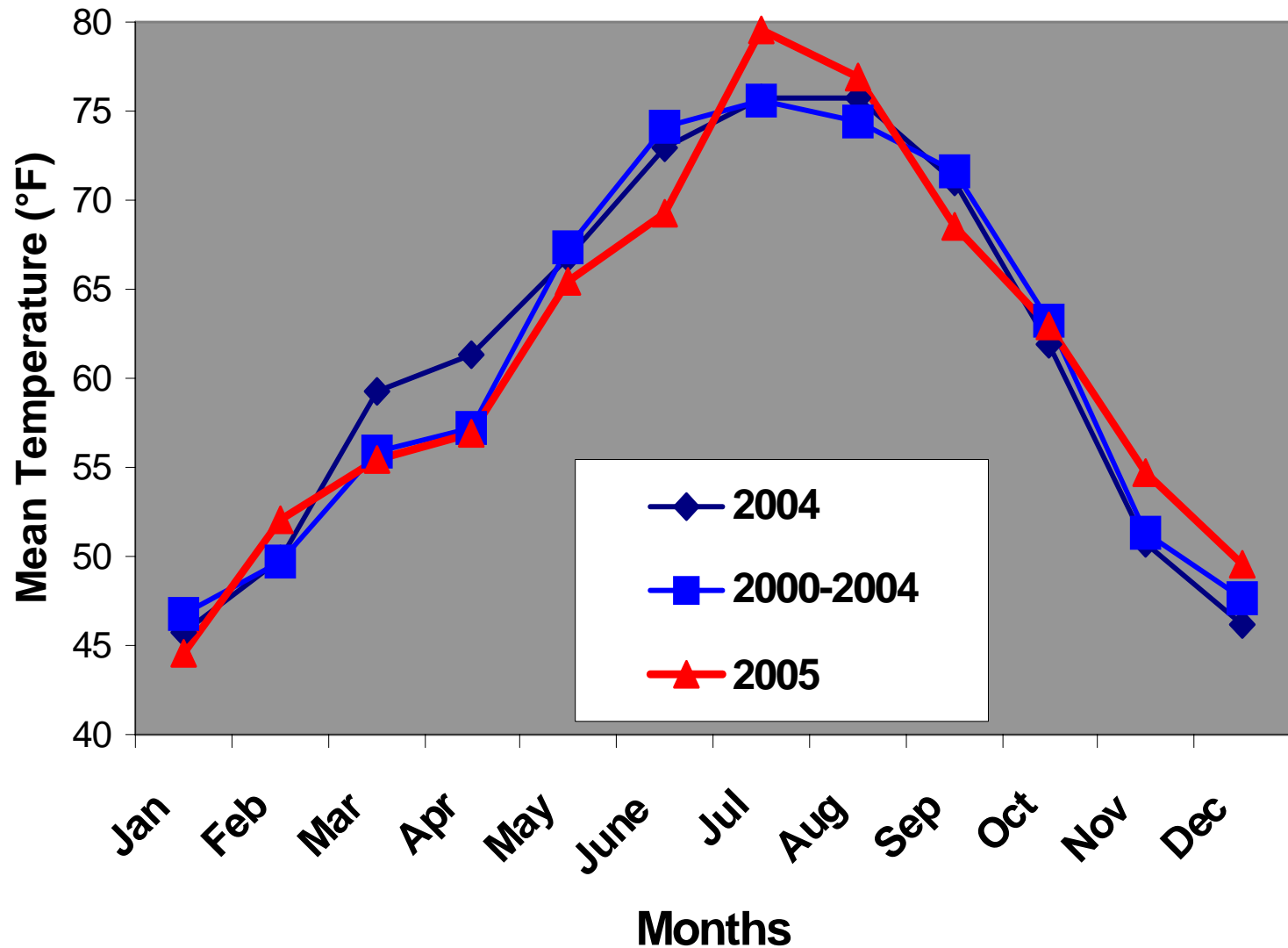
2005 Sequence of Events

- By February, already at level 2 (Dead Birds)
- Above Average Rainfall (Through June)
- Followed by Above Average Temperatures (record July)

Precipitation Records: Sacramento-Yolo Counties 2000-2005



Temperature Records: Sacramento-Yolo Counties 2000-2005

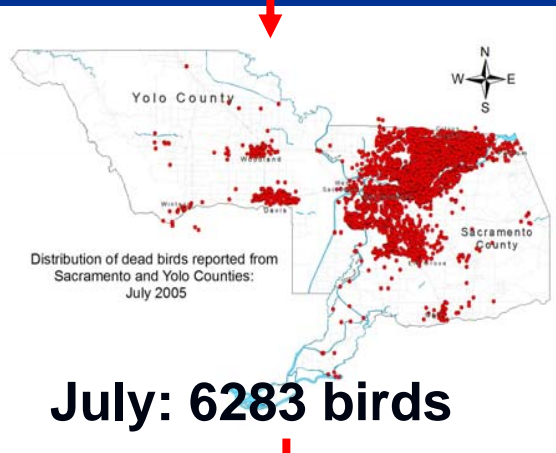
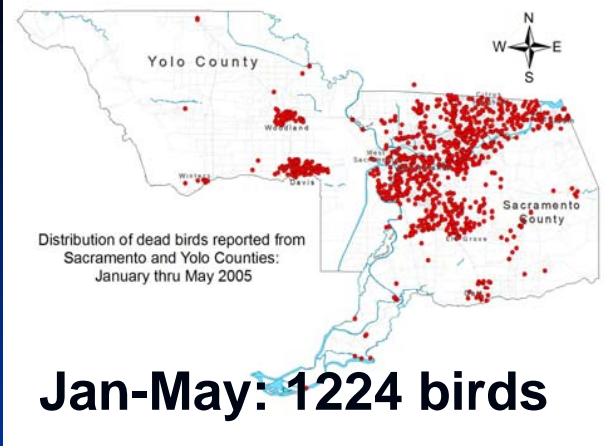
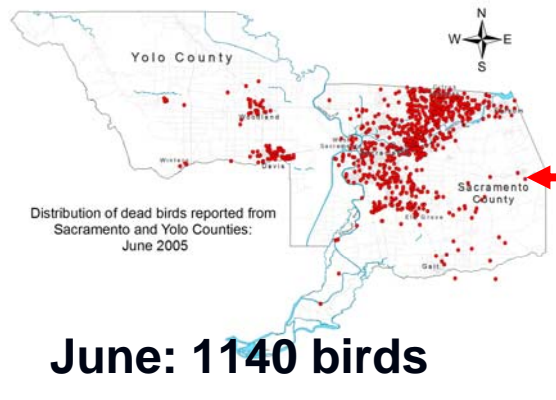


Enhanced Larval Control in Entire Area

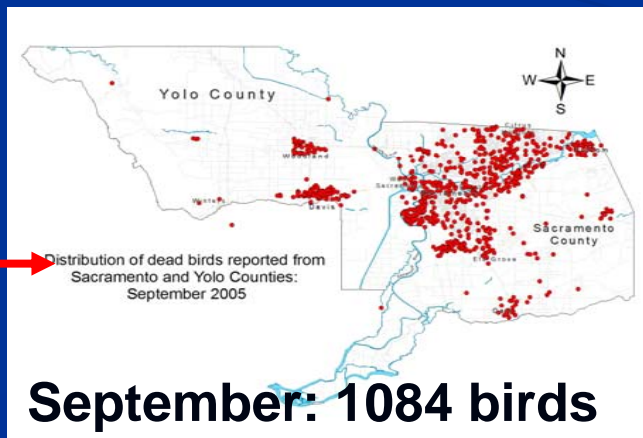
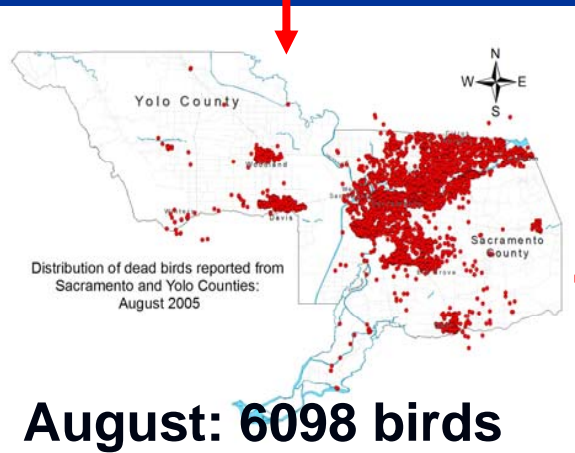
- Performed when dip counts exceed 0.1 larvae
- Bti / Bs
- Insect growth regulators
- Light film oils
- 60,000+ treatments to date in District
 - 10 additional Technicians (Swat Team) hired to perform control

2005 Sequence of Events, Cont.

- June 29th infected mosquito pools
- July 15th infected Sentinel Chickens
- July 21st report of human infection in Sacramento County
- Media Announcements made at each event
- July 27th CCC hired to go door-to-door to inform residents of localized adult control

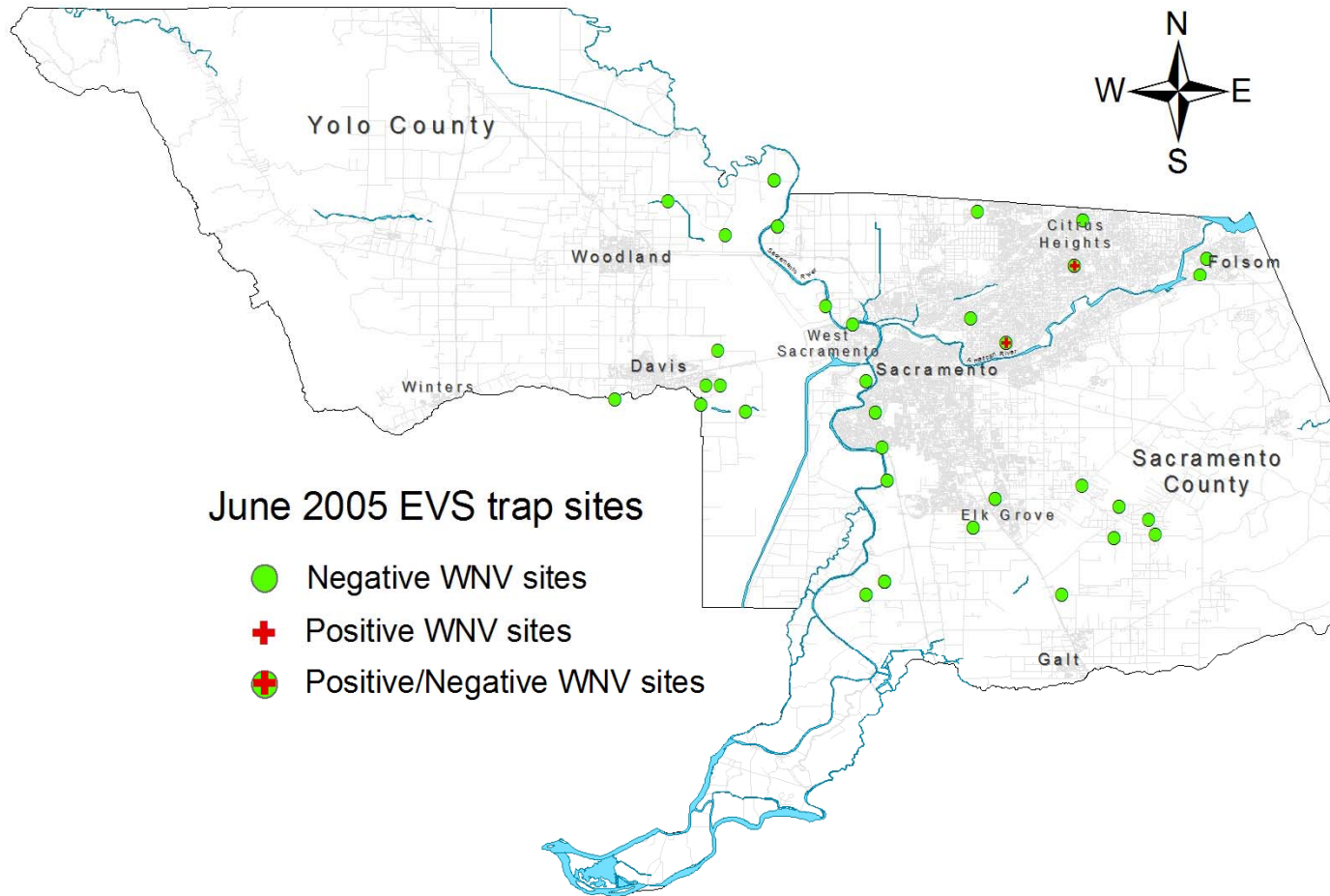


46% (78/168) of submitted dead birds were WNV +ve

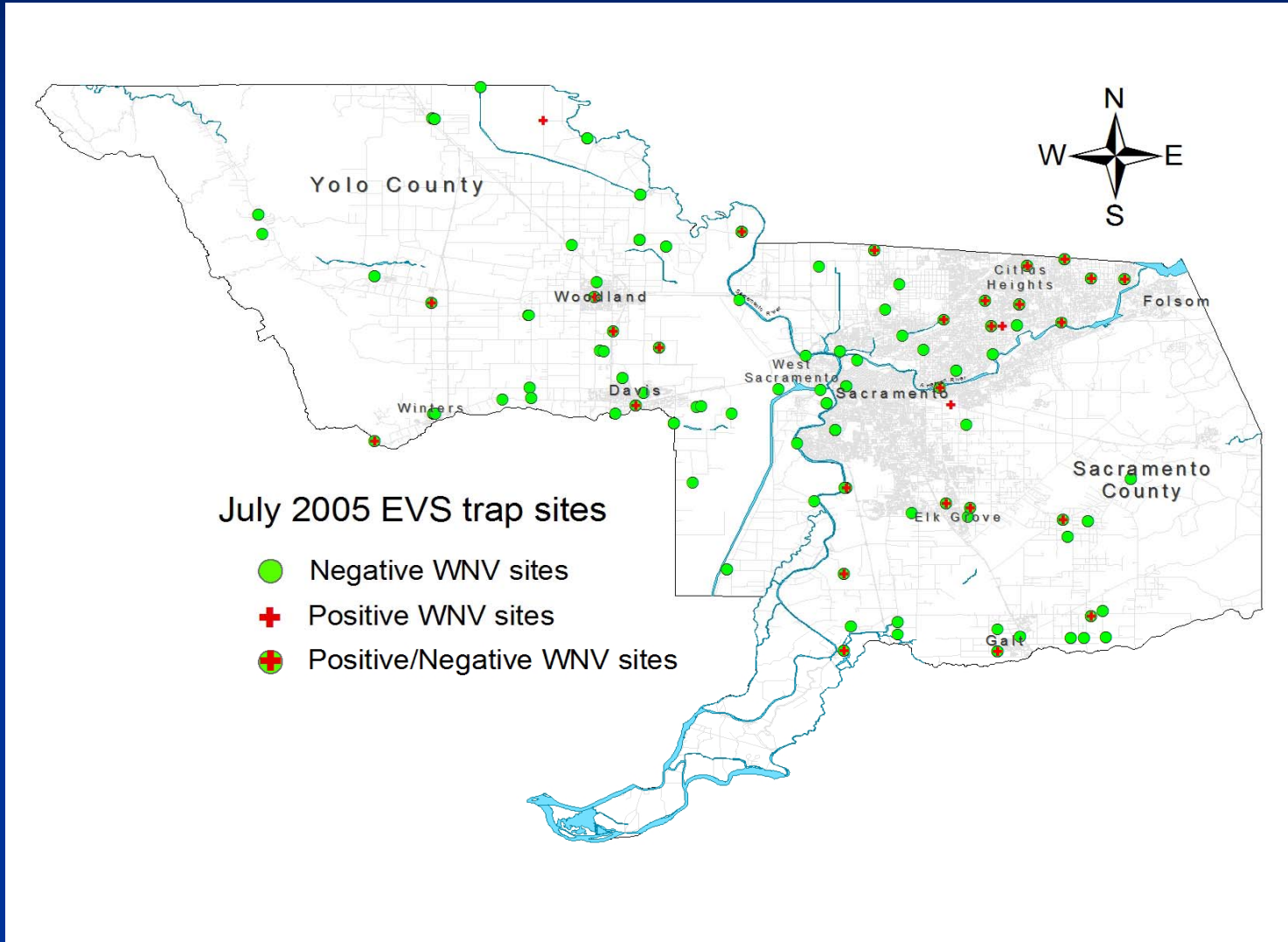


The 2005 Sac-Yolo Counties Monthly Dead Birds Reports

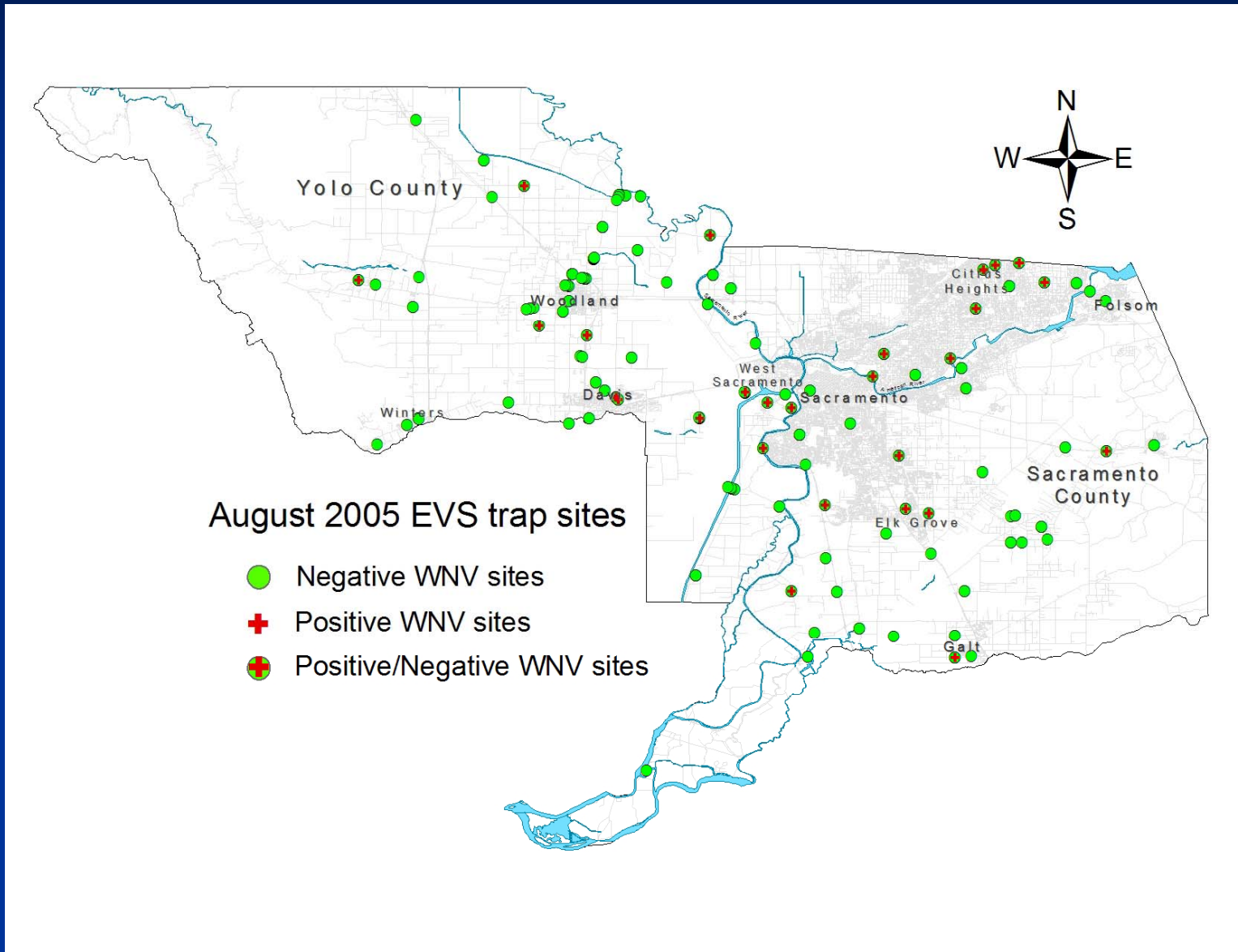
WNV positive and and negative mosquito pools in June 2005: 4 +ve and 109 -ve



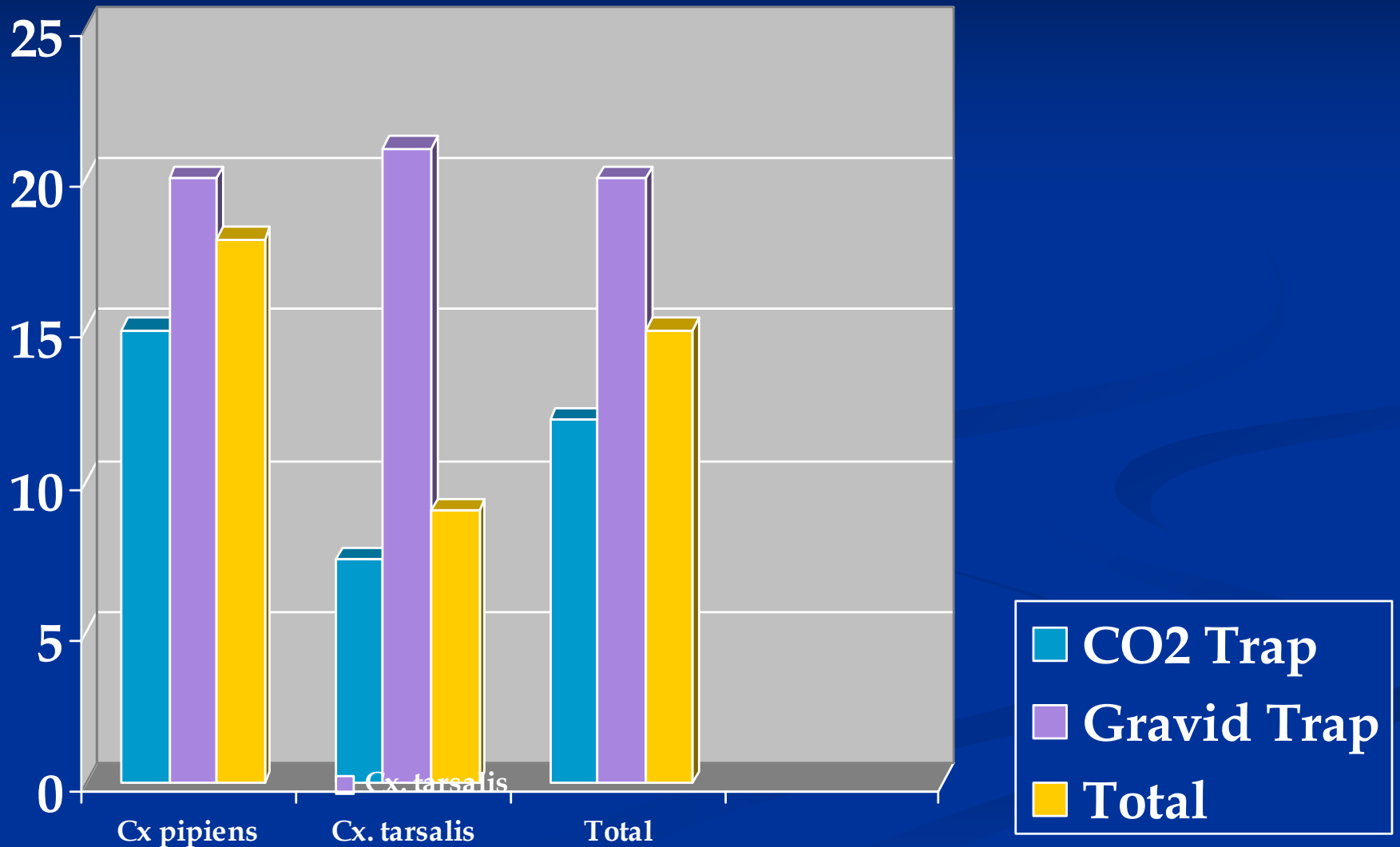
WNV positive and negative mosquito pools in July 2005: 70 +ve and 310 -ve



WNV positive and negative mosquito pools in August 2005: 53+ve and 503 -ve



Sacramento Mosquito Minimum Infection Rates (Late July- Early August)

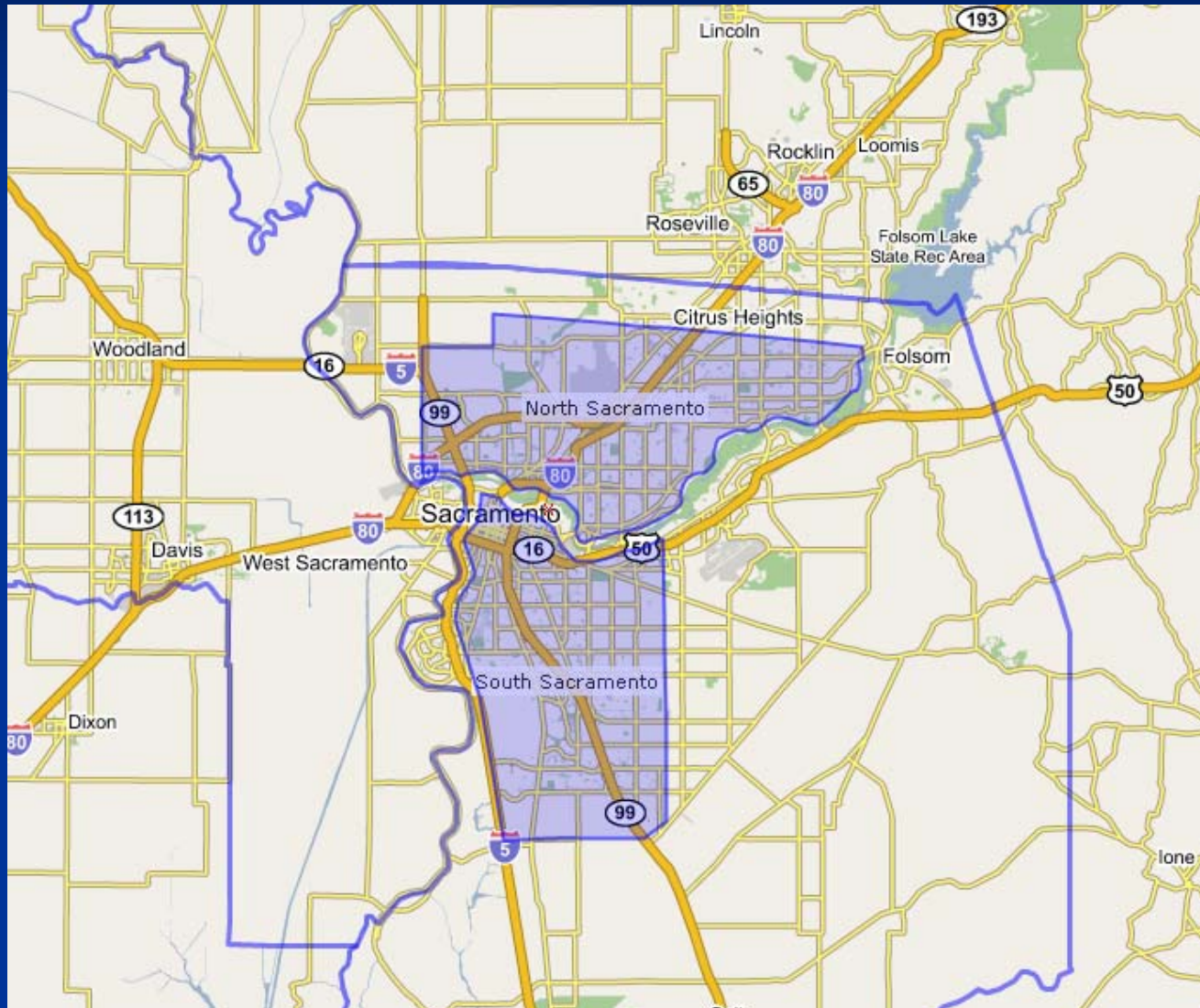


Aerial Adult Mosquito Control initiated



- Decision made August 4 to treat 50,000 acres North of American River August 8 (3x)
- 70,000 acres south to follow August 11 (3x)*
 - 21, 22, 23
- Pyrethrin/PBO product selected at 0.66 oz. per acre
- 330,000 acres=\$666,000

Aerial Spraying zones in North and South Sacramento



W. Nile spravin

Officials say it's safe, but pu

County to fight W. Nile by air

71,000 acres north of American River will be sprayed Monday.

W. Nile forum frayed is faulted

The disrupted meeting was a lost chance to inform Davis residents, official says.

By Hudson Sangree and Carrie Peyton Dahlberg

Delta breeze delays W. Nile

begin

widespread

Pesticide specialist Eric S...

...make sure the formula is correct for Monday's spr...

Sacramento Bee/José Luis Villagran
county was said to carry West Nile virus.

► SPRAYING, Page

Held Town Hall Meetings

Ranging from mild protest.....



....to overall acceptance



Even Spent a day in Court!



Judge Lawrence Karlton

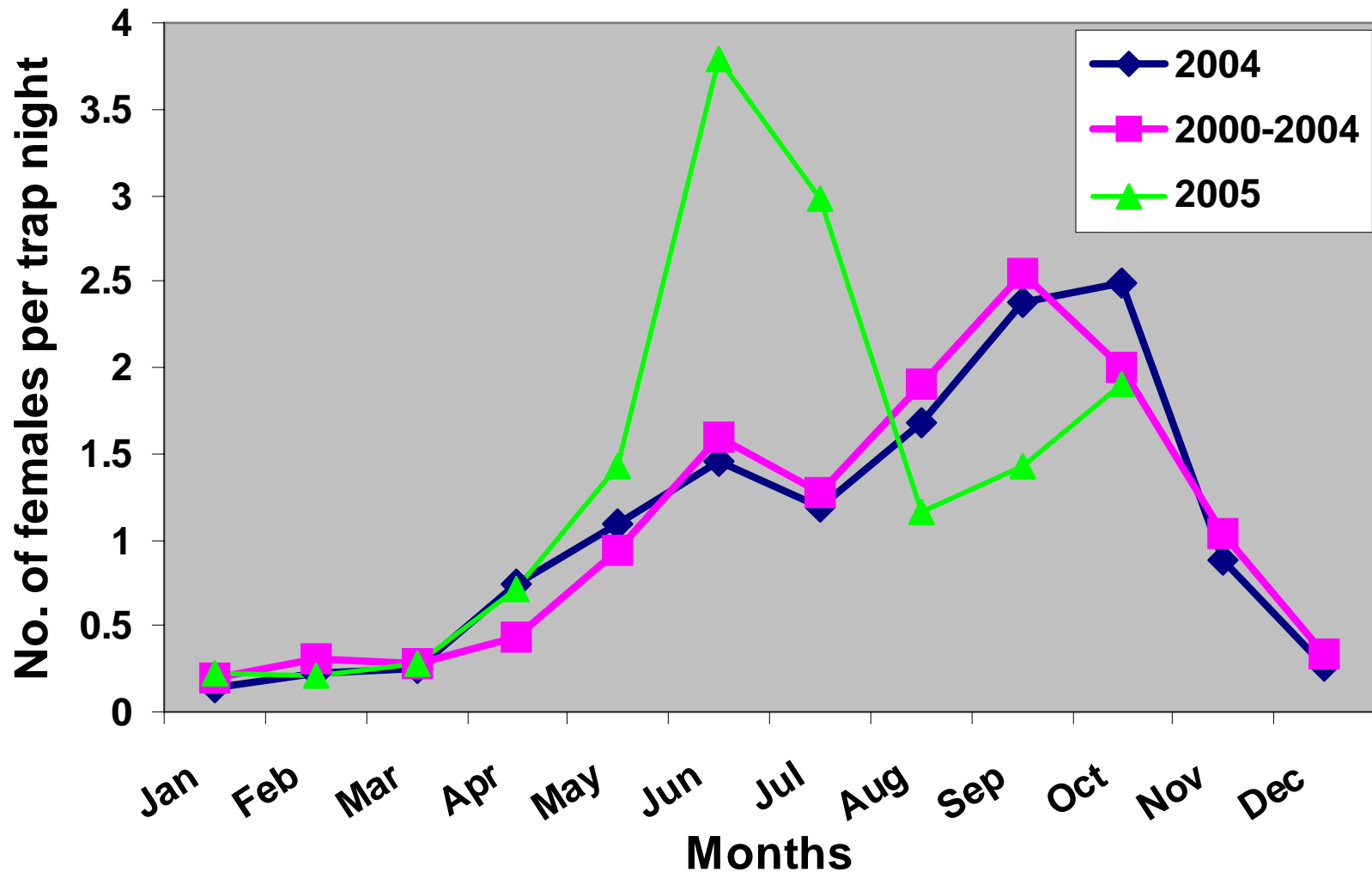
Started to treat August 8th,
Sued on August 9th for
Alleged violations of the
Clean Water Act

Restraining order denied

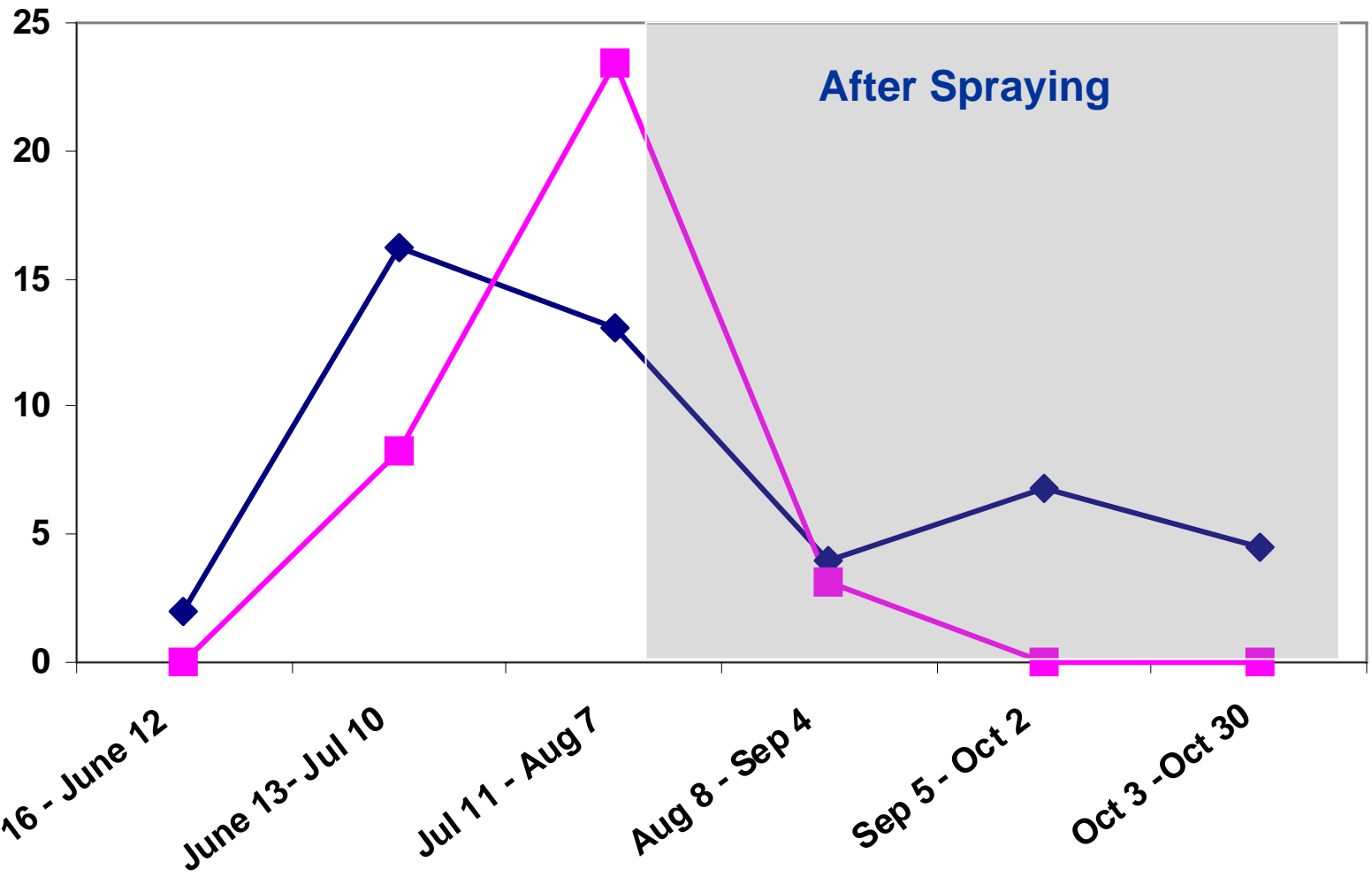
Results

- Significant reduction in Mosquitoes and WNV Infection in North Sacramento County
 - Post trap counts showed a dramatic reduction of mosquito population and elimination of WNV infection

American Light Trap collection of *Culex pipiens* in Sacramento-Yolo Counties, 2000-2005



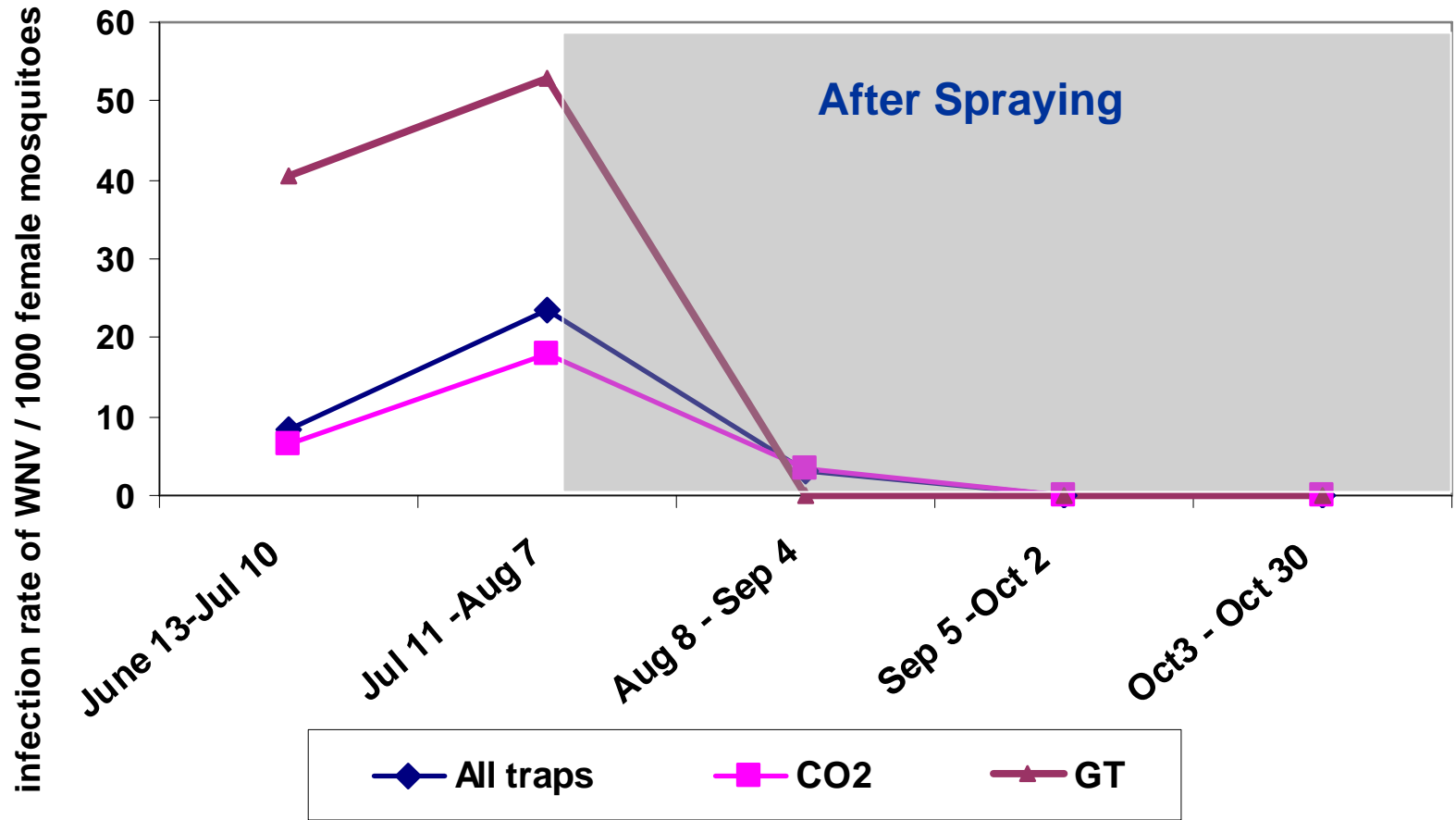
Effects of aerial spraying of pyrethrin insecticide on numbers of *Culex* mosquitoes and their infection rates with WNV, in North Sacramento (June – Oct 2005)



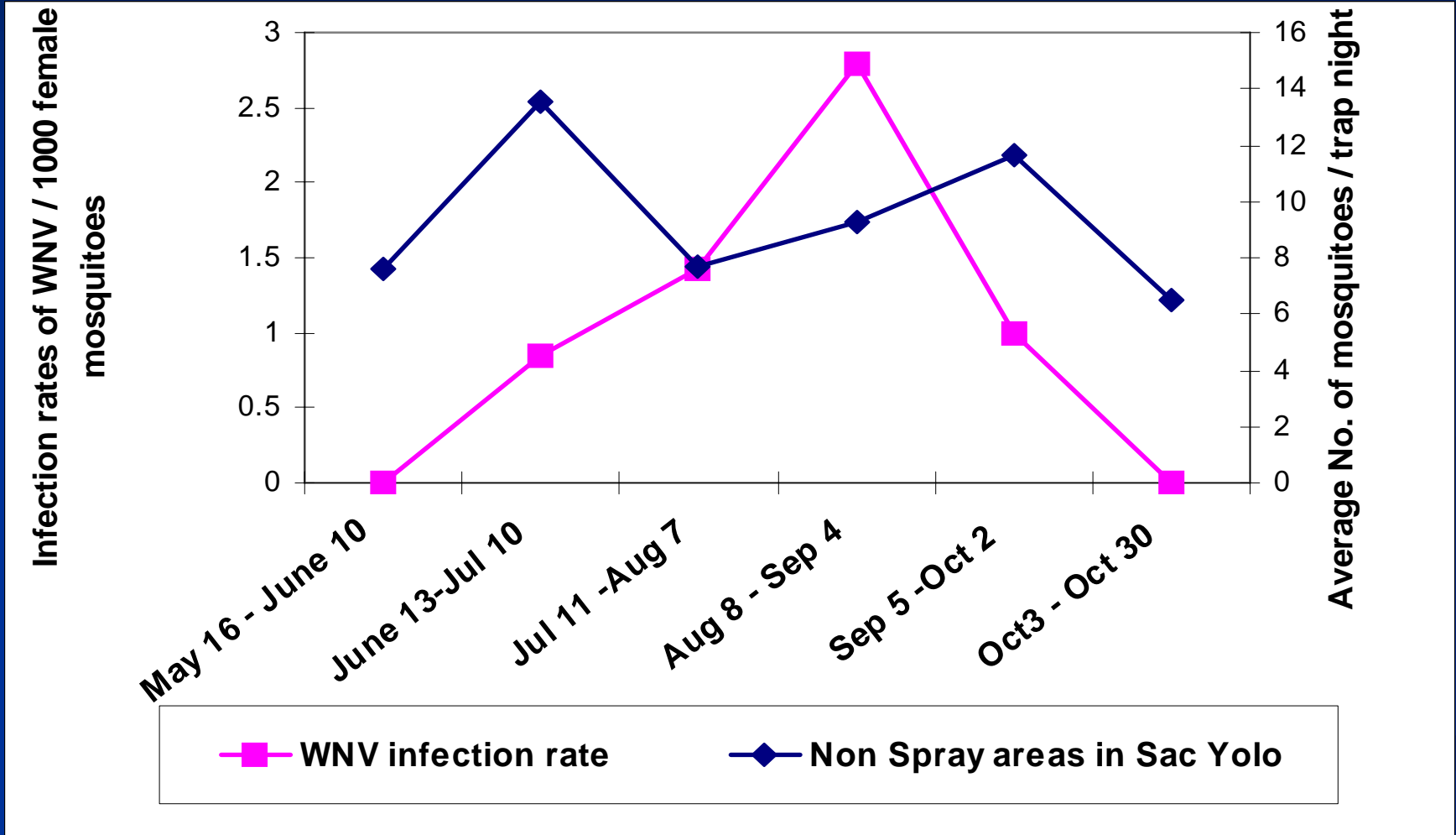
◆ Number of mosquitoes / trap night

■ WNV infection rate / 1000 female mosquitoes

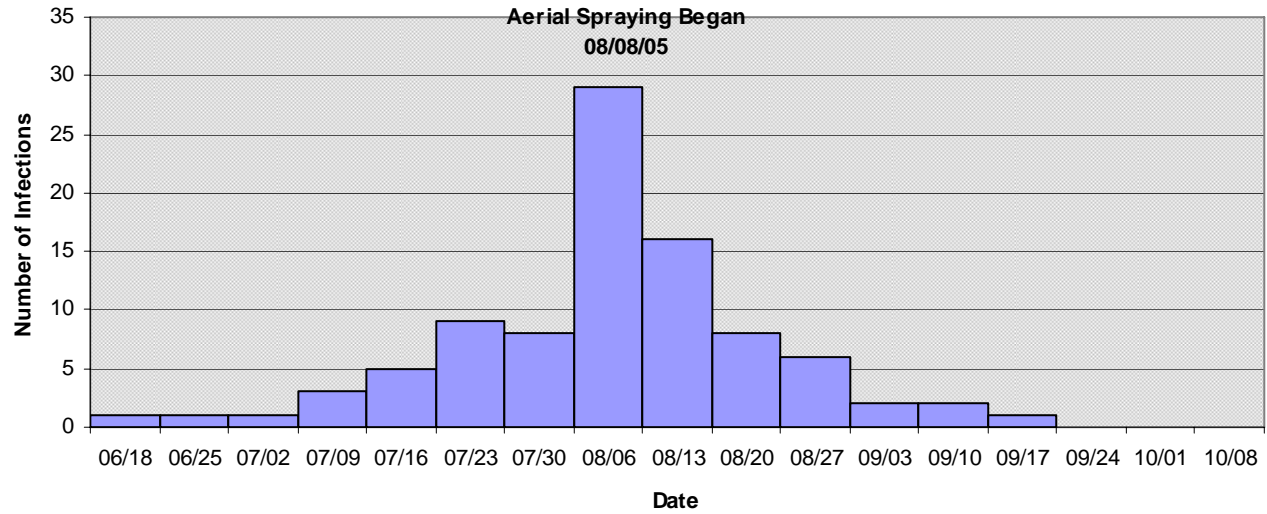
WNV infection rates in *Culex* mosquitoes collected in North Sacramento before and after aerial spraying with pyrethrin insecticide



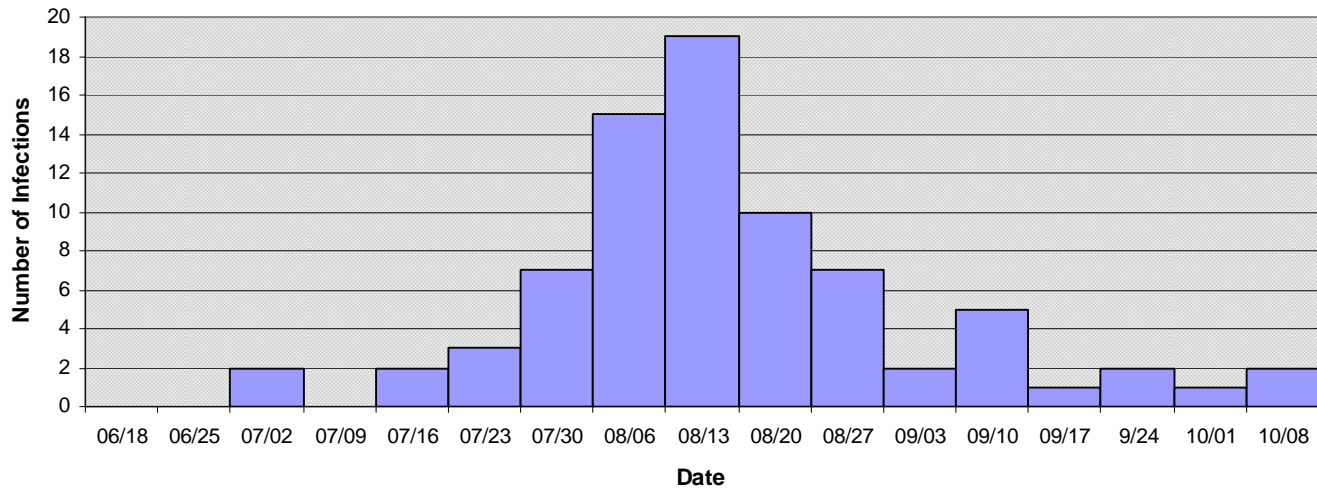
Fluctuations of mosquito densities and their infection rates with WNV in Non-Sprayed areas in Sacramento and Yolo Counties, during June-Oct 2005



**WNV Symptomatic Infections and Positive Blood Donors by Week of Onset (North of American River)
Sacramento County 2005**



**WNV Symptomatic Infections and Positive Blood Donors by Week of Onset (South of American River)
Sacramento County 2005**



62:

Utilizing the spatiotemporal DYCAST system to predict human West Nile virus cases in California and to evaluate the efficacy of aerial adulticiding within Sacramento County, 2005

Ryan M. Carney

*WNV Dead Bird Surveillance
Program Coordinator*

California Dept. of Health Services

rcarney@dhs.ca.gov

510 412-6254 phone

510 412-6263 fax

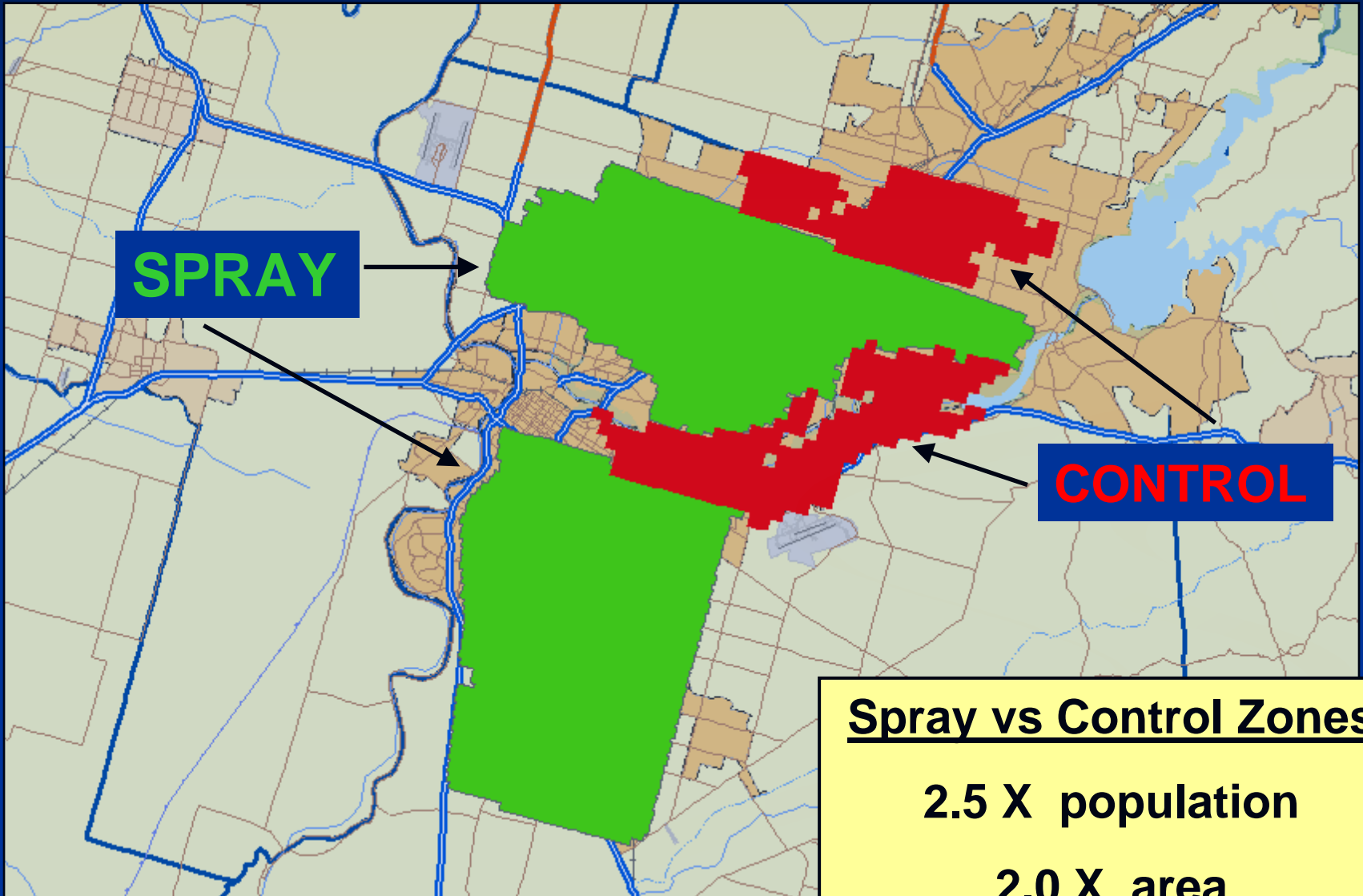
HOTLINE: 1-877-WNV-BIRD

WEBSITE: westnile.ca.gov

DHS Analysis of Spray Efficacy on Human WNV Case Reduction

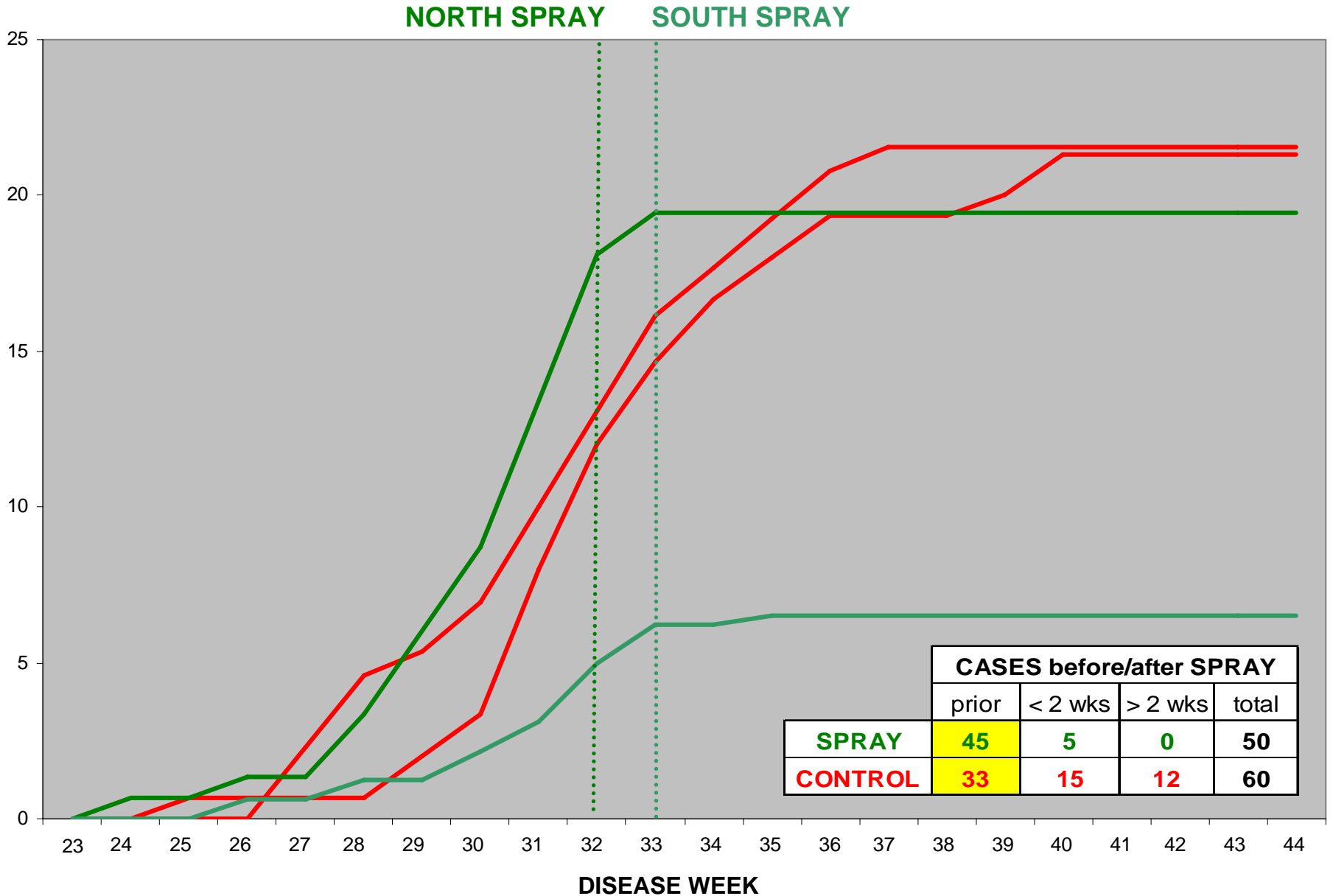
- Contiguous non-sprayed (“control”) areas were defined around the spray zones that were similar demographically and epidemiologically:
 1. Census 2000 data layer: Housing Density Classes 9-10
 2. Both sprayed and non-sprayed areas had to have a similar number of human cases *before* the spraying took place
 3. Epidemiological congruency was further tested through analysis of localized D.Y.C.A.S.T. risk profiles

Aerial Spray versus “Control” Zones

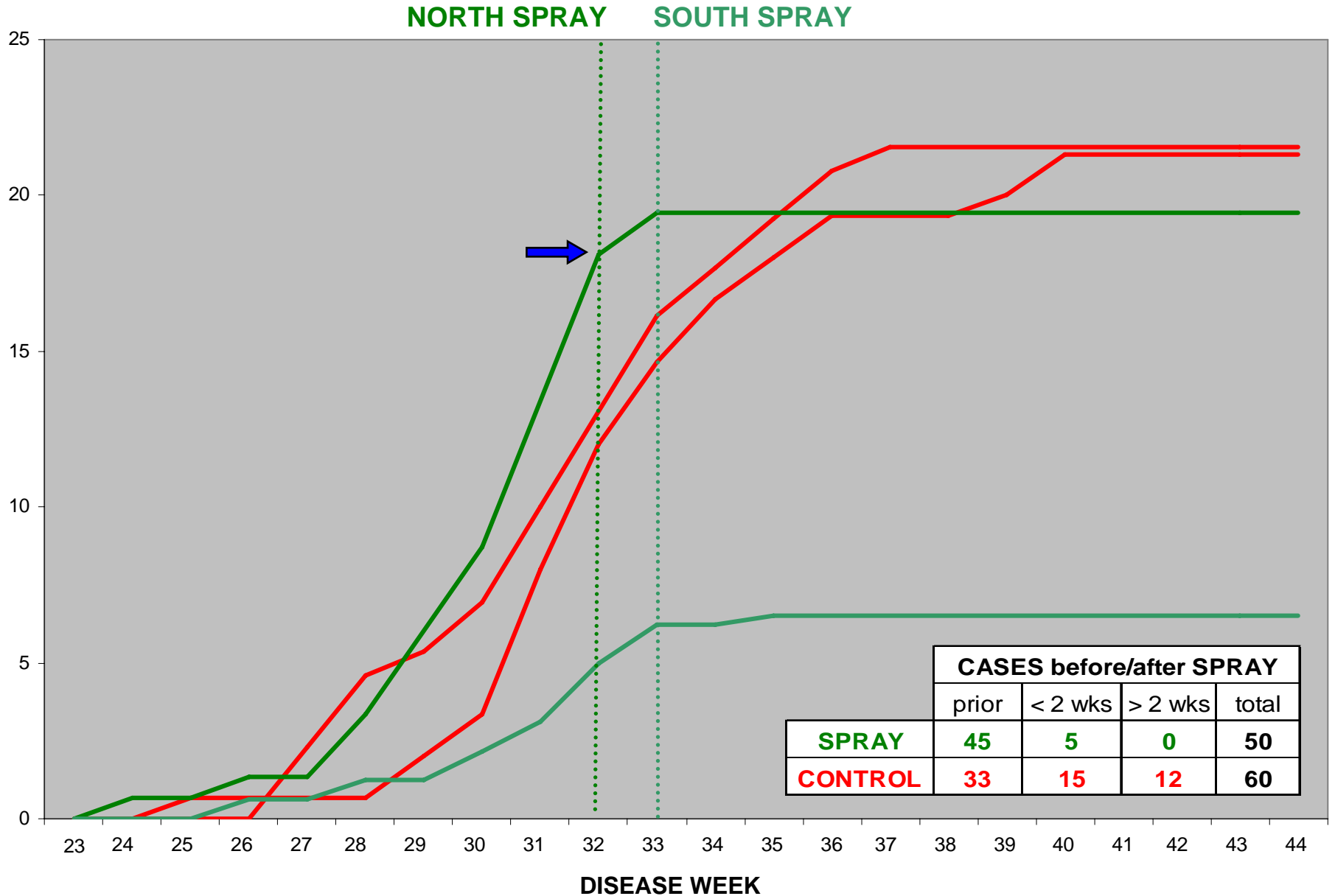


Spray vs Control Zones
2.5 X population
2.0 X area

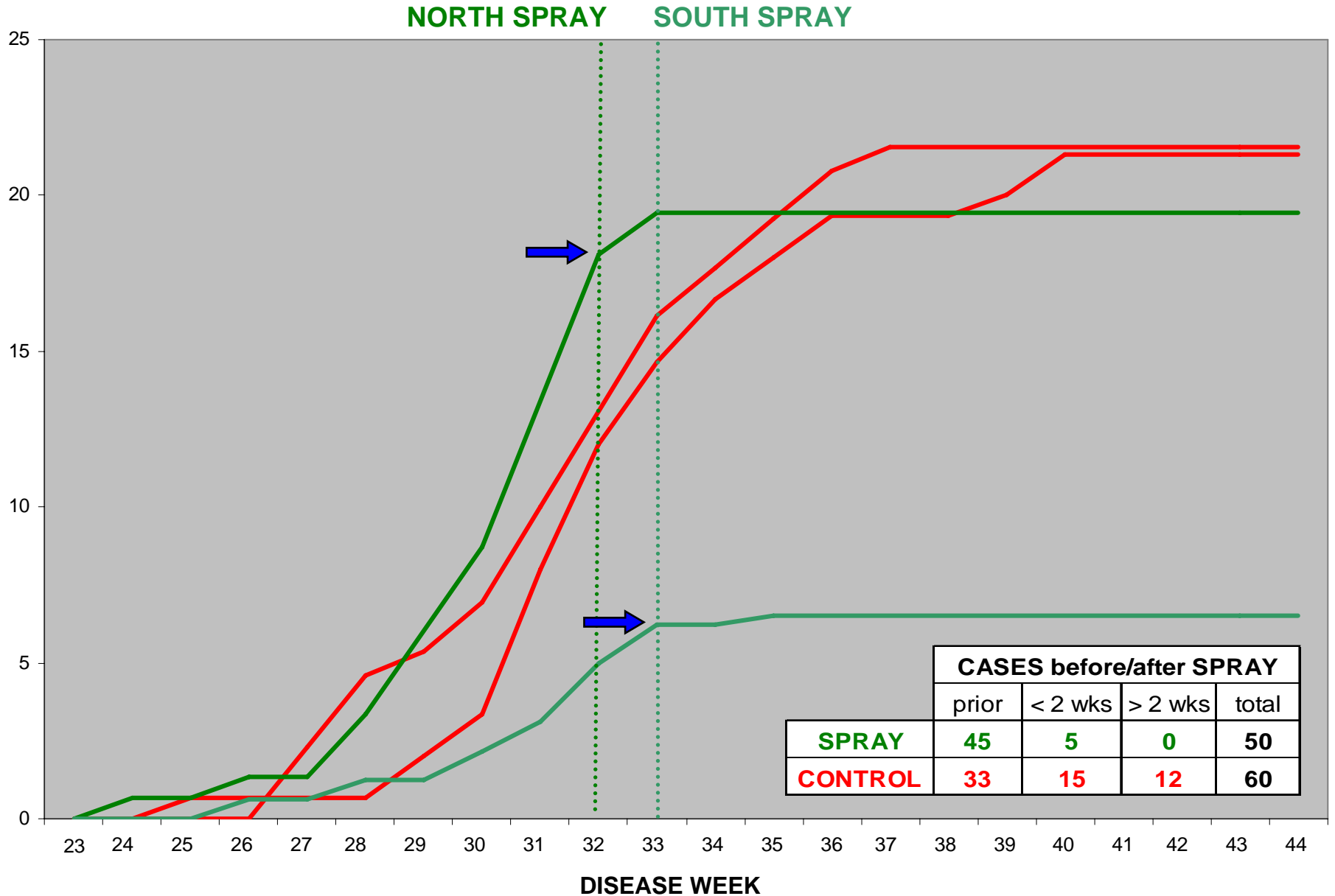
WNV Incidence (per 100,000) within Sac Co Study Areas, 2005



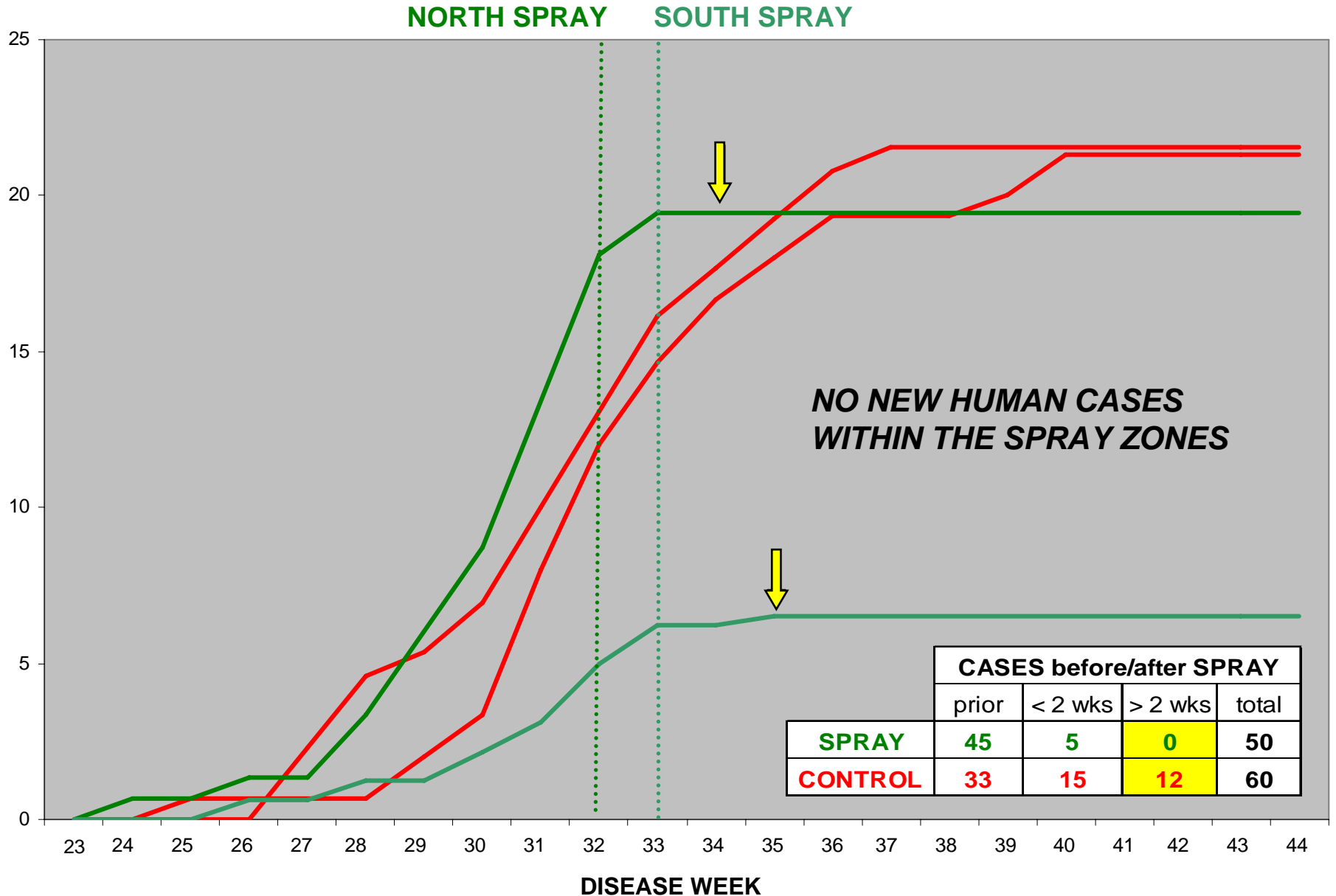
WNV Incidence (per 100,000) within Sac Co Study Areas, 2005



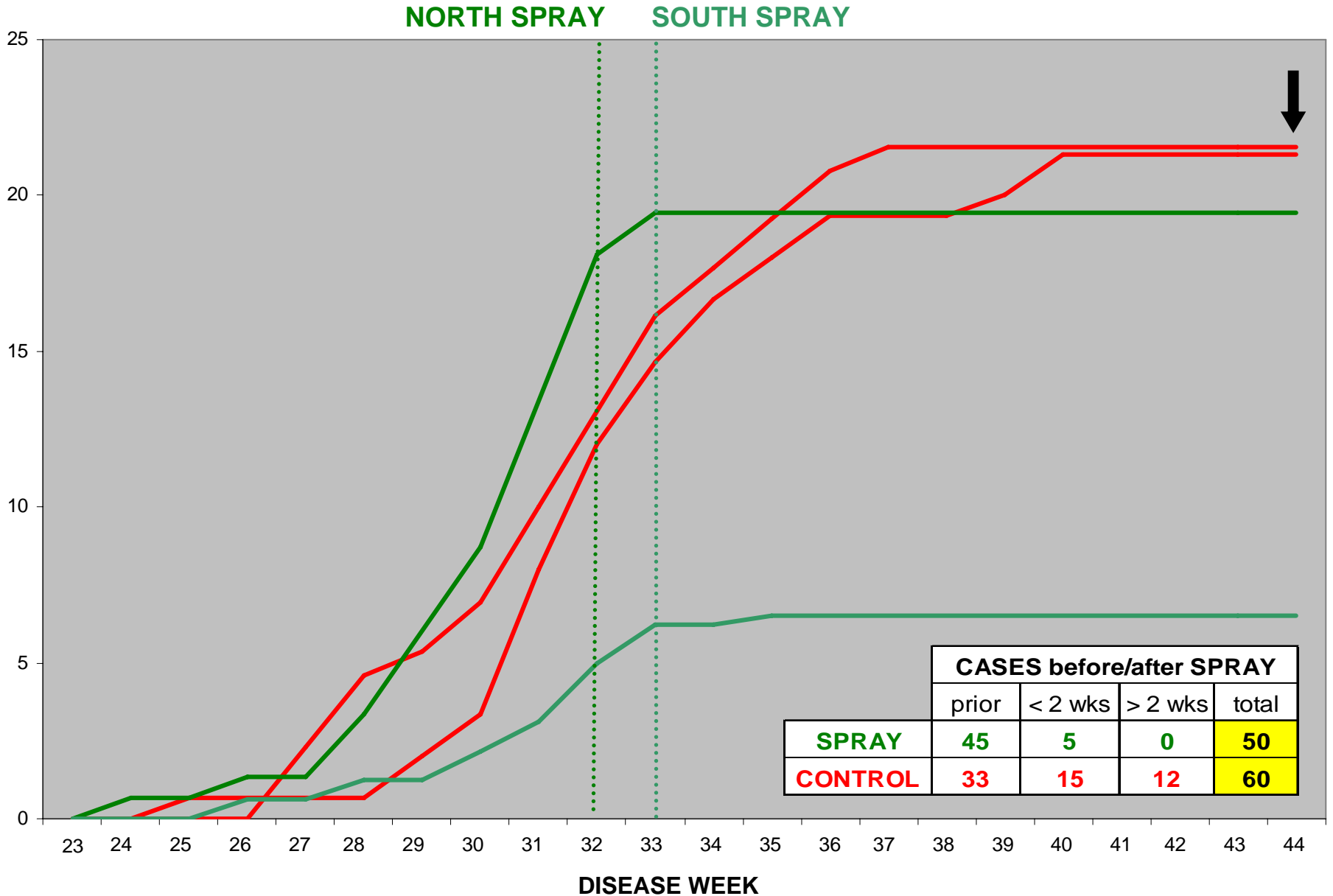
WNV Incidence (per 100,000) within Sac Co Study Areas, 2005



WNV Incidence (per 100,000) within Sac Co Study Areas, 2005



WNV Incidence (per 100,000) within Sac Co Study Areas, 2005



Treatments Were Successful, but There Are Issues To Address

■ CURE WORSE THAN DISEASE

- PBO listed as “possible cancer causing agent”
- WNV not that serious of a disease
- “Disease affects only those over 50....they do not reproduce nor are they long for the world anyway”

Further Information

- www.fightthebite.net
- 1-800-429-1022