



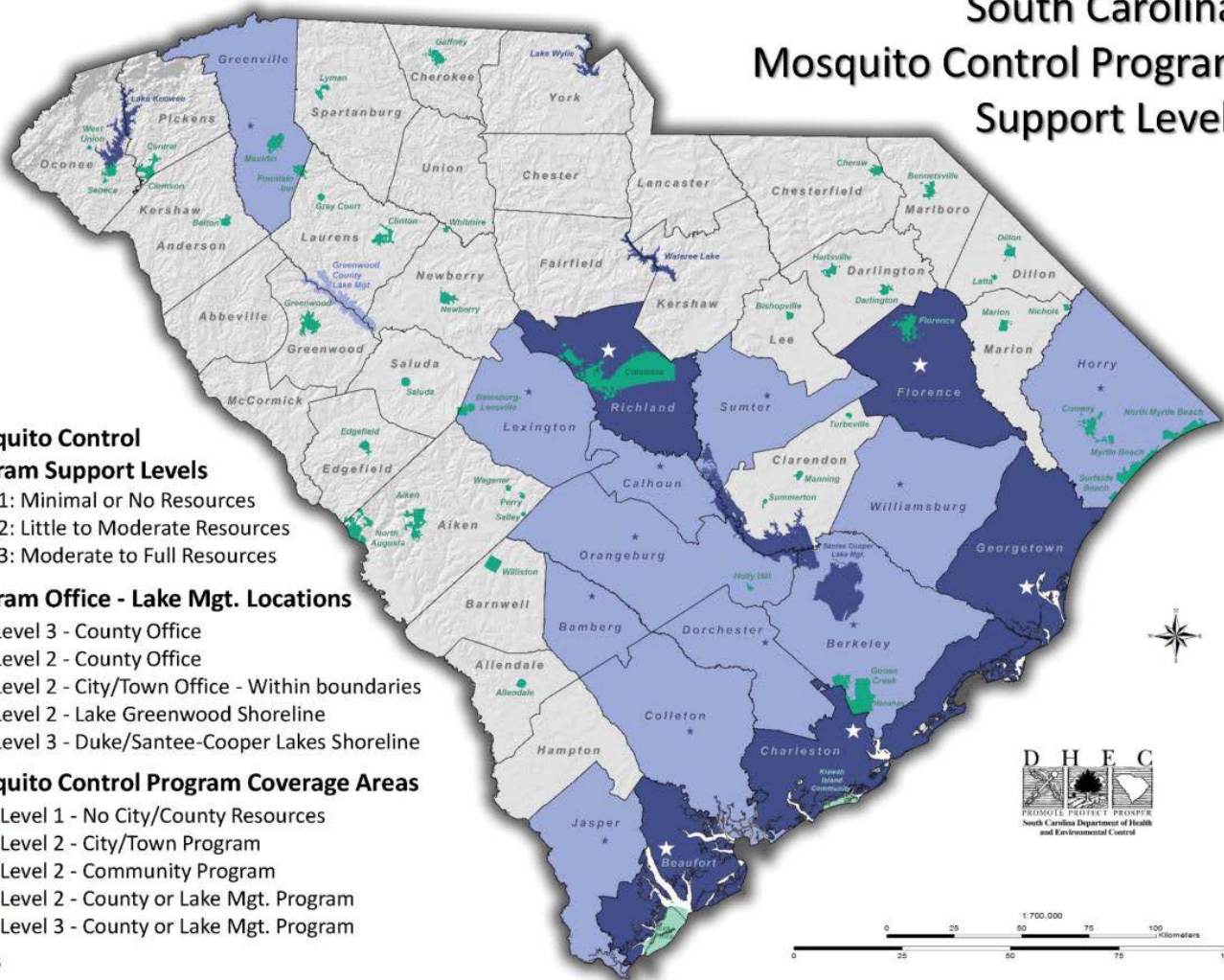
South Carolina Department of Health and Environmental Control

Coordinating a Centralized Arbovirus Surveillance Program

Robert Cartner – Medical Entomology Lab

Why a centralized, statewide
arbovirus surveillance program?

South Carolina Mosquito Control Program Support Levels



Mosquito Control Program Support Levels

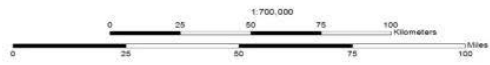
- Level 1: Minimal or No Resources
- Level 2: Little to Moderate Resources
- Level 3: Moderate to Full Resources

Program Office - Lake Mgt. Locations

- ☆ Level 3 - County Office
- ★ Level 2 - County Office
- ★ Level 2 - City/Town Office - Within boundaries
- ★ Level 2 - Lake Greenwood Shoreline
- ★ Level 3 - Duke/Santee-Cooper Lakes Shoreline

Mosquito Control Program Coverage Areas

- Level 1 - No City/County Resources
- Level 2 - City/Town Program
- Level 2 - Community Program
- Level 2 - County or Lake Mgt. Program
- Level 3 - County or Lake Mgt. Program



SC DHEC Arbovirus Surveillance History

- 1996 – SC DHEC Arbovirus beginning
- 2001- ELC Grant funding and arrival of WNV in South Carolina
- 2013 – DHEC “shake-up”

The Dillon Herald Thursday, September 9, 2004

City And DHEC Step Up Mosquito Efforts After Local Man Found To Have Probable Case Of West Nile Fever

A Dillon County man has been found to have a probable case of West Nile fever, making it the first human illness associated with West Nile virus in South Carolina this year, the state Department of Health and Environmental Control reported Friday.

The middle-aged patient died last month of other causes. Tests conducted by DHEC's Bureau of Laboratories determined that the patient probably had West Nile fever which did not cause the death.

With a probable human case of West Nile fever and a dead blue jay that tested positive for West Nile virus, public health officials are working to address community concerns in Dillon County.

"Dillon County environmental health officials have coordinated a plan with Dillon city government leaders," said Richard Turner, vector specialist for DHEC's Pee Dee Public Health District. A city-wide survey was conducted on September 8 (Wednesday).

Officials went door-to-door, handing out flyers and offering to do backyard inspections for mosquitoes. The purpose was to educate the public on how to protect themselves and to point out breeding areas. Turner said this really helps reduce the number of mosquitoes.



RICHARD TURNER of DHEC discusses the mosquito dipper with city employees before they went on a city-wide survey on Wednesday morning. (Photo by Betsy Finkler/The Dillon Herald)

Turner said this was the first time in the state that there was a joint city and DHEC response to West Nile.

Turner also said local environmental health workers have been trapping mosquitoes and sending them to DHEC's

Bureau of Laboratories in Columbia for testing. None of the mosquitoes have tested positive this year.

"DHEC's has collected these mosquitoes as the City of Dillon has conducted its mosquito spraying program."

(See DHEC, page 10A.)

Thursday, September 9, 2004

DHEC . . .

(Continued From Page 1A)

Following the report of a possible human case of West Nile fever in Dillon County, DHEC set 20 mosquito traps in the Dillon area. Results on those mosquitoes are due later this month.

Burt Rogers, head of the City of Dillon Street Department, said the city was already spraying for mosquitoes four days a week and this past week, increased spraying to five days a week.

"All of these efforts are a great example of how DHEC and the City of Dillon are working together to protect the public against the risk of mosquito borne disease," Turner said.

Turner urged Dillon County residents to protect themselves by getting rid of standing water on their property and by wearing long sleeves and long pants when outdoors and using a repellent containing DEET.

"I urge South Carolinians to be aware of West Nile virus and to take some simple steps to protect themselves against mosquito bites," said DHEC Commissioner C. Earl Hunter. "West Nile virus can result in flu-like symptoms such as a headache, swollen glands, muscle aches and a rash. Only about one in 150 people bitten by an infected mosquito, less than one percent, will become severely ill. In most cases, the virus results in a very mild disease and many people who may be exposed never become sick."

Hunter said mosquito bites transmit the virus to humans.

"This happens when a mosquito bites an infected bird and then bites a person," he said. "Birds cannot transmit West Nile virus to humans nor can the virus be spread from person to person."

Hunter also urged South Carolinians to protect themselves.

"Be sure to look around your home and property and empty any standing water from containers such as flower pots, tires and bird-baths," Hunter said. "When participating in outdoor activities at night when mosquitoes are most active, be sure to wear protective clothing and use repellents. Screens on porches and windows should be used to keep mosquitoes from getting into your home. Change the water in bird baths and pet bowls at least twice a week and keep your gutters clean and in good working order."

South Carolina has now had eight cases of human illness associated with West Nile Virus since first found here in 2002. Since the virus has become commonplace in the state, no additional new releases about human cases will be issued. Information on the confirmation of positive birds or other human cases may be found in regular updates on the DHEC web site at www.scdhec.gov.

Hunter said surveillance efforts by DHEC staff continue throughout the state. Residents who find dead crows and blue jays are encouraged to contact the Environmental Health office in DHEC's 46 county health departments. General information about West Nile virus is available at any of DHEC's county health departments or DHEC's Web Site at www.scdhec.gov.





Today:

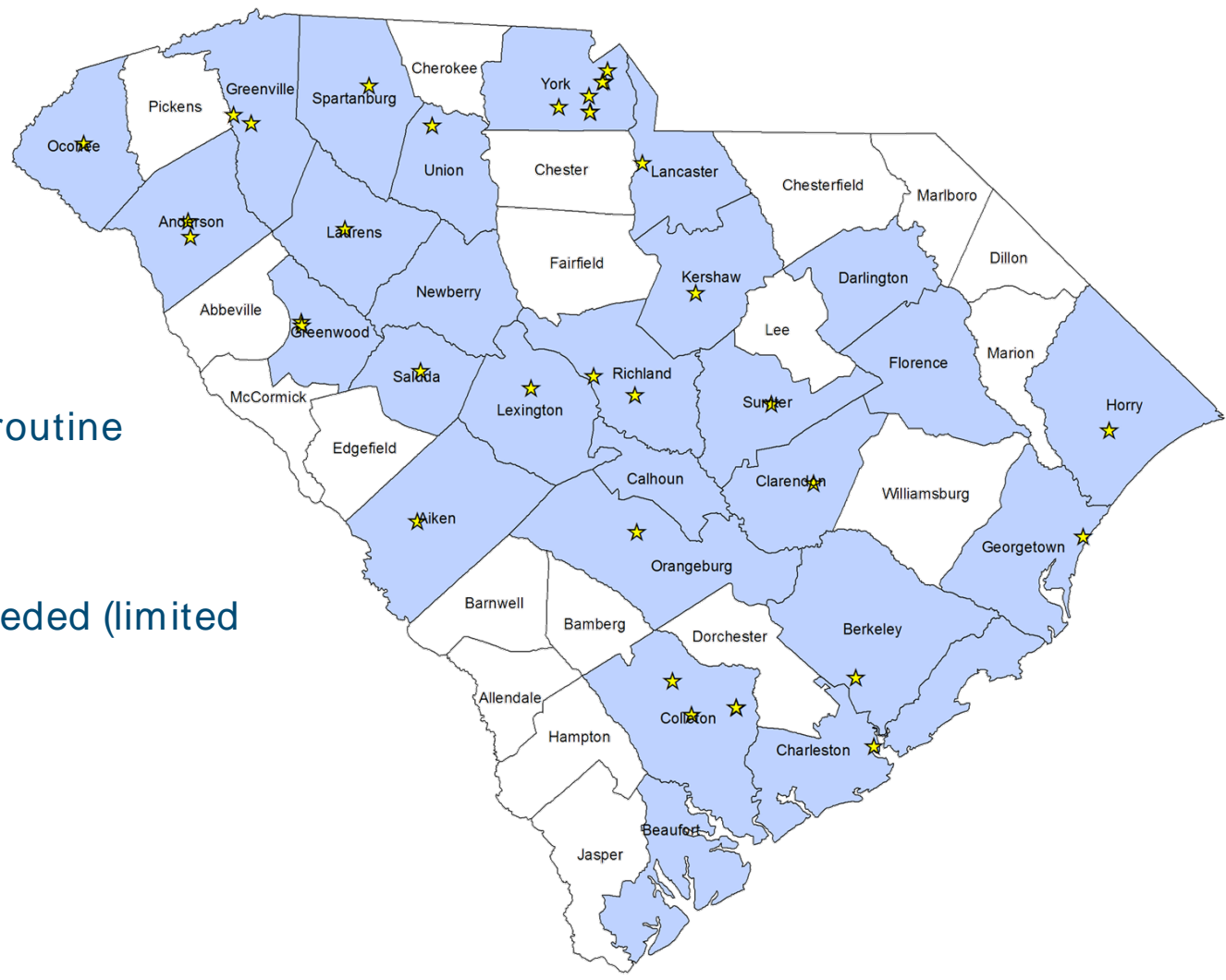
Arbovirus Surveillance Program Staff

- Dr. Chris Evans
 - State Public Health Entomologist
- Robert Cartner

- Travis Shealy (“Adjunct” Vector Specialist Coordinator)

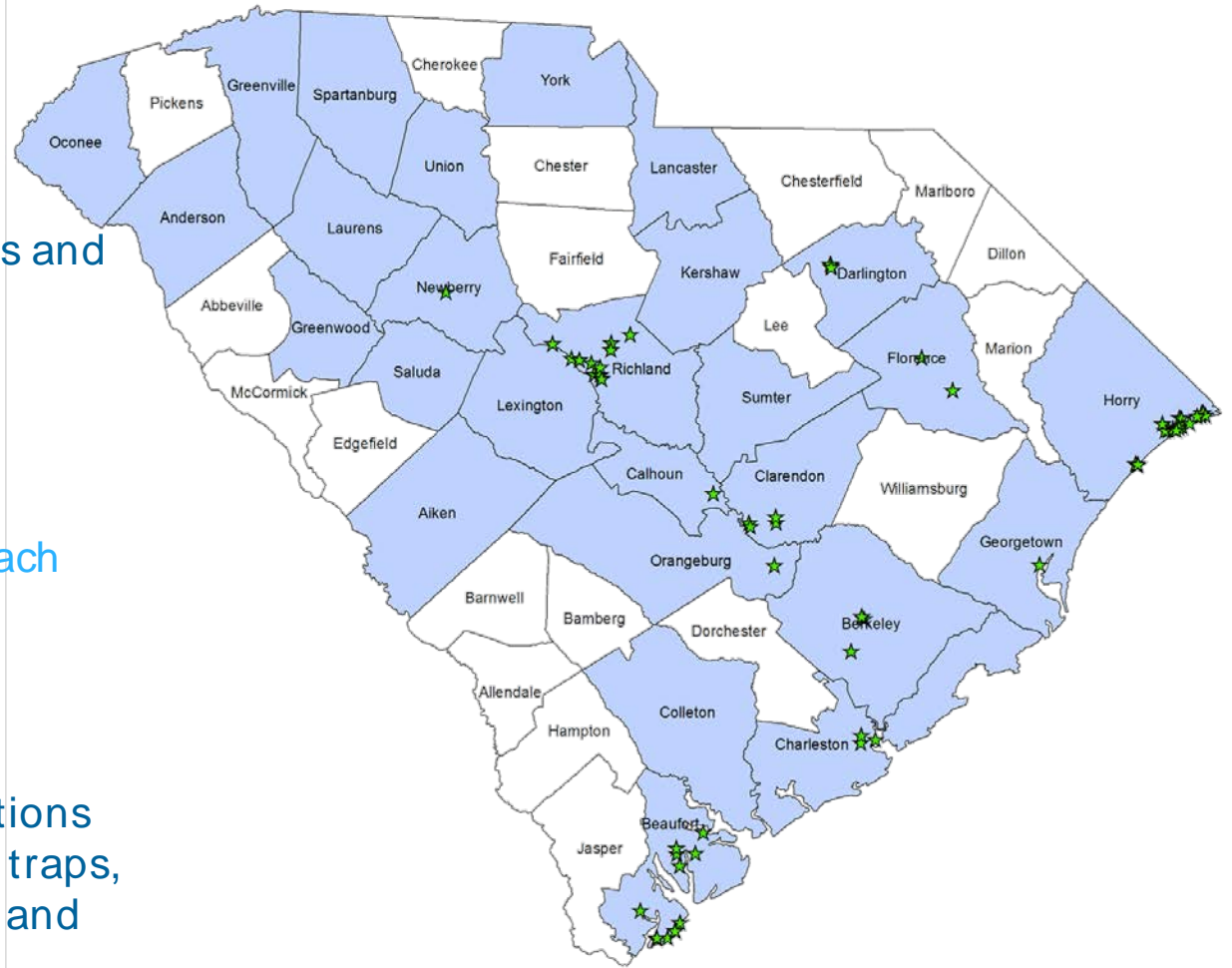
DHEC Vector Specialists

- 22 Vector Specialists
- Covering 19 counties (routine surveillance)
- Can be deployed as needed (limited to work area though)



Non-DHEC Arbovirus Surveillance Partners

- 8 mosquito control programs and 1 Lake Impoundment
 - Beaufort County
 - Charleston County
 - City of Hartsville
 - City of Newberry
 - City of North Myrtle Beach
 - Florence County
 - Georgetown County
 - Richland County
 - Santee Cooper
- More diverse collection locations using gravid traps, CDC light traps, BG Sentinel traps, aspirator, and EVS traps



Training Vector Specialists

- Who is using the traps?
- What is a mosquito trap?
- When do you set and collect a mosquito trap?
- Where do you set a mosquito trap?
- Why do we trap and why does a trap work?
- How does a trap work?

Outfitting a Surveillance Program : Equipment



Outfitting a Surveillance Program : Consumables

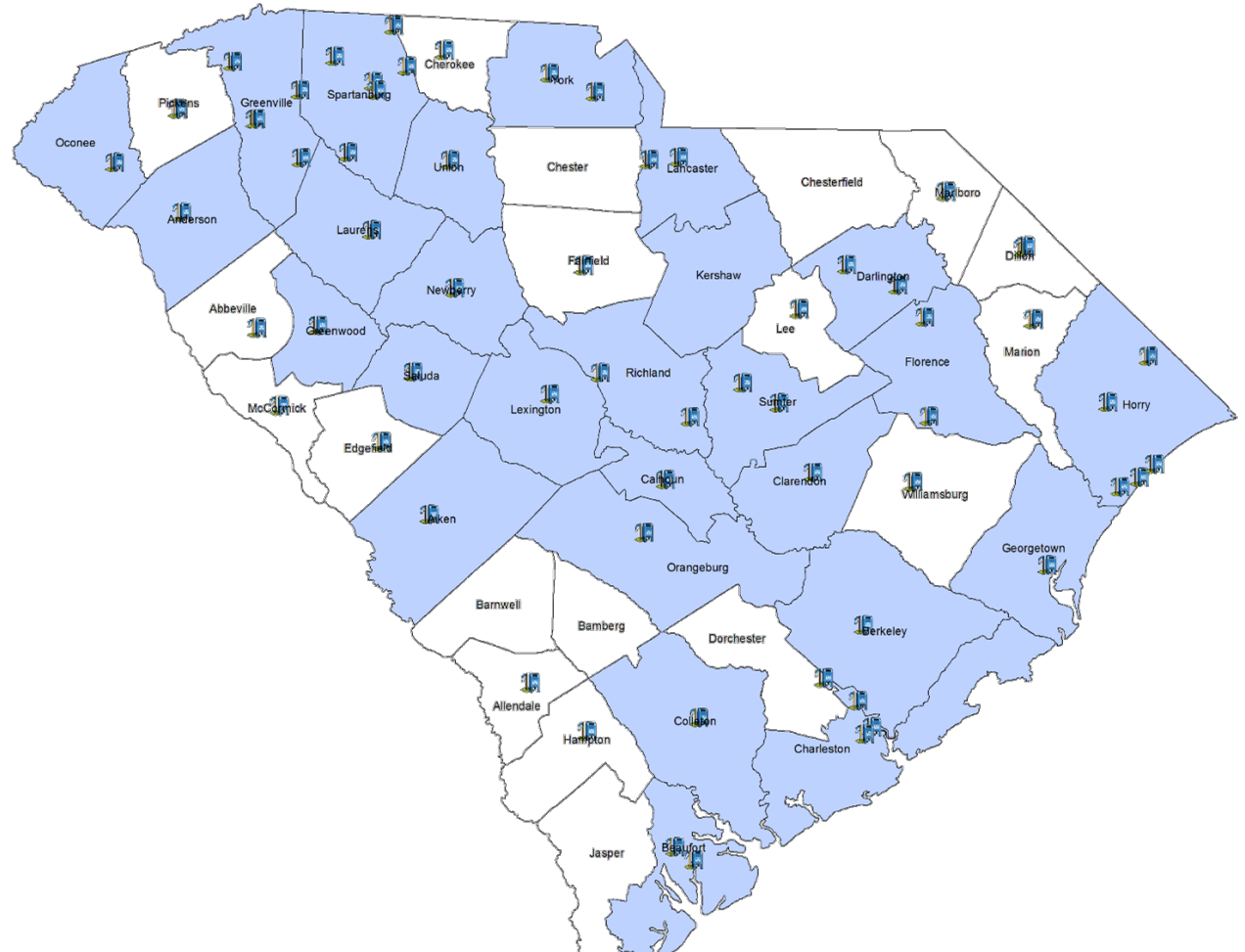


Equipment Repair

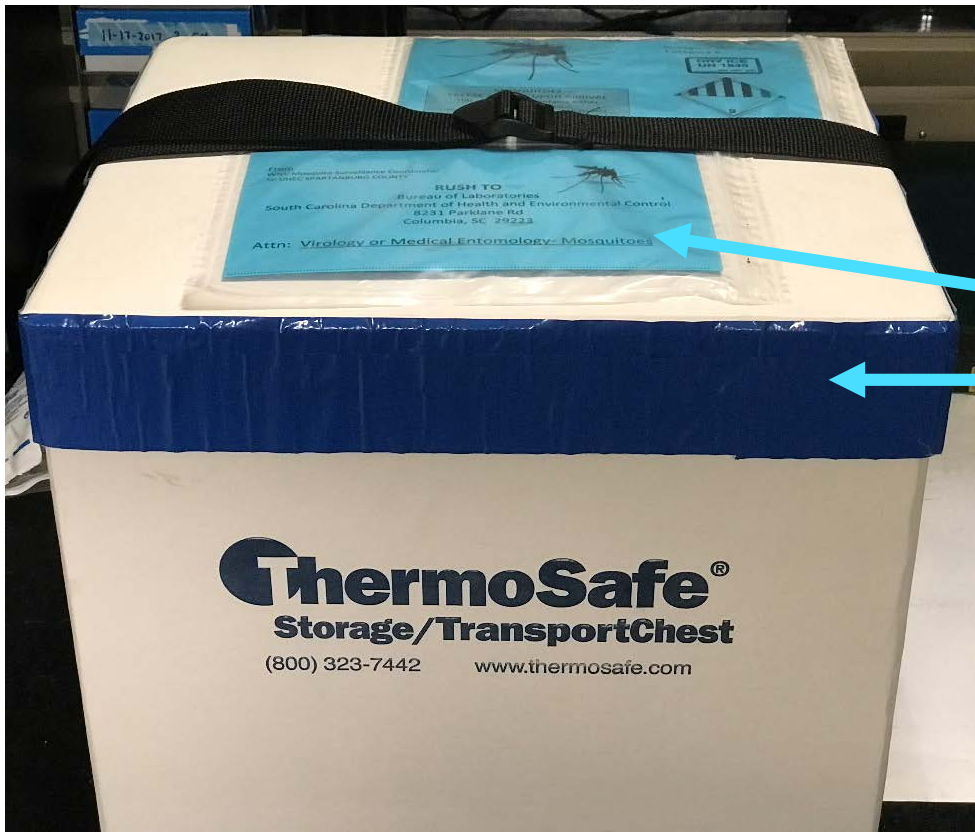


Interagency Mail Service (IMS)

- Overnight shipping
- Access to majority of agency offices




Mosquito Shipping Box



Blue labels and border
to distinguish from
boxes carrying animal
heads


ThermoSafe[®]
Storage/TransportChest
(800) 323-7442 www.thermosafe.com

Shipping Labels




Biological substance,
Category B

DRY ICE
UN 1845
KG NET WT.



MOSQUITOES
FREEZE AT -70°C UPON ARRIVAL
This shipper also contains either
cold packs or dry ice.
Emergency Contact - Dr. Chris Evans (803) 896-3802


From
WNV Mosquito Surveillance Coordinator
SC DHEC RICHLAND COUNTY



RUSH TO
Bureau of Laboratories
South Carolina Department of Health and Environmental Control
8231 Parklane Rd
Columbia, SC 29223

Attn: Virology or Medical Entomology- Mosquitoes

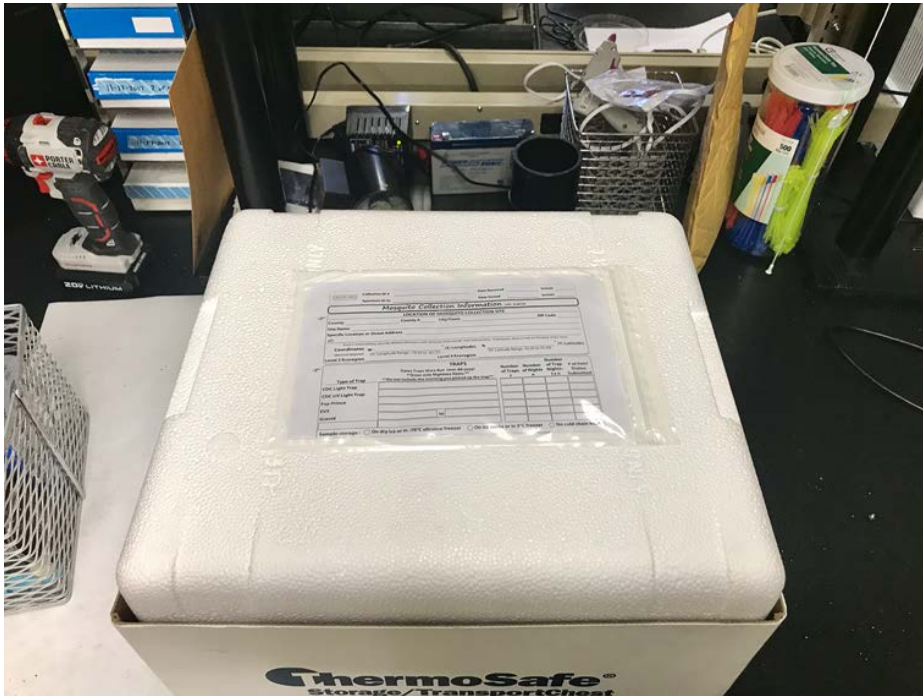
FROM:
Bureau of Laboratories
SC DHEC
8231 Parklane Rd
Columbia, SC 29223



RETURN TO:
ROBERT CARTNER
SC DHEC RICHLAND COUNTY
C/O SC DHEC BUREAU OF LABORATORIES
8231 PARKLANE RD.
COLUMBIA SC 29223

Notify to pick up this package. Do not unpack ice packs.
(803) 896-0940; cartner1@dhec.sc.gov

Mosquito Shipping Box



Mosquito Collection Information Form

LAB USE ONLY	Collection ID # _____	Date Received _____	Initials _____
	Specimen ID #s _____	Date Sorted _____	Initials _____

Mosquito Collection Information (rev. 3/2015)

LOCATION OF MOSQUITO COLLECTION SITE

County County # City/Town ZIP Code

Site Name _____

Specific Location or Street Address _____

afs _____

If not a street address, provide detailed directions with distances from nearby road intersections. If necessary, draw a map on the back of this form.

Coordinates W (decimal degrees) (SC Longitude Range: -78.50 to -83.37) $^{\circ}$ (X; Longitude), N $^{\circ}$ (Y; Latitude) (SC Latitude Range: 32.00 to 35.30)

Level 3 Ecoregion Level 4 Ecoregion

TRAPS

Clear Trap Info Dates Traps Were Run (mm-dd-yyyy) Number of Traps Number of Trap Nights Number of Petri Dishes Submitted

Enter only Nighttime Dates.

Type of Trap	t	n	t x n	Submitted
CDC Light Trap				
CDC UV Light Trap				
Fay-Prince				
EVS				
Gravid				

Sample storage: On dry ice or in -70°C ultralow freezer On ice packs or in 0°C freezer No cold chain kept

. Number of trap nights = number of traps you set multiplied by the number of nights you trapped.

LAND OWNER (Contact Person for Site Location)

Name _____

Street Address _____

City State ZIP Code

E-Mail _____ Phone _____ FAX _____

COLLECTOR (Name of the person who performed the collection)

Name _____

Street Address _____

City State ZIP Code

E-Mail _____ Phone _____ FAX _____

HABITAT (Check all that apply)

Urban Rural Forest Edge of Forest Open Area Pond/Lake
 River/Stream Ground Pools Ditches Freshwater swamp/marsh/bog Salt Marsh
 Containers Nearby Other Habitat Type(s) _____

Temperature: High (°F) _____ Low (°F) _____ Relative Humidity (%) _____

COMMENTS

Run gravid traps for a minimum of 4 consecutive nights and a maximum of 5 consecutive nights. Run light traps for 1 night.
 Turn in your collection immediately after your trapping cycle

Mosquito Shipping Box



Mosquito Samples

Richland Co. (40)
Columbia
8231 Parklane Rd

Gravid Trap X 4
1 May – 4 May 2017
R. Cartner



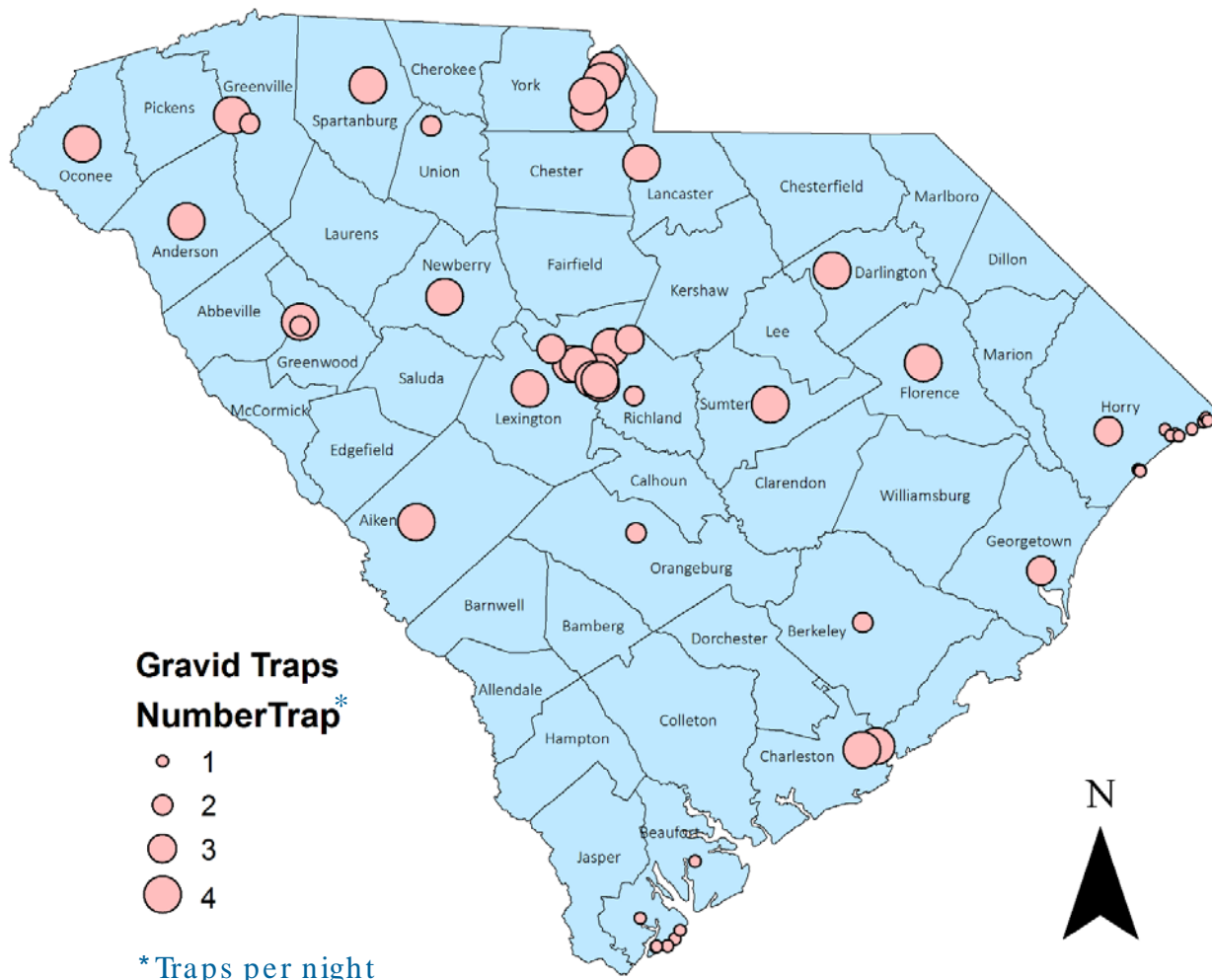
Trapping Frequency

- Traps set March – November
 - Start and end date depend on weather and temperature
- VecSpecs are asked to trap at least one week a month, and two weeks during July, August, and September (peak WNV season)
- Schedule is created to keep too many samples from coming in at one time

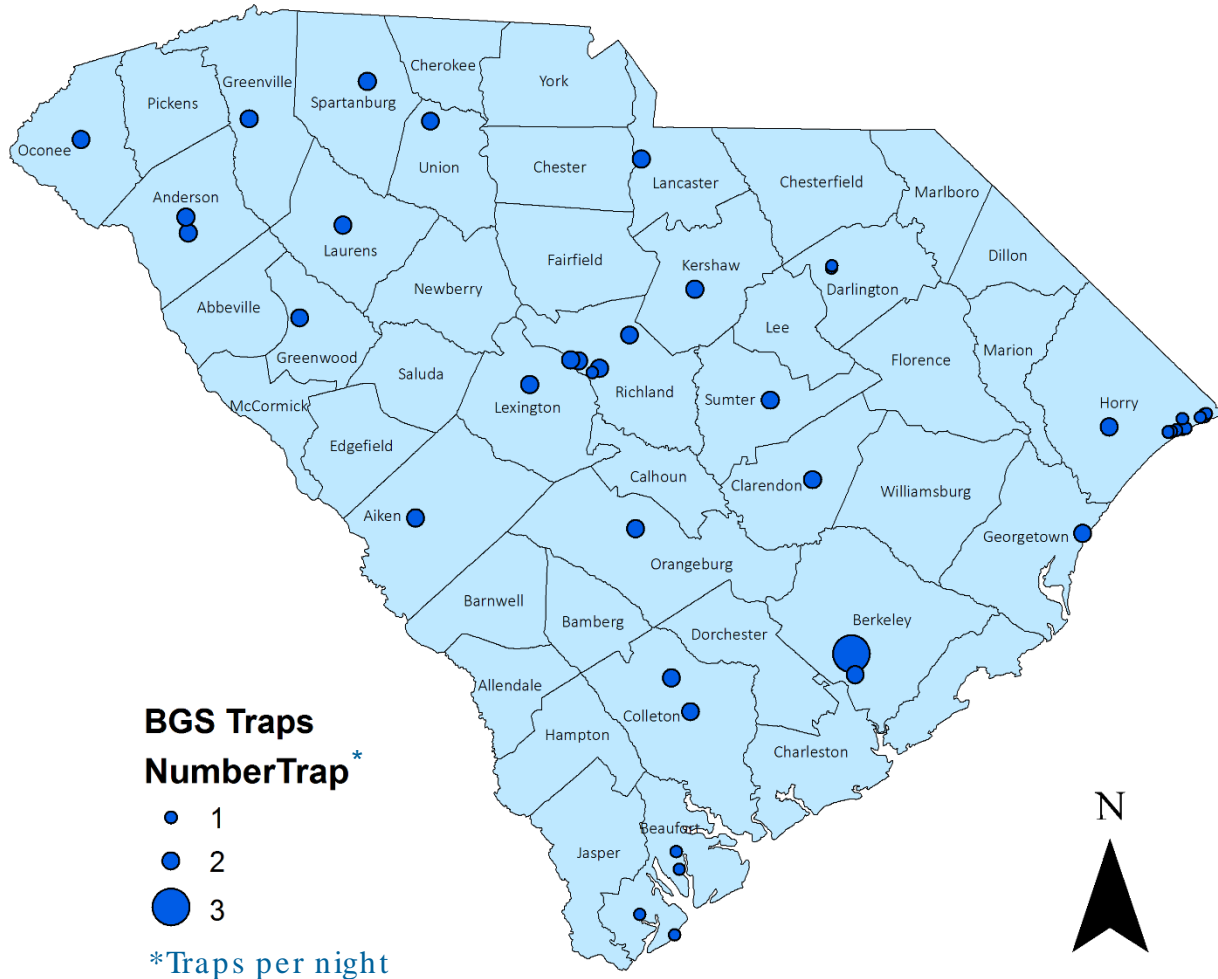


2017 Trapping Location Summary

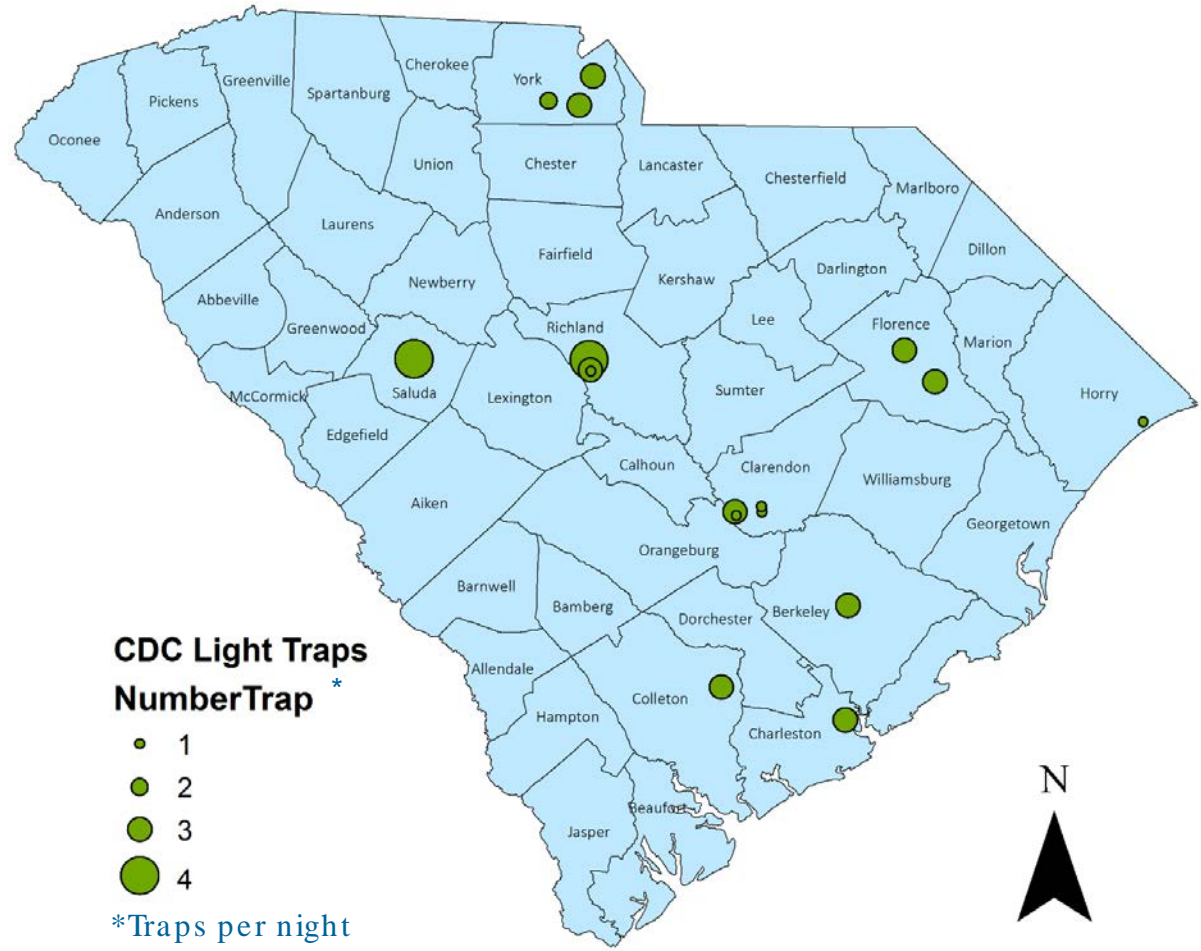
Gravid Traps (2017)



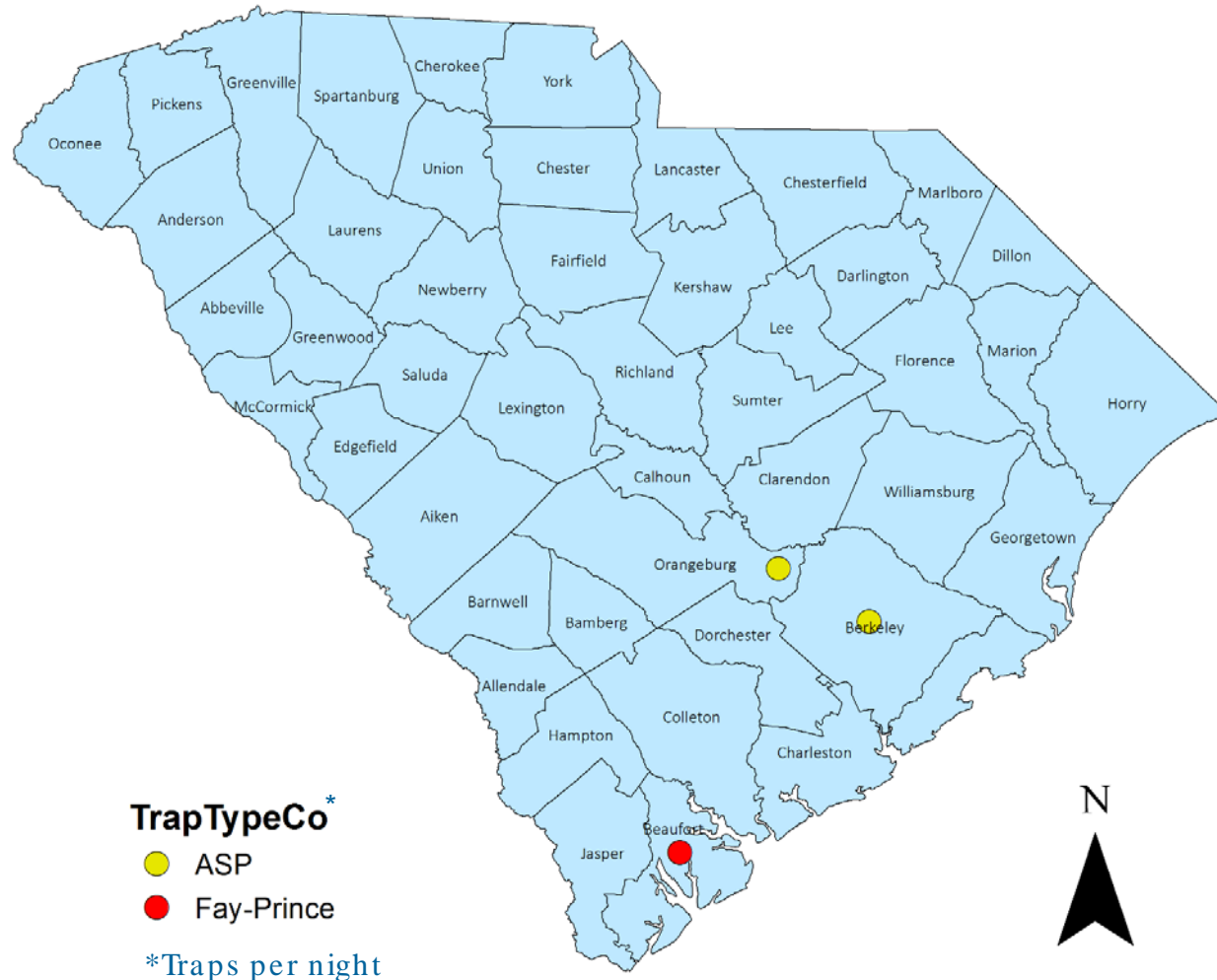
BG Sentinel 2.0 Traps (2017)



CDC Light Traps (2017)



Aspirator and Fay-Prince Traps (2017)



Arbovirus Testing Process

- Mosquitos identified to species and pooled
- Sent to Virology laboratory for testing
- Mosquito pools screened by cell culture and/or RT-PCR
 - Process is being refined for 2018
- Testing needs to be efficient, but also thorough

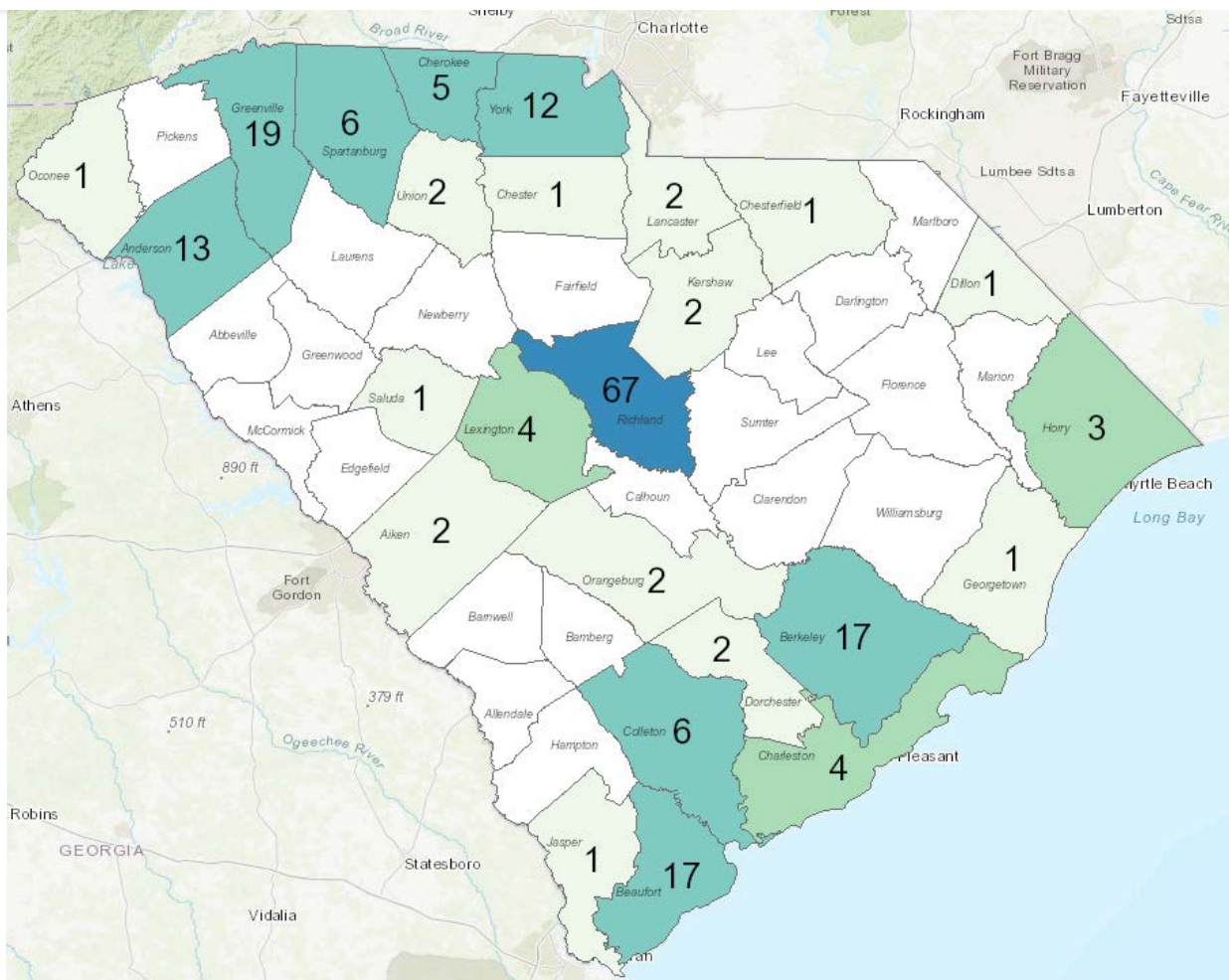
Notification of Positive Test Results

- Process more complicated after arrival of Zika
- Notification is sent to DHEC Health Director (HD) in affected region
 - Disseminated downward through DHEC region
- HD notifies county and/or city
- Medical Entomology provides suggestions for control zones

Interactive Case Map

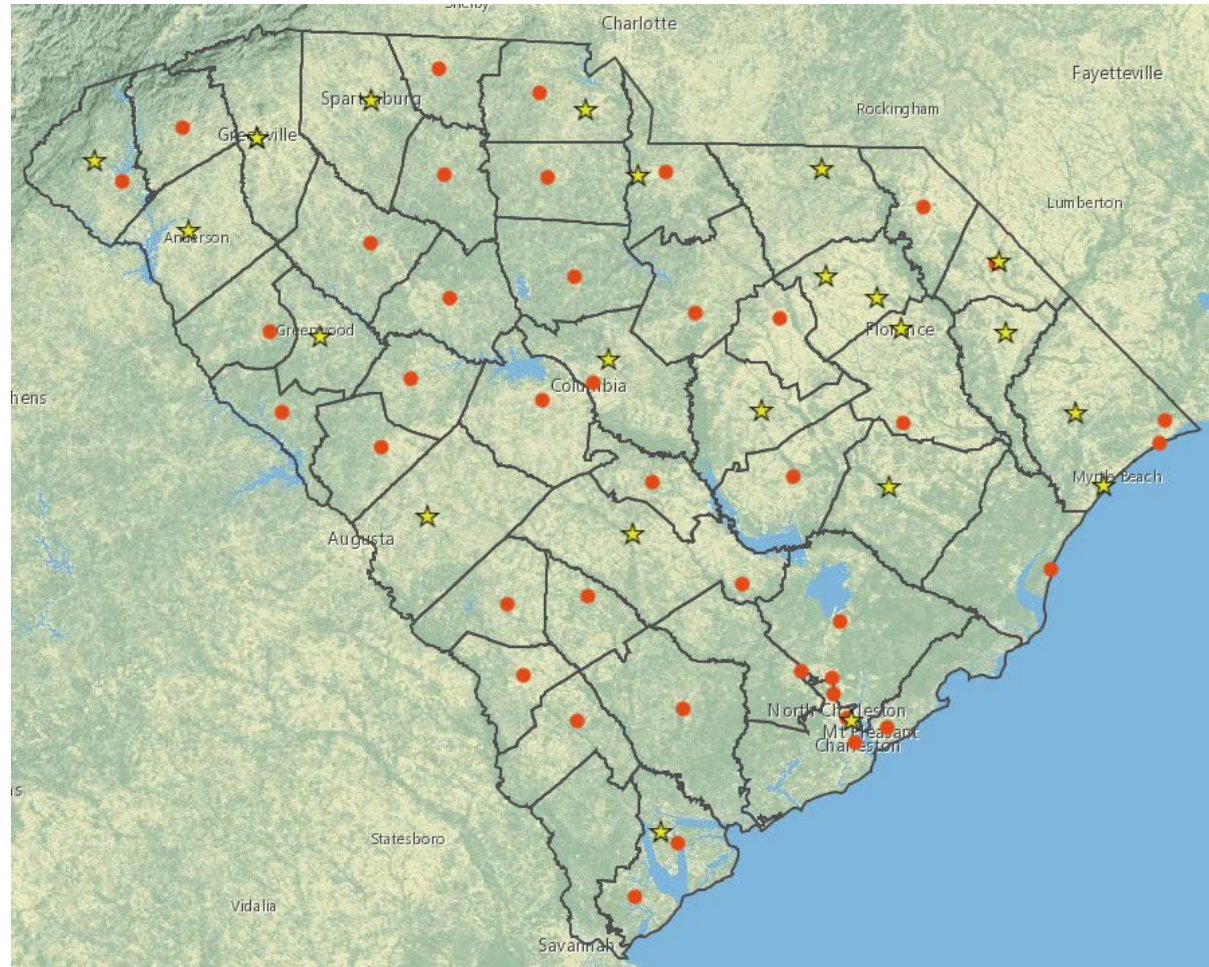
Operational layers

- SCDHEC Mosquito-Borne Disease Cases and Number of Animals Tested
- Confirmed Cases for 2017 - View one map at a time.
- All Cases by County
- Birds - West Nile Cases
- Mosquitoes - Flanders Cases
- Mosquitoes - West Nile Cases
- Veterinary Animals - Eastern Equine Encephalitis Cases
- Veterinary Animals - West Nile Cases
- Birds Tested for Mosquito-Borne Disease
- Mosquitoes Tested for Mosquito-Borne Disease
- Veterinary Animals Tested for Mosquito-Borne Disease
- County



Dead Bird Drop Off

- Interactive map for finding drop-off locations
 - <https://gis.dhec.sc.gov/WestNile/>
- Staff can pick up birds if drop-off isn't possible
- Birds are tested in-house



Veterinary Animal Testing

- Contract with Clemson Veterinary Diagnostic Center (CVDC) for WNV and EEE testing of veterinary animals

Program Goals

- Initiate mosquito rearing program
- Initiate pesticide resistance testing program
- Initiate *Ae. aegypti* and *Ae. albopictus* egg surveillance program
- Increase statewide surveillance program

Program Benefits

- Building relationships with local mosquito control programs
- Building relationships with county and city governments
- Monitoring species habitats and ranges
- Recognizing species range increases
 - *Ae. j. japonicus*
 - *Cx. coronator*
 - *Ma. titillans*



Thank You!

Contact Info

CARTNERL@dhec.sc.gov

Phone: (803) 896-0940

Cell: (803) 609-6814