GEORGIA DEPARTMENT OF PUBLIC HEALTH, ENVIRONMENTAL HEALTH

MOSQUITO SURVEILLANCE, 2017

Limited mosquito surveillance programs are operated in only a few Georgia counties. Some counties conduct mosquito control activities without appropriate mosquito surveillance. Data obtained from mosquito surveillance activities are important to guide vector control operations by identifying vector species, providing an estimate of vector species abundance, and by indicating geographic areas where humans and animals are at greatest risk of exposure to WNV or other arboviruses.

Our goals for the 2017 mosquito surveillance season included doing some level of mosquito surveillance in every county in Georgia, providing equipment and training to Environmental Health Specialists in all 18 Public Health Districts, and having the ability to support local outreach for mosquito complaints. The accomplishment of these goals will allow the Georgia Department of Public Health to be better prepared for the next mosquito-borne disease to emerge.

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Overview

A scientifically driven surveillance program is the backbone of every mosquito control operation. Surveillance for native and exotic species should be part of mosquito control, regardless of the immediate threat of disease outbreaks. Surveillance should be developed proactively to justify mosquito control funding requirements and risk for arboviral disease transmission.

The primary purpose of mosquito surveillance is to determine the species composition, abundance, and spatial distribution within the geographic area of interest through collection of eggs, larvae, and adult mosquitoes. Surveillance is valuable for determining changes in the geographic distribution and abundance of mosquito species, evaluating control efforts by comparing pre-surveillance and post-surveillance data, obtaining relative measurements of the vector populations over time, accumulating a historical database, and facilitating appropriate and timely decisions regarding interventions.

VECTOR SURVEILLANCE COORDINATOR DISTRICTS (VSC)

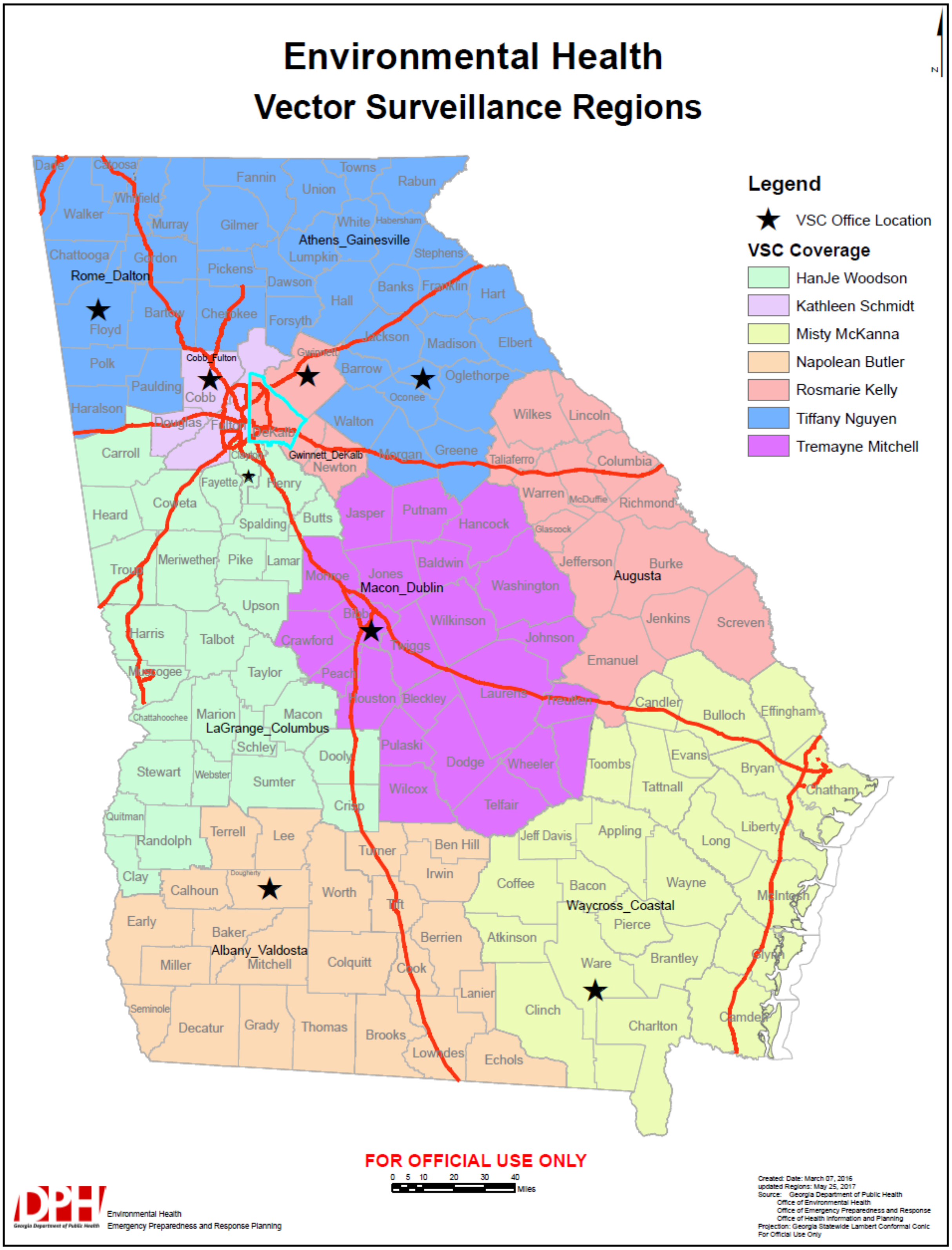
Prior to the 1960s and 70s, adequate infrastructure, funding, and public support existed to fight mosquitoborne diseases such as Yellow Fever, Dengue and Malaria. However, once these diseases were eradicated in the US, public health policy decisions greatly decreased the resources for surveillance, prevention, and control of vector-borne diseases in the 1960s and 1970s. This was primarily because control programs had reduced the public health threat from these diseases. Those decisions, notwithstanding the technical problems of insecticide and drug resistance, as well as too much emphasis on insecticide sprays to kill adult mosquitoes, contributed greatly to the resurgence of diseases such as malaria and dengue, and the introduction and rapid spread of diseases such as WNV. Decreased resources for infectious diseases in general resulted in the discontinuation or merger of many programs and ultimately to the deterioration of the public health infrastructure required to deal with these diseases. Moreover, good training programs in vector-borne diseases decreased dramatically after 1970. Thus, we were faced with a critical shortage of specialists trained to respond effectively to the resurgence of vector-borne diseases.

The likely consequence to Georgia of a continued lack of good vector surveillance and control programs is that we would not know which mosquitoes (thus which diseases) were present in specific areas of the state. We would be unable to provide accurate information regarding risk of disease; we would not know which new arboviruses were being introduced to Georgia and which were being competently vectored. We would be unable to detect arboviral pathogens early, before they infect humans. Georgia would experience cases of arboviral disease that could have been prevented, and, because some of these pathogens are singularly lethal, Georgia would experience unnecessary morbidity and mortality.

The establishment of 5 Regional Vector Surveillance Coordinators (VSC) has begun to rebuild Georgia's capacity to detect and respond to existing and newly introduced vector-borne diseases. Eleven of 18 Health Districts have been assigned a VSC, whose responsibility is to conduct and improve mosquito surveillance for arborviral diseases such as West Nile Virus, Eastern Equine Encephalitis, Lacrosse Encephalitis, Zika and other mosquito-borne diseases. Duties include establishing surveillance locations throughout the PH Districts, setting up traps and collecting mosquitos, mosquito identification, complaint response, community assessments, and community education programs. When necessary, the VSC will coordinate mosquito control activities with existing city/county/contracted mosquito control agencies and assist with localized control efforts. In addition, the VSC supports the Environmental Health Team by assisting with surveillance for other public health pests of concern, including tick-borne diseases, rabies, and bedbugs. They also may participate in outbreak detection and response activities for emergency preparedness.

The following map displays the Vector Surveillance regions in Georgia.

OVERVIEW



Environmental Health
Vector Surveillance Regions
Legend
VSC Office Location
VSC Coverage
HanJe Woodson
Kathleen Schmidt
Misty McKanna
Napolean Butler
Rosmarie Kelly
Tiffany Nguyen
Tremayne Mitchell
Rome_Dalton
Athens_Gainesville
Gwinnett_DeKalb
Macon_Dublin
Augusta
LaGrange_Columbus
Albany_Valdosta
Waycross_Coastal
FOR OFFICIAL USE ONLY
0 5 10 20 30 40
Miles
Environmental Health
Emergency Preparedness and Response Planning
Created: Date: March 07, 2016
updated Regions: May 25, 2017
Source: Georgia Department of Public Health
Office of Environmental Health
Office of Emergency Preparedness and Response
Office of Health Information and Planning
Projection: Georgia Statewide Lambert Conformal Conic
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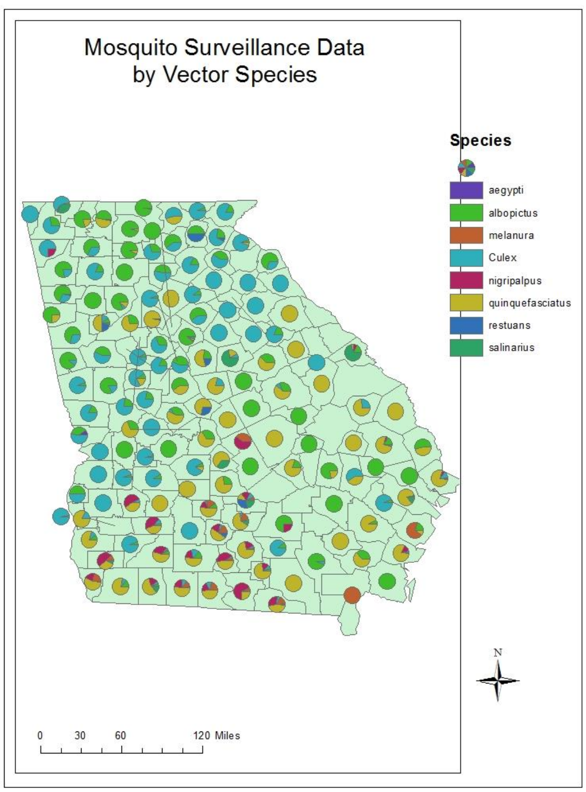
OVERVIEW

NON-VSC DISTRICTS

Due to limited funding, not all Health Districts were assigned a VSC to assist with mosquito surveillance. These Districts (1-1, 1-2, 2-0, 3-4, 3-5, 6-0, and 10-0) were assigned to the State Entomologists, Dr. Thuy-vi Thi Nguyen and Dr. Rosmarie Kelly. However, some of these Districts already had mosquito surveillance programs, and some of them had an Environmental Health Director or Environmental Health Specialists (EHS) who had an interest in doing mosquito surveillance within their District or county.

The maps (FIG 1) used in this document were all created in December 2017. They depict the month(s) in which surveillance was done in each county and the presence or absence of the important vector species *Aedes aegypti*, *Ae albopictus*, *Culiseta melanura*, *Culex* spp, *Cx nigripalpus*, *Cx quinquefasciatus*, *Cx restuans*, and *Cx salinarius*. All species trapped are listed in a table for each District by county



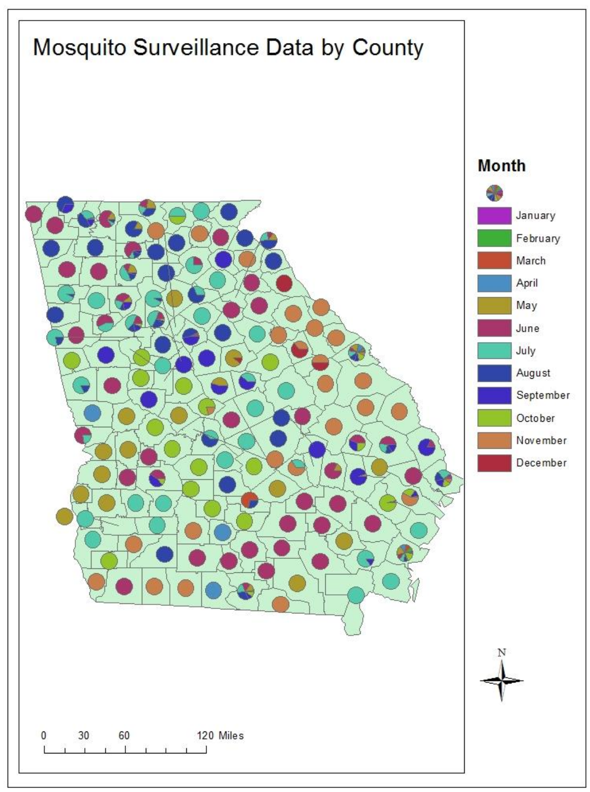


Figure 1: Mosquito Surveillance, Georgia 2017

OVERVIEW

Surveillance

Adult mosquito monitoring is a necessary component of surveillance activities and is directed toward identifying where adults are most numerous. This information drives response to service requests and helps determine whether interventions (source reduction, larviciding, and/or adulticiding) are effective.

There are a variety of different mosquito traps, but generally two different types of traps are used. One type, a gravid trap, selectively attracts container- breeding mosquitoes that have had a blood meal and are looking for a place to lay eggs. The other type, a light trap, attracts mosquitoes looking for a blood meal. Recently, a third type of trap, the BG-Sentinel trap has been used in areas where exotic arbovirus cases have been detected. This trap is very specific for the ZIKV, CHIK, and DEN vectors, *Ae aegypti* and *Ae albopictus*. With all three traps, as the mosquito gets close, it gets suctioned into the trap by a small fan. Mosquitoes caught in these traps are counted and identified, then pooled according to date, species, and location and (possibly) sent to a lab for testing.

Most of the surveillance and mosquito identification was done by the Vector Surveillance Coordinator (VSC) and the two GDPH entomologists, as well as by Environmental Health Specialists (EHS) in the non-VSC Districts.

GRAVID TRAP

This trap selectively attracts container-breeding mosquitoes that lay eggs in stagnant organically rich water. These mosquitoes will have had at least one blood meal, so may possibly have picked up an infected blood meal if there are WNV+ birds in the area.

LIGHT TRAP

Light traps attract mosquitoes looking for a blood meal. The attractants used are light and CO_2, in the form of dry ice or as compressed gas in canisters. These traps are useful for providing information about the mosquito species found in the area under surveillance. Because they attract mosquitoes looking for a blood meal that may have just emerged and never had a blood meal previously, the likelihood of finding virus in these mosquitoes is much reduced.

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BG SENTINEL TRAP

What makes the BG-S trap different? It:

- Mimics convection currents created by a human body
- Employs attractive visual cues
- Releases artificial skin emanations through a large surface area
- Can be used without CO2 to specifically capture selected mosquito species

Used in combination with the BG-Lure, a dispenser which releases a combination of non-toxic substances that are also found on human skin (ammonia, lactic acid, and caproic acid), the BG-Sentinel trap is especially attractive for the yellow fever (or ZIKV) mosquito, *Aedes aegypti*, the Asian tiger mosquito, *Aedes albopictus*, the southern house mosquito, *Culex quinquefasciatus*, and selected other species.

With the addition of carbon dioxide, the BG-Sentinel trap is an excellent surveillance tool for mosquitoes in general.

MOSQUITO BREEDING HABITAT TYPES

There are two general categories within which mosquito breeding habitats exist: natural mosquito breeding habitats and man-made mosquito breeding habitats. Female mosquitoes lay their eggs either on water or on soils that are periodically flooded. These breeding areas can be found in habitats that exist naturally, such as within a pond or flood plain, or in habitats that have been created by humans, such as bird baths, water-filled tires, or catch basins. Mosquitoes can breed in a wide variety of locations, and the discussion below provides a description of the general types of habitats where mosquitoes are known to breed.

NATURAL MOSQUITO BREEDING HABITATS

Temporary Woodland Pools:

Shallow, temporary pools are common in woodland areas during the spring and wet summers in low lying areas or in small depressions where a variety of mosquito species will breed, most commonly *Ochlerotatus canadensis* and *Aedes vexans*. These mosquitoes lay their eggs along the edges of the pool and when rainwater or melting snow fills these pools the larvae hatch.

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Freshwater Ponds:

The larvae of Anopheles are found primarily in small ponds among the emergent vegetation. Ponds clogged with vegetation can breed large numbers of mosquitoes because of the vast amounts of organic matter available to mosquito larvae for feeding and because fish and other aquatic predators cannot readily feed on the larval mosquitoes.

Streams and Floodplains:

Streams with running water rarely produce mosquitoes. However, mosquitoes need to be near water in order to lay their eggs. Anopheles and Culex mosquitoes are two types of species that can sometimes be found in isolated pockets adjacent streams or within floodplain areas that undergo only periodic flooding.

Tree Holes and Other Natural Containers:

Tree holes and other natural containers, such as pitcher plants or water trapped in or on plant leaves, can also serve as breeding habitats for mosquitoes, such as *Ochlerotatus triseriatus*. Frequent rainfalls maintain standing water within these types of microhabitats and can breed mosquitoes throughout the summer.

Freshwater Marshes and Swamps:

Mosquitoes, such as *Coquillettidia perturbans*, breed in freshwater marshes and swamps consisting of emergent vegetation. These types of habitats can occur in both woodland and open field habitats. Larvae attach themselves to the stems and roots of the vegetation to obtain oxygen, and do not need to swim up and down in the water column to feed and to breath. Due to this adaptation, these larvae can avoid exposure to predatory fish.

MAN-MADE MOSQUITO BREEDING HABITATS

Stormwater/Wastewater Detention:

A catch basin typically includes a curb inlet where storm water enters the basin to capture sediment, debris and associated pollutants. Similarly, detention/retention basins that perform similar functions for other types of wastewaters, such as waste treatment settlement ponds, provide a similar type of breeding habitat to that of the storm water catch basin. These detention basins provide breeding habitat for urban mosquito species, such as *Culex quinquefasciatus*. Moisture and organic debris captured within the detention basin can aid in development and provide nutrients for growing larvae.

Roadside Ditches:

Roadside ditches are the suitable habitat for many species of Culex mosquitoes. The larvae of *Culex quinquefasciatus* and *Culex restuans*, for example, can survive in waters with high organic content. Culex mosquitoes will lay their eggs directly on the water's surface; therefore, ditches that hold water for extended periods of time can breed large numbers of mosquitoes.

Artificial Containers:

Artificial containers left out to collect rainwater such as tires, bottles, buckets, and birdbaths can provide an excellent mosquito-breeding habitat free from any predators. Many tree-hole mosquitoes have learned to adapt to using these man made mosquito nurseries. *Aedes albopictus*, our most common pest species, also breeds readily in these artificial containers. The abundance of organic debris, which can also collect in these containers, allows for the proliferation of mosquito breeding during a season.

Control – A Message for the Public

The mosquitoes of most importance to public health in Georgia are *Culex quinquefasciatus*, the Southern house mosquito, and *Aedes albopictus*, the Asian tiger mosquito. Both these species lay eggs in such artificial containers as birdbaths, gutters, tires, flowerpots, and any other container that holds water for at least a week. The Southern house mosquito prefers organically polluted water for laying its eggs, and bites at dusk. It feeds primarily on birds, but will bite mammals, and is our primary vector for WNV. The Asian tiger mosquito prefers cleaner water for laying its eggs, and bites during the day. It feeds primarily on mammals. It has been found positive for WNV in Georgia and is a vector of ZIKV.

The best way to control these species is to dump out or treat standing water, treat catch basins with larvicide, and to cut back heavy vegetation where the mosquito will rest when not out biting. These mosquitoes will shelter in abandoned houses. Thermal fogging or barrier spray around these houses can help to reduce resting and overwintering mosquitoes. Two larvicides are available to the public for treating standing water, Mosquito Torpedoes (methoprene) and Mosquito Dunks (Bti). Both are available online, and from Home Goods or Hardware Stores, and occasionally from large chain Pet Stores. Hand-held foggers can also be used to reduce biting populations of mosquitoes, but this solution is temporary and needs to be followed up with good source reduction (removing breeding sites) and larviciding.

OVERVIEW

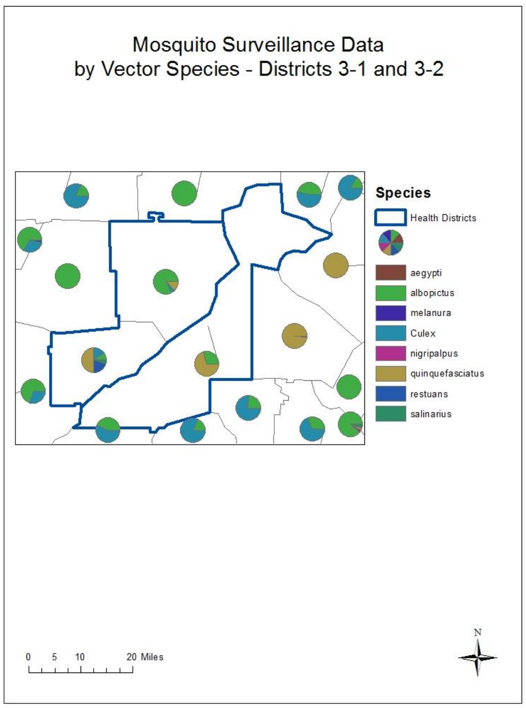
NOTE: Is it *Aedes*, or is it *Ochlerotatus*?

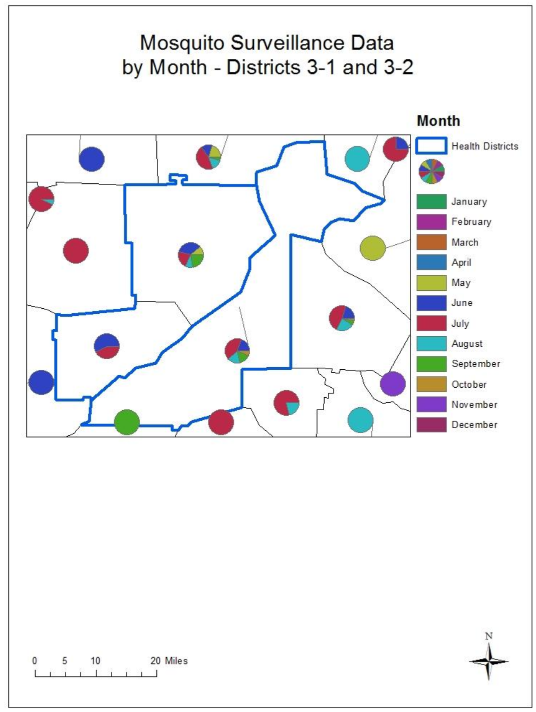
Ochlerotatus had been originally established as a genus in 1891. It became an aedine subgenus in the 1930s, but in 2000 John Reinert and his colleagues elevated the subgenus *Ochlerotatus* back to a genus based upon microscopic differences in the male genitalia between it and other subgenera of *Aedes*. However, in 2005 the *Journal of Medical Entomology* and the Entomological Society of America decided to put *Ochlerotatus* back to subgenera level (http://www.entsoc.org/Pubs/Periodicals/JME/mosquito_name_policy). After a contentious worldwide debate regarding the effect the taxonomic changes would have on names established over decades of work in scientific, government and lay communities, many scientists (including those at the CDC) and others affected by the change espoused the continued use of the previously established names. So, for the time being, everything is *Aedes* again.

HOWEVER, since the GDPH mosquito surveillance database was established after *Ochlerotatus* was elevated to genus status, we appreciate you continuing to use *Ochlerotatus* to make data access easier.

VSC Districts

Districts 3-1 & 3-2:





The Vector Surveillance Coordinator in District 3-1 and 3-2 is Kathleen Schmidt, who is housed at the Cobb County District public health office. Fulton County (District 3-2) also contracts with Clarke, a mosquito control products and services company.

Surveillance was conducted from June through October, and a total of 20 species were reported from Fulton County, including a first report of the invasive species *Culex coronator*. No *Aedes aegypti* were reported from Fulton County. The primary species reported were *Ae albopictus* and *Culex quinquefasciatus*, both container breeders. However, our surveillance is designed to detect those two vector species, so the data are somewhat skewed.

Culex coronator, a mosquito species common to the American tropics, has been recently documented from a number of temperate areas in the US. It was first detected in Georgia from Dougherty County in 2006. Although *Cx coronator* is not usually considered to be a species of major health importance, several pathogens, including WNV, have been isolated from field-collected females.

VSC DISTRICTS

Surveillance in Cobb County was conducted from May through September, and a total of 10 species were collected, including a first report of the invasive species *Culex coronator*. No *Aedes aegypti* were reported from Cobb County. The primary species reported were *Ae albopictus* and *Ae vexans*, a floodwater species.

Surveillance in Douglas County was conducted in June and July, and a total of 10 species were collected. No *Aedes aegypti* were reported from Douglas County. The primary species reported were *Anopheles punctipennis* and *Cx quinquefasciatus*, but only low numbers of all species were captured.

Ochlerotatus japonicus was reported from Districts 3-1 and 3-2; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from Cobb and Fulton counties; this invasive species is primarily found below the Fall Line.

VSC DISTRICTS

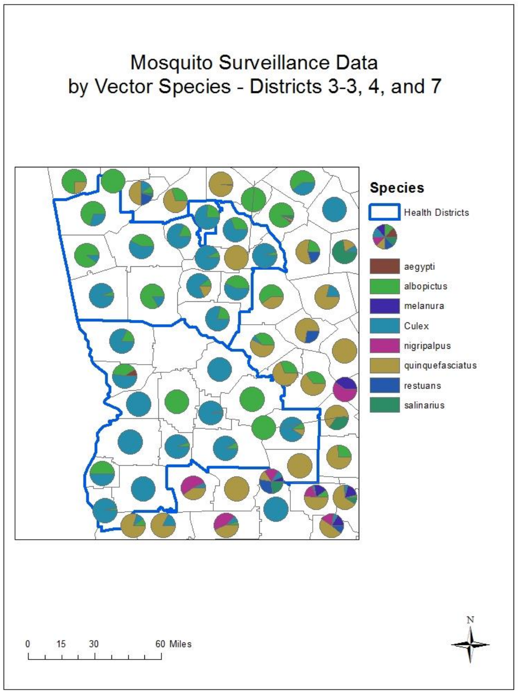
District 3-1		Trap type			
County	**Species**	**BG**	**CDC**	**Gravid**	**Grand Total**
Cobb	*Ae. albopictus*	3	86	2	91
	Ae. vexans		33	2	35
	Aedes/Ochlerotatus spp.		9		9
	An. punctipennis		18		18
	Cq. perturbans		3		3
	Culex spp.		6		6
	Cx. coronator		2		2
	Cx. erraticus		2		2
	Cx. quinquefasciatus		1	13	14
	Cx. restuans		1		1
	Oc. japonicus		1	2	3
	Ps. ferox		1		1
	unknown	1	21		22
Douglas	*Ae. albopictus*		2		2
	Ae. vexans		3		3
	Aedes/Ochlerotatus spp.		15		15
	An. crucians		3		3
	An. punctipennis		10		10
	An. punctipennis (male)		2		2
	Anopheles spp.		3		3
	Cq. perturbans		3		3
	Culex spp.		3		3
	Cx. erraticus		2		2
	Cx. quinquefasciatus		10		10
	Cx. restuans		4		4
	Cx. salinarius		1		1
	Oc. japonicus		4		4
	unknown		9		9
Grand Total		**4**	**258**	**19**	281

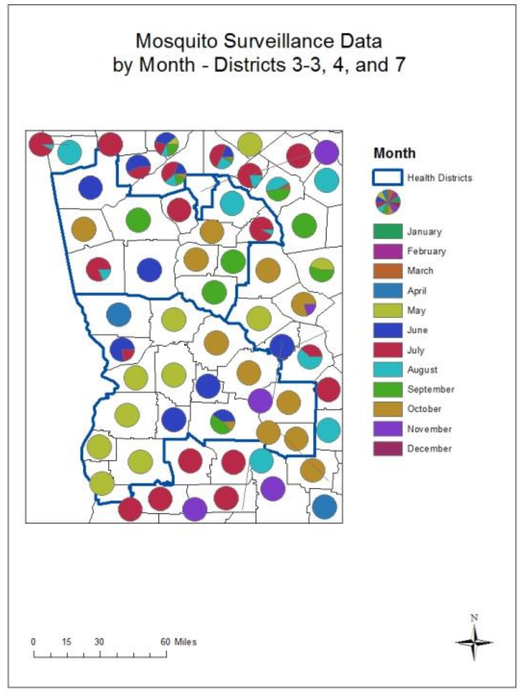
VSC DISTRICTS

District 3-2 (Fulton County)	Trap type			
Species	**BG**	**CDC**	**Gravid**	**Grand Total**
Ae. albopictus	954	102	365	**1421**
Ae. vexans	1	31	8	**40**
Aedes/Ochlerotatus spp.	6	16	1	**23**
An. crucians		7		**7**
An. punctipennis	1	5	1	**7**
An. quadrimaculatus	1		1	**2**
Anopheles spp.		1	1	**2**
Cq. perturbans		6	1	**7**
Culex spp.		7	1	**8**
Cx. coronator		2		
Cx. erraticus	14	4	51	**69**
Cx. quinquefasciatus	312	92	3020	**3424**
Cx. restuans	7	1	4	**12**
Cx. salinarius	7	3	24	**34**
Oc. atlanticus	1			**1**
Oc. japonicus	1	2		**3**
Oc. sollicitans		1		
Oc. triseriatus	11	6	11	**28**
Or. signifera	1		2	**3**
Ps. ciliata	1			**1**
Ps. columbiae	1		1	**2**
Ps. ferox	4	4		**8**
Tx. rutilus	11		5	**16**
unknown		6		**6**
Grand Total	**1334**	**296**	**3497**	**5127**

VSC DISTRICTS

Districts 3-3, 4-0, and 7-0:





The Vector Surveillance Coordinator in District 3-3, 4-0, and 7-0 is Hanje Woodson, who is housed at the Spalding County Environmental Health office. Muscogee County (District 7-0) also has a mosquito control program within the Public Health Department in Environmental Health.

Surveillance was conducted in July and August, and a total of 4 species were reported from Clayton County (District 3-3). No *Aedes aegypti* were reported. The primary species reported was unidentified *Culex* spp, although those caught in gravid traps are likely *Cx quinquefasciatus*.

Surveillance in District 4 was conducted from June through October, and a total of 6 species were collected. No *Aedes aegypti* were reported. The primary species reported were *Ae albopictus* and unidentified *Culex spp,* many of which are likely *Cx quinquefasciatus*. *Ochlerotatus japonicus* was reported from District 4; this invasive species is primarily found above the Fall Line.

Surveillance in District 7-0 was conducted from April through October, and a total of 7 species were collected. *Aedes aegypti* were reported from Muscogee County; this is the only location in the state where this species was found. The primary species reported were *Ae vexans* and

Cx quinquefasciatus. *Ochlerotatus japonicus* was also reported from District 7; this invasive species is primarily found above the Fall Line.

District 3-3 (Clayton County)	Trap types		
Species	**CDC**	**Gravid**	**Grand Total**
Ae. albopictus	21	17	**38**
An. punctipennis	4		**4**
Anopheles spp.	3		**3**
Culex spp.	20	99	**119**
Oc. japonicus	4		**4**
Grand Total	**52**	**116**	**168**

District 4-0		Trap types		
County	***Species***	**CDC**	**Gravid**	**Grand Total**
Butts	*Ae. albopictus*	3		3
	Ae. vexans	2		2
	Culex spp.	16	44	60
	Oc. japonicus	75		75
Carroll	*Ae. albopictus*	75	19	94
	Ae. vexans	2		2
	An. punctipennis	4		4
	Culex spp.	15	24	39
Coweta	*Ae. albopictus*	8		8
	Ae. vexans	2	3	5
	Culex spp.		11	11
Fayette	*Ae. albopictus*	7	8	15
	An. punctipennis	3		3
	Anopheles spp.	1		1
	Culex spp.	16	52	68
Heard	*Ae. albopictus*	88	7	95
	Ae. vexans	2		2
	An. crucians	1		1
	An. punctipennis	2		2
	Culex spp.	3	8	11

VSC DISTRICTS

	Oc. japonicus		3	3
Henry	*Ae. albopictus*	2	15	17
	Anopheles spp.	1		1
	Culex spp.	5	33	38
Lamar	*Ae. albopictus*	19	18	37
	An. punctipennis	1		1
	Culex spp.	5	43	48
	Oc. japonicus	3		3
Meriwether	*Ae. albopictus*	2	43	45
	Anopheles spp.	4		4
	Culex spp.	5	4	9
Pike	*Ae. albopictus*		3	3
	Ae. albopictus (male)	1		1
	Ae. vexans	2		2
	An. punctipennis	1		1
	Culex spp.	6	18	24
	Cx. quinquefasciatus	6		6
	Oc. japonicus	1	1	2
Spalding	*Ae. albopictus*		1	1
	Ae. vexans	26		26
	Culex spp.		12	12
Troup	*Ae. albopictus*	5		5
	Ae. vexans	2		2
	Culex spp.	50	32	82
Upson	*Ae. albopictus*	7	5	12
	Ae. vexans	47		47
	Culex spp.	7	38	45
	Oc. japonicus		9	9
Grand Total		**533**	**454**	987

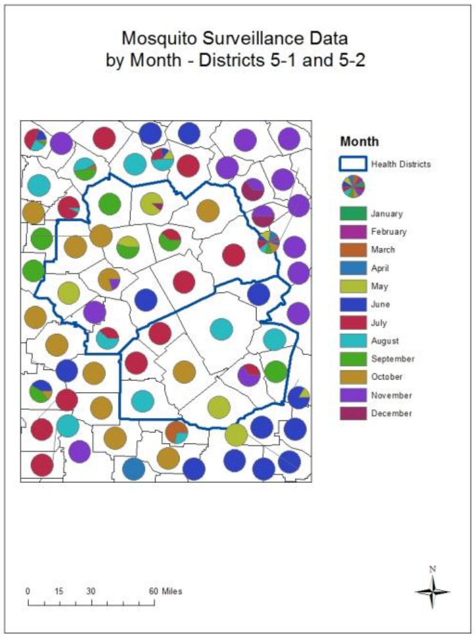
VSC DISTRICTS

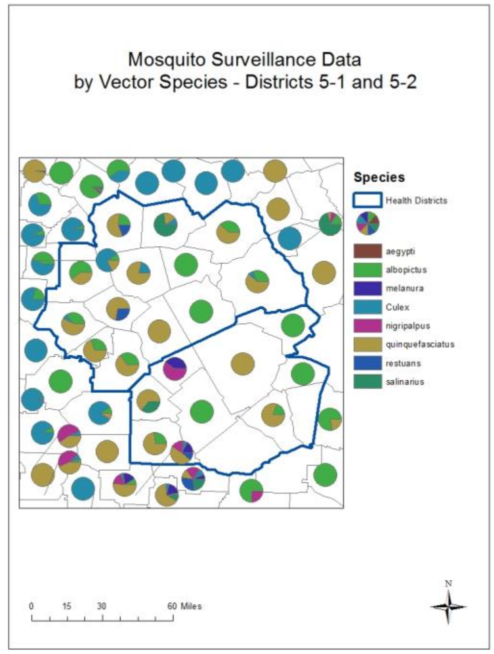
District 7-0		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Chattahoochee	*Ae. vexans*		1	1
	Anopheles spp.	2		2
	Culex spp.		3	3
Clay	*Ae. albopictus*		1	1
	An. crucians	4		4
	Culex spp.	4	27	31
Crisp	*Ae. albopictus*		2	2
	Ae. vexans	192	46	238
	Culex spp.	9		9
	Cx. quinquefasciatus	779	137	916
	Oc. japonicus	1		1
Dooly	*Ae. albopictus*	2	2	4
	An. punctipennis	8		8
	Culex spp.	4	34	38
	Cx. quinquefasciatus	4		4
	Oc. japonicus	2		2
Harris	*Ae. albopictus*	4	6	10
	Ae. vexans	12		12
	Anopheles spp.	18		18
	Culex spp.	11	36	47
Macon	*Ae. albopictus*	1	11	12
	Ae. vexans	28		28
	An. crucians	1		1
Marion	*Ae. albopictus*	2		2
	Anopheles spp.	9		9
Muscogee	*Ae. aegypti*	32		32
	Ae. albopictus	91	33	124
	Ae. vexans	14		14
	An. punctipennis	10		10
	Culex spp.	112	61	173
Quitman	*Ae. albopictus*	1		1
	An. punctipennis	1		1
	Culex spp.	1		1
Randolph	*An. crucians*	3		3
	Culex spp.	3	5	8

Schley	*Ae. albopictus*		3	3
	Culex spp.	43	98	141
Stewart	*An. crucians*	3		3
	Culex spp.	2		2
Sumter	*Ae. albopictus*	11	3	14
	Ae. vexans	30	2	32
	An. punctipennis	2		2
	Culex spp.	7	143	150
Talbot	*Ae. vexans*	42		42
	Anopheles spp.	1		1
Taylor	*Anopheles spp.*	1		1
	Culex spp.	2	4	6
Webster	*Ae. albopictus*		5	5
	Culex spp.		87	87
Grand Total		**1509**	**750**	2259

VSC DISTRICTS

Districts 5-1 and 5-2:





The Vector Surveillance Coordinator in District 5-1 and 5-2 is Tremayne Mitchell, who is housed at the District 5-2 public health office in Macon. Environmental Health Specialists in District 5-2 have also been involved in mosquito surveillance to follow-up Zika cases.

Surveillance was conducted from May through November, and a total of 13 species were reported from District 5-1. No *Aedes aegypti* were reported. The primary species reported was *Cx quinquefasciatus*. *Ochlerotatus japonicus* was reported from District 5-1; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from District 5-1; this invasive species is primarily found below the Fall Line.

Surveillance in District 5-2 was done from May through December, and a total of 13 species were collected. No *Aedes aegypti* were reported. The primary species reported were *Ae albopictus* and *Cx quinquefasciatus*. *Ochlerotatus japonicus* was reported from District 5-2; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from District 5-2; this invasive species is primarily found below the Fall Line.

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District 5-1		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Bleckley	*Cs. melanura*	6		6
	Cx. erraticus	1		1
	Cx. nigripalpus	9		9
Dodge	*Ae. albopictus*		7	7
	Ae. vexans		18	18
	Ps. ferox		4	4
	unknown		2	2
Johnson	*Ae. albopictus*	9		9
	Cx. erraticus	16		16
	Ps. columbiae	2		2
Laurens	*Cx. coronator*		9	9
	Cx. quinquefasciatus	16		16
	unknown		6	6
Montgomery	*Anopheles spp.*		7	7
	Oc. japonicus	13		13
	unknown	9		9
Pulaski	*Cx. quinquefasciatus*	11		11
	Cx. salinarius	6		6
	unknown	2		2
Telfair	*Cq. perturbans*		4	4
	Cx. coronator		9	9
Treutlen	*Ae. albopictus*	3		3
	Cx. erraticus	9		9
	Ps. columbiae	3		3
Wheeler	*Ae. albopictus*	9		9
	Ae. vexans	3		3
	Anopheles spp.	6		6
	Cx. erraticus	6		6
	Cx. quinquefasciatus	13	23	36
	unknown	1		1
Wilcox	*Ae. albopictus*		4	4
	Anopheles spp.	6		6
	Cx. quinquefasciatus	11		11

	unknown		2	2
Grand Total		**170**	**95**	265

District 5-2

		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Baldwin	*Ae. albopictus*	11	11	22
	Cx. erraticus	6	18	24
	Ps. columbiae	3		3
Bibb	*Ae. albopictus*	4		4
	Ae. vexans		9	9
	Anopheles spp.	13		13
	Cx. quinquefasciatus		36	36
	Cx. restuans		14	14
	Oc. japonicus	17	2	19
	unknown	2		2
Crawford	*Ae. albopictus*	7	4	11
	Anopheles spp.	6	11	17
	Culex spp.		2	2
	Cx. quinquefasciatus	9	9	18
Hancock	*Ae. albopictus*		11	11
	Cx. quinquefasciatus		18	18
	Oc. japonicus		1	1
Houston	*Ae. albopictus*	6	1	7
	Anopheles spp.		2	2
	Cx. coronator		6	6
	Cx. erraticus		6	6
	Cx. quinquefasciatus		13	13
Jasper	*Ae. albopictus*	7		7
	Cx. quinquefasciatus		17	17
	Cx. restuans		6	6
Jones	*Anopheles spp.*	11		11
	Cq. perturbans		8	8
	Culex spp.		4	4
	Cx. quinquefasciatus	9	6	15
	unknown	2		2

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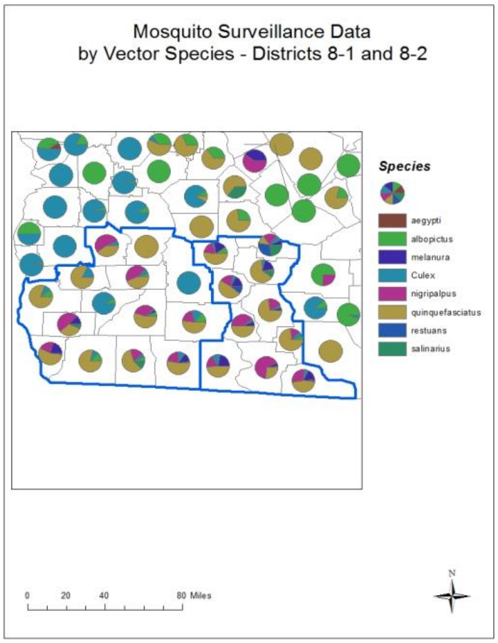
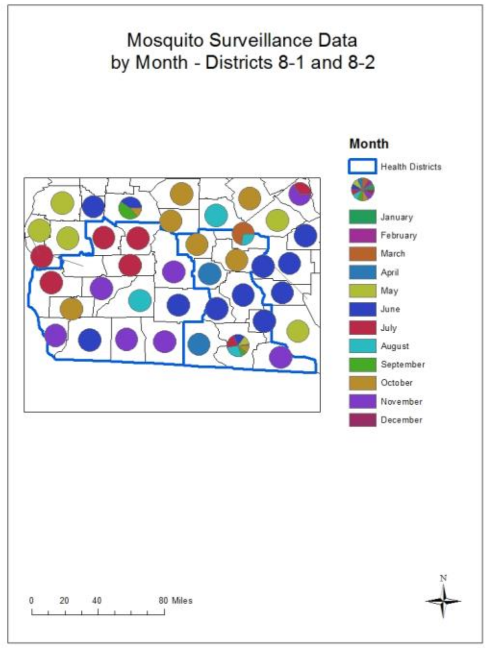
Monroe	*Ae. albopictus*		16	16
	Ae. vexans	9		9
	Cx. quinquefasciatus	11		11
	Ps. ferox		4	4
Peach	*Ae. albopictus*	4		4
	Cx. quinquefasciatus		9	9
	unknown	1		1
Putnam	*Cq. perturbans*		5	5
	Culex spp.		2	2
	Cx. coronator	1	9	10
	Cx. quinquefasciatus	3	1	4
	Cx. salinarius	16		16
Twiggs	*Cx. quinquefasciatus*	11		11
	Ur. sapphirina	8		8
Washington	*Ae. albopictus*	8		8
	Anopheles spp.		4	4
	Culex spp.	2		2
	Cx. quinquefasciatus		28	28
	unknown	2		2
Wilkinson	*Ae. albopictus*	6		6
	Anopheles spp.	4		4
Grand Total		**199**	**293**	**492**

VSC DISTRICTS

Districts 8-1 and 8-2:





The Vector Surveillance Coordinator in District 8-1 and 8-2 is Napolean Butler, who is housed at the Dougherty County Environmental Health office. Lowndes County (District 8-1) also contracts with Valdosta State University (VSU) to conduct mosquito surveillance; VSU shares their data with the State EH office, although only data sent for testing are reported.

Surveillance was conducted from March through November, and a total of 17 species were reported from District 8-1. No *Aedes aegypti* were reported. The primary species reported were *Cx quinquefasciatus* and *Cx nigripalpus*. *Culex coronator* was also reported from District 8-1; this invasive species is primarily found below the Fall Line.

Surveillance in District 8-2 was conducted from June through August and in October and November, and a total of 12 species were collected. No *Aedes aegypti* were reported. The primary species reported was *Cx quinquefasciatus*. *Culex coronator* was reported from District 8-2; this invasive species is primarily found below the Fall Line.

District 8-1		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Ben Hill	*Ae. vexans*	3		3

	An. crucians	17		17
	An. punctipennis	1		1
	Cq. perturbans	2		2
	Cs. melanura		4	4
	Culex spp.	3	3	6
	Cx. erraticus	3		3
	Cx. nigripalpus	9	3	12
	Cx. quinquefasciatus		8	8
	Cx. restuans		18	18
	Cx. salinarius	15		15
Berrien	*Ae. vexans*	2		2
	An. crucians	1		1
	An. punctipennis	2		2
	Cq. perturbans	10	7	17
	Cs. melanura		2	2
	Culex spp.		2	2
	Culex spp. (male)		2	2
	Cx. nigripalpus	6	4	10
	Cx. quinquefasciatus		37	37
Brooks	*Cs. melanura*	2	8	10
	Culex spp.	1	4	5
	Cx. nigripalpus	8		8
	Cx. quinquefasciatus		22	22
Cook	*Cq. perturbans*	17		17
	Cs. melanura	6		6
	Culex spp.		3	3
	Culex spp. (male)		2	2
	Cx. nigripalpus	24	13	37
	Cx. quinquefasciatus	3	42	45
Echols	*Ae. albopictus*		2	2
	Cq. perturbans	2		2
	Cs. melanura	15	5	20
	Culex spp.		7	7
	Cx. nigripalpus	21	13	34
	Cx. quinquefasciatus	12	43	55
	Cx. restuans		2	2
Irwin	*Ae. albopictus*	2		2

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	Cs. melanura	3	9	12
	Culex spp.	1	2	3
	Cx. quinquefasciatus		42	42
	Cx. salinarius		6	6
Lanier	*Ae. albopictus*		3	3
	Cq. perturbans	4		4
	Culex spp.		5	5
	Culex spp. (male)		1	1
	Cx. erraticus	3	5	8
	Cx. nigripalpus	9		9
	Cx. quinquefasciatus		49	49
Lowndes	*Ae. albopictus*	250	278	528
	Ae. vexans	1		1
	Cq. perturbans	1579		1579
	Cs. melanura	1304	13	1317
	Cx. coronator	276	13	289
	Cx. erraticus	1	1	2
	Cx. nigripalpus	15860	3848	19708
	Cx. quinquefasciatus	156	7194	7350
	Cx. restuans	1	59	60
	Ma. titillans	91		91
	Oc. atlanticus	1		1
	Oc. canadensis	1		1
	Oc. triseriatus		8	8
	Ur. lowii	1		1
Tift	*Cq. perturbans*	14		14
	Cs. melanura	9		9
	Culex spp.		3	3
	Cx. nigripalpus		10	10
	Cx. quinquefasciatus		26	26
	Cx. restuans		6	6
Turner	*Ae. albopictus*	3	9	12
	Cs. melanura	14	8	22
	Culex spp.	1	3	4
	Cx. nigripalpus	14	8	22
	Cx. quinquefasciatus	6	57	63
Grand Total		**19790**	**11922**	31712

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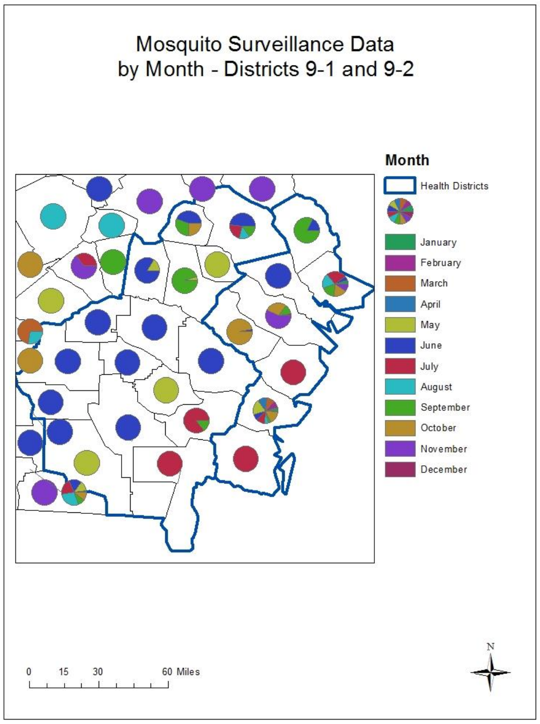
District 8-2

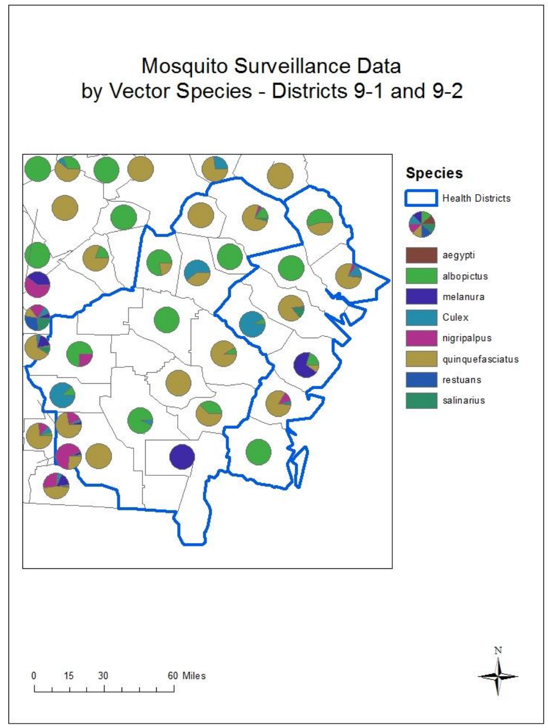
County	Species	CDC	Gravid	Grand Total
		Trap types		
Baker	*Ae. albopictus*		2	2
	An. punctipennis		1	1
	Culex spp.	4	24	28
Calhoun	*Ae. vexans*	1		1
	An. punctipennis	4		4
	Culex spp.	1	2	3
	Culex spp. (male)		1	1
	Cx. erraticus	2		2
	Cx. quinquefasciatus		14	14
Colquitt	*Ae. albopictus*		14	14
	Cq. perturbans	13		13
	Culex spp.	5	11	16
	Cx. nigripalpus	22		22
	Cx. quinquefasciatus		55	55
Decatur	*Ae. albopictus*	11		11
	Ae. albopictus (male)	2		2
	Ae. vexans	3		3
	Culex spp.	5	3	8
	Culex spp. (male)		2	2
	Cx. quinquefasciatus	16	55	71
Dougherty	*Ae. albopictus*	4		4
	Culex spp.	3	3	6
	Cx. nigripalpus	26	7	33
	Cx. quinquefasciatus		34	34
Early	*Ae. albopictus*		2	2
	Ae. vexans	2		2
	An. punctipennis	1		1
	Culex spp.		2	2
	Cx. erraticus	5		5
	Cx. quinquefasciatus		16	16
Grady	*Ae. albopictus*	2		2
	Culex spp.		2	2
	Cx. nigripalpus		7	7

	Cx. quinquefasciatus		22	22
	Cx. salinarius	5		5
Lee	*Ae. vexans*	2		2
	An. punctipennis	10		10
	Culex spp. (male)		1	1
	Cx. coronator	1		1
	Cx. erraticus	3		3
	Cx. quinquefasciatus	3	53	56
Miller	*Cs. melanura*	4		4
	Cx. nigripalpus	13	2	15
	Cx. quinquefasciatus		10	10
	Cx. salinarius	2		2
Mitchell	*Ae. albopictus*	9		9
	Ae. albopictus (male)	1		1
	Cs. melanura	3		3
	Culex spp.		4	4
	Culex spp. (male)		2	2
	Cx. nigripalpus	27	11	38
	Cx. quinquefasciatus	12	54	66
Seminole	*Cs. melanura*	14	4	18
	Cx. nigripalpus	5	14	19
	Cx. quinquefasciatus		50	50
	Cx. restuans		1	1
Terrell	*Cq. perturbans*	14		14
	Culex spp.	2	2	4
	Culex spp. (male)	2		2
	Cx. nigripalpus	32		32
	Cx. quinquefasciatus	2	22	24
Thomas	*Ae. albopictus*	1		1
	Cs. melanura	3	4	7
	Culex spp.	1	4	5
	Cx. nigripalpus	12		12
	Cx. quinquefasciatus		28	28
Worth	*Ae. vexans*	1		1
	Culex spp.	6	21	27
Grand Total		**322**	**566**	888

VSC DISTRICTS

Districts 9-1 and 9-2:





The Vector Surveillance Coordinator in District 9-1 and 9-2 is Misty McKanna. Misty is housed at the Evans County Environmental Health office. Chatham County (District 9-1) has a stand-alone mosquito control program that conducts surveillance and shares those data with the local Health Department and the State EH office, although only data sent for testing are reported. Glynn County contracts with Mosquito Control Services, who also share data sent for testing with the State EH office. Liberty County, and the city of Hinesville within Liberty County, both have mosquito control programs. While they have done surveillance in the past and shared those data, no data were shared in 2017. The city of Statesboro (and the Statesboro Public Works Department) in Bulloch County contracted with Georgia Southern University College of Public Health to provide surveillance. These data were shared with Public Works, who provide mosquito control in Statesboro, and the State EH office.

Surveillance was conducted from January through December, and a total of 24 species were reported from District 9-1. No *Aedes aegypti* were reported. The primary species reported was *Cx quinquefasciatus*. However, Chatham County does a great deal of surveillance, and the data provided to the State EH office are those for vector species only, so the data are somewhat skewed. *Culex coronator* was reported from District 9-1; this invasive species is primarily found below the Fall Line.

Surveillance in District 9-2 was conducted from May through October, and a total of 32 species were collected. No *Aedes aegypti* were reported. The primary species reported was *Cx quinquefasciatus*. *Culex coronator* was reported from District 9-2; this invasive species is primarily found below the Fall Line.

District 9-1			Trap types			
County	**Species**	**BG**	**CDC**	**Exit**	**Gravid**	**Grand Total**
BRYAN	*Ae. albopictus*				2	2
	Cx. coronator				2	2
CAMDEN	*Ae. albopictus*		16			16
	Anopheles spp.		10			10
	Cx. erraticus		206			206
	Psorophora spp.		4			4
CHATHAM	*Ae. albopictus*	81			5	86
	Ae. vexans		245			245
	An. crucians		54			54
	Cq. perturbans		7			7
	Cs. melanura		323	128	5	456
	Culex spp.		28		5827	5855
	Cx. coronator		6			6
	Cx. erraticus		1282	29	4	1315
	Cx. nigripalpus		1164		1349	2513
	Cx. quinquefasciatus		3		34718	34721
	Cx. restuans		2		24	26
	Cx. salinarius		659			659
	Oc. atlanticus		243			243
	Oc. infirmatus		45			45
	Ps. ciliata		2			2
	Ps. columbiae		12			12
	Ur. sapphirina		1			1
EFFINGHAM	*Ae. albopictus*				6	6
	An. crucians		12			12
	Culex spp. (male)				1	1

	Cx. erraticus		9			9
	Cx. quinquefasciatus		1		4	5
	Ps. columbiae		2			2
GLYNN	*Ae. albopictus*		32		186	218
	Ae. albopictus (male)				22	22
	An. crucians		24		5	29
	Anopheles spp.				1	1
	Anopheles spp. (male)				4	4
	Culex spp.		730			730
	Cx. coronator		1			1
	Cx. nigripalpus		1431		1906	3337
	Cx. quinquefasciatus		13		20072	20085
	Cx. restuans		1			1
	Cx. salinarius		364			364
	Oc. fulvus pallens		30			30
	Oc. infirmatus		5			5
	Oc. taeniorhynchus		453			453
	Or. signifera		2		4	6
	Ps. ferox				2	2
LIBERTY	*Ae. albopictus*		34		1	35
	Ae. cinereus		75			75
	Ae. vexans		54			54
	Aedes/Ochlerotatus spp.		78			78
	An. crucians		241		1	242
	An. quadrimaculatus		1			1
	Anopheles spp.		9			9
	Anopheles spp. (male)		12			12
	Culex spp.		39			39
	Culex spp. (male)		4		3	7
	Cx. quinquefasciatus		2336		72	2408
	Cx. salinarius		377			377
	Oc. atlanticus		15			15
	Oc. sollicitans		5			5
	Oc. triseriatus		4			4
	Or. signifera		8			8
	Ps. ciliata		6			6
	Ps. ferox		6			6

	unknown		58		21	79
LONG	*Ae. albopictus*				1	1
	Aedes/Ochlerotatus spp.		19		11	30
	Anopheles spp.		21			21
	Culex spp.		13		1	14
	Oc. sollicitans		2			2
	unknown				1	1
MCINTOSH	*Ae. albopictus*				4	4
	Cs. melanura		14			14
	Cx. erraticus				4	4
	Cx. quinquefasciatus				2	2
	Oc. taeniorhynchus		6			6
Grand Total		**81**	**10859**	**157**	**64271**	**75368**

District 9-2		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Appling	*Ae. albopictus*	1		**1**
	An. crucians	1		**1**
	Cq. perturbans	4		**4**
	Culiseta spp.	12		**12**
	Tx. rutilus	1		**1**
ATKINSON	*Ae. albopictus*		7	**7**
	Culex spp.	53		**53**
	Oc. fulvus pallens	2		**2**
	Or. signifera	38	2	**40**
BACON	*An. punctipennis*	16		**16**
	unknown	10		**10**
BRANTLEY	*Ae. albopictus*		3	**3**
	Anopheles spp. (male)		4	**4**
	Cx. quinquefasciatus		5	**5**
	Ps. columbiae		2	**2**
Bulloch	*Ae. albopictus*	110	123	**233**
	Ae. albopictus (male)		5	**5**
	Ae. vexans	15	3	**18**
	Aedes/Ochlerotatus spp.	40		**40**
	An. crucians	29	3	**32**

	An. punctipennis	38		**38**
	An. punctipennis (male)	1		**1**
	An. quadrimaculatus	16		**16**
	Anopheles spp.	12		**12**
	Anopheles spp. (male)	5		**5**
	Cq. perturbans	28	17	**45**
	Cs. melanura	4	11	**15**
	Culex spp.	21	4	**25**
	Culex spp. (male)		6	**6**
	Cx. coronator	119	11	**130**
	Cx. erraticus	3	4	**7**
	Cx. nigripalpus	51		**51**
	Cx. quinquefasciatus	329	819	**1148**
	Cx. quinquefasciatus (male)		6	**6**
	Cx. restuans	7	1	**8**
	Cx. salinarius	65		**65**
	Cx. territans	17	21	**38**
	Ma. dyari	3		**3**
	Oc. sollicitans	21		**21**
	Oc. sticticus	16		**16**
	Oc. taeniorhynchus	2		**2**
	Oc. triseriatus	3	4	**7**
	Or. signifera	6	2	**8**
	Ps. ciliata	24		**24**
	Ps. columbiae	94	2	**96**
	Ps. ferox	67		**67**
	Ps. howardii	3		**3**
	Ps. howardii (male)	3		**3**
	Psorophora spp.	5		**5**
	Tx. rutilus		1	**1**
	unknown	12	2	**14**
	Ur. sapphirina	1		**1**
CANDLER	*Ae. vexans*		14	**14**
	Aedes/Ochlerotatus spp.	7		**7**
	An. crucians	2		**2**
	Cx. quinquefasciatus	39	34	**73**
	Oc. trivittatus	1		**1**

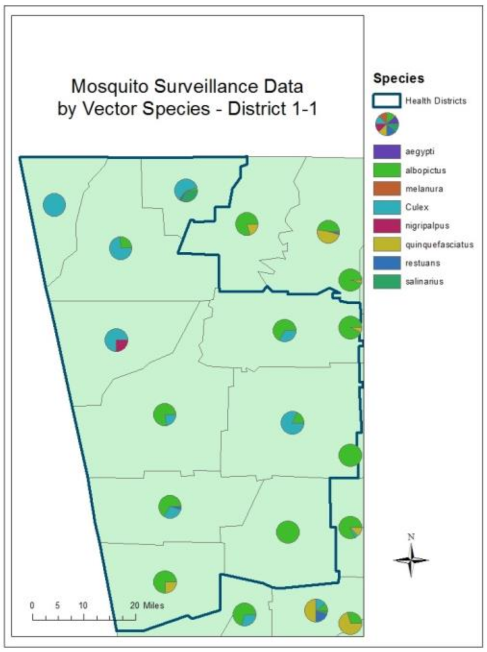
	Or. signifera		1	**1**
	Ps. cyanescens	3		**3**
	Ps. ferox	3		**3**
	Ps. howardii	1		**1**
	Ur. sapphirina	1		**1**
CHARLTON	*Ae. albopictus*	1		**1**
	An. crucians	11		**11**
	Anopheles spp. (male)	3		**3**
	Cq. perturbans	27		**27**
	Cs. melanura	212		**212**
	Cx. erraticus	10		**10**
	Cx. salinarius	2		**2**
	Oc. atlanticus	25		**25**
	Oc. fulvus pallens	1		**1**
	Oc. taeniorhynchus	25		**25**
	Or. signifera	29		**29**
	Ps. columbiae	64		**64**
Clinch	*Cx. quinquefasciatus*		56	**56**
COFFEE	*Ae. albopictus*		3	**3**
	Ae. vexans	11		**11**
	Cq. perturbans	1		**1**
	Cs. inornata		3	**3**
	Cx. erraticus		6	**6**
	Cx. nigripalpus	1		**1**
Evans	*Ae. albopictus*		1	**1**
	Cq. perturbans		11	**11**
Jeff Davis	*Cq. perturbans*	11		**11**
	Oc. fulvus pallens	3		**3**
	Ps. columbiae	5		**5**
	Ps. discolor	5		**5**
Pierce	*Cx. quinquefasciatus*		8	**8**
Tattnall	*Ae. vexans*	3		**3**
	Aedes/Ochlerotatus spp.	1		**1**
	Anopheles spp.	7		**7**
	Culex spp.	6		**6**
	Cx. erraticus	42		**42**
	Cx. quinquefasciatus		4	**4**

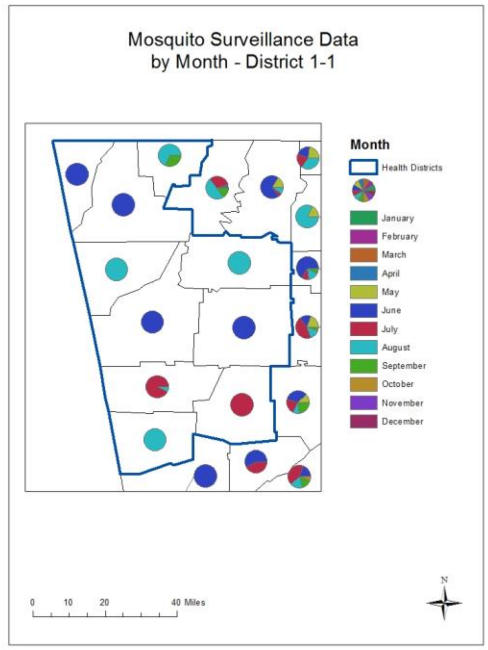
	Or. signifera	3		**3**
	Ps. columbiae	5		**5**
	Ps. ferox	1		**1**
	unknown	5		**5**
Toombs	*Ae. albopictus*		7	**7**
	An. punctipennis		1	**1**
	Cx. coronator		3	**3**
	Cx. erraticus		11	**11**
	Cx. quinquefasciatus		2	**2**
WARE	*Ae. albopictus*	1	14	**15**
	An. crucians	3		**3**
	Cq. perturbans	4		**4**
	Cs. inornata	8		**8**
	Culex spp.		1	**1**
	Oc. fulvus pallens	1		**1**
WAYNE	*Ae. albopictus*	1		**1**
	Cx. quinquefasciatus	11		**11**
Grand Total		**1914**	**1248**	**3162**

NON-VSC DISTRICTS

Non-VSC Districts

District 1-1:





There is no Vector Surveillance Coordinator in District 1-1; local Environmental Health Specialists (EHS) conducted surveillance throughout the District. Surveillance was conducted from June through September, and a total of 19 species were reported from District 1-1. No *Aedes aegypti* were reported. The primary species reported was *Aedes vexans,* a floodwater species that emerges within 7-10 after heavy rains. *Ochlerotatus japonicus* was reported from District 1-1; this invasive species is primarily found above the Fall Line.

NON-VSC DISTRICTS

District 1-1		Trap types		
County	**Species**	**CDC**	**Gravid**	Grand Total
Bartow	*Ae. albopictus*		2	2
	Ae. vexans		1	1
	An. punctipennis	1		1
	Culex spp.	1	8	9
	Oc. japonicus	2		2
Catoosa	*Ae. albopictus*	7		7
	Ae. vexans	95		95
	Culex spp.	99		99
	Cx. quinquefasciatus	2		2
	Cx. restuans	4		4
	Cx. salinarius	54		54
	Oc. fulvus pallens	2		2
	Oc. infirmatus	22		22
	Or. signifera	11		11
	Ur. sapphirina	6		6
Chattooga	*Ae. vexans*	11	5	16
	Culex spp.	4	2	6
	Cx. erraticus	2		2
	Cx. nigripalpus	2		2
Dade	*Ae. vexans*	3	7	10
	Culex spp.	3	6	9
	Oc. infirmatus	2		2
	Ps. columbiae	11		11
	Ps. ferox	9		9
Floyd	*Ae. albopictus*	11	13	24
	Ae. vexans	5	1	6
	An. punctipennis	2		2
	Culex spp.		7	7
	Oc. japonicus		8	8
	Oc. sticticus	11		11
Gordon	*Ae. albopictus*		4	4
	Ae. vexans	1	3	4
	An. crucians	3		3
	Culex spp.	2		2

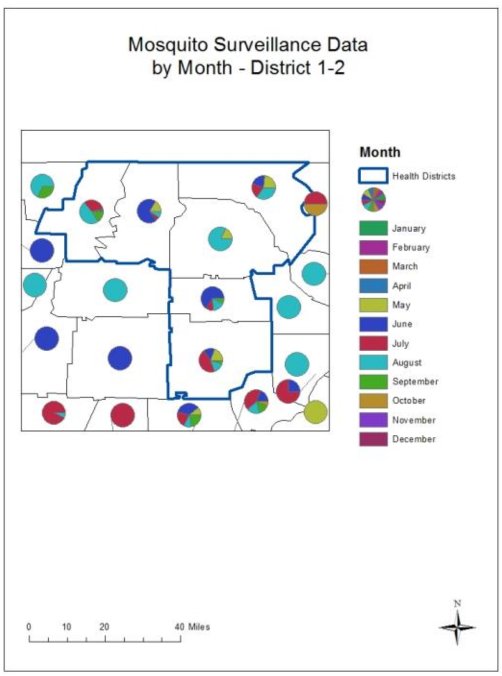
NON-VSC DISTRICTS

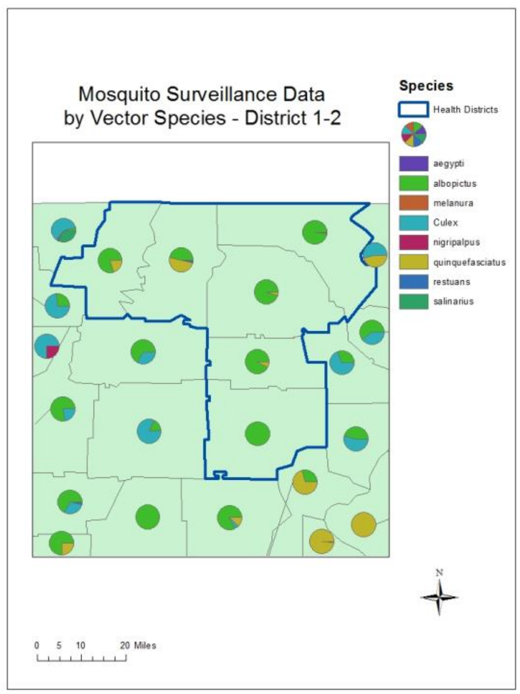
Haralson	*Ae. albopictus*	6	3	9
	Ae. vexans	4	1	5
	An. punctipennis	2		2
	Cx. quinquefasciatus	2	1	3
Paulding	*Ae. albopictus*	3	6	9
	Ae. vexans	3		3
	Aedes/Ochlerotatus spp.	1		1
	Cx. territans	1	1	2
	Oc. japonicus		1	1
	Oc. sticticus	1		1
Polk	*Ae. albopictus*	37	41	78
	Ae. vexans	26		26
	An. punctipennis	1		1
	An. quadrimaculatus		2	2
	Culex spp.	8	26	34
	Cx. quinquefasciatus		1	1
	Cx. restuans	5		5
	Cx. territans	12		12
	Ps. ferox	6		6
Walker	*Ae. albopictus*	7	5	12
	Ae. vexans	96	10	106
	Culex spp.	13	21	34
	Ps. ferox	32		32
Grand Total		**654**	**186**	840

NON-VSC DISTRICTS

District 1-2:

There is no Vector Surveillance Coordinator in District 1-2; the District Environmental Health Director conducted most of the surveillance, with assistance from the local environmental health staff. Surveillance was conducted from June through September, and a total of 19 species were reported from District 1-2. No *Aedes aegypti* were reported. The primary species reported was *Aedes vexans,* a floodwater species that emerges within 7-10 days after heavy rains. *Ochlerotatus japonicus* was reported from District 1-2; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from District 1-2, in Murray County, for the first time; this invasive species is primarily found below the Fall Line.





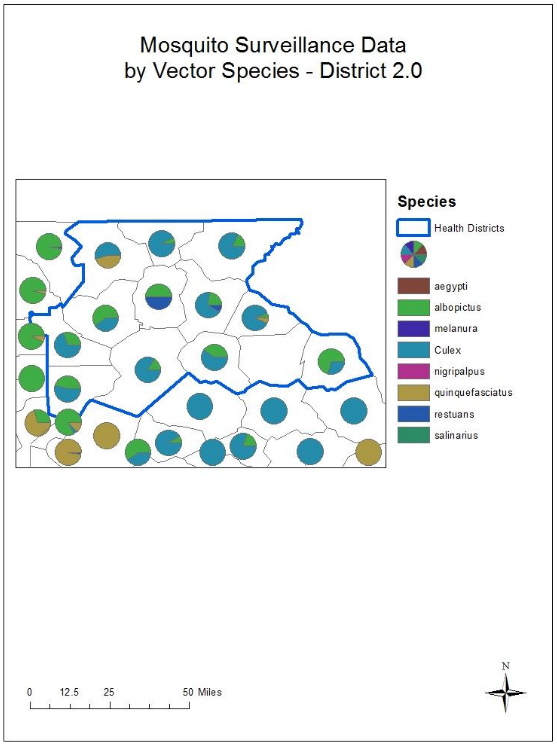
NON-VSC DISTRICTS

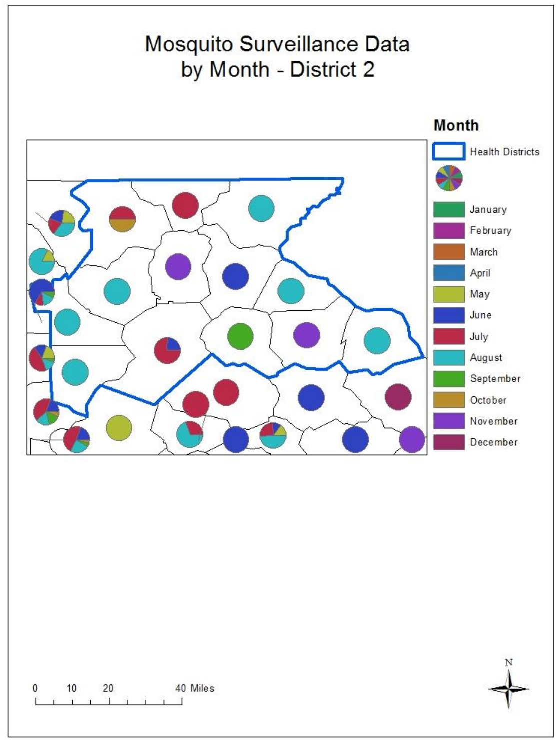
District 1-2		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Cherokee	*Ae. albopictus*	280		280
	Ae. albopictus (male)	23		23
	Ae. vexans	67		67
	An. crucians	3		3
	An. punctipennis	206		206
	An. quadrimaculatus	4		4
	Cs. melanura	1		1
	Cx. erraticus	28		28
	Cx. erraticus (male)	2		2
	Cx. quinquefasciatus	2		2
	Cx. territans	17		17
	Cx. territans (male)	1		1
	Oc. japonicus	3		3
	Oc. sticticus	1		1
	Oc. triseriatus	2		2
	Ps. columbiae	8		8
	Ps. cyanescens	2		2
	Ps. howardii	1		1
Fannin	*Ae. albopictus*	44		44
	Ae. vexans	4		4
	An. punctipennis	40		40
	Cs. melanura	1		1
	Cx. erraticus	21		21
	Oc. japonicus	2		2
	Oc. sticticus	1		1
	Oc. triseriatus	2		2
	Oc. trivittatus	1		1
	Ps. cyanescens	1		1
Gilmer	*Ae. albopictus*	22		22
	Ae. vexans	3		3
	An. punctipennis	8		8
	Cx. quinquefasciatus	1		1
	Oc. japonicus	1		1

Murray	*Ae. albopictus*	59		59
	Ae. cinereus	30		30
	Ae. cinereus (male)	2		2
	Ae. vexans	70		70
	Ae. vexans (male)	4		4
	An. crucians	34		34
	An. punctipennis	180		180
	An. punctipennis (male)	5		5
	An. quadrimaculatus	6		6
	Cx. coronator	22		22
	Cx. coronator (male)	3		3
	Cx. erraticus	69		69
	Cx. erraticus (male)	8		8
	Cx. quinquefasciatus	62		62
	Cx. restuans	3		3
	Cx. salinarius	2		2
	Oc. atlanticus	13		13
	Oc. japonicus	2		2
	Oc. mitchellae	3		3
	Oc. sticticus	4		4
	Oc. trivittatus	483		483
	Oc. trivittatus (male)	2		2
	Ps. ciliata	11		11
	Ps. cyanescens	49		49
	Ps. ferox	80		80
	Ps. mathesoni	9		9
	Ur. sapphirina	2		2
Pickens	*Ae. albopictus*	4	8	12
	Ae. vexans	20		20
	An. crucians	3		3
	An. punctipennis	23		23
	Cx. erraticus	10		10
	Cx. quinquefasciatus	1		1
	Oc. trivittatus	5		5
	Ps. columbiae	1		1
	Ps. cyanescens	1		1
Whitfield	*Ae. albopictus*	357		357

	Ae. albopictus (male)	43		43
	Ae. cinereus	21		21
	Ae. cinereus (male)	12		12
	Ae. vexans	21		21
	An. punctipennis	89		89
	Cq. perturbans	11		11
	Cs. inornata	1		1
	Cx. erraticus	20		20
	Cx. quinquefasciatus	90		90
	Cx. restuans	1		1
	Cx. salinarius	3		3
	Oc. japonicus	31		31
	Oc. triseriatus	6		6
	Or. signifera	2		2
	Ps. ciliata	2		2
	Ps. columbiae	2		2
	Ps. cyanescens	38		38
	Ps. cyanescens (male)	1		1
	Ps. ferox	4		4
Grand Total		**2843**	**8**	**2851**

District 2-0:





There is no Vector Surveillance Coordinator in District 2-0; local Environmental Health Specialists (EHS) conducted the surveillance. Surveillance was conducted from June through November, and a total of 19 species were reported from District 2-0. No *Aedes aegypti* were reported. The primary species reported was *Culex spp,* most which are likely *Cx quinquefasciatus*. *Ochlerotatus japonicus* was reported from District 2-0; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from District 2-0, in Dawson County, for the first time; this invasive species is primarily found below the Fall Line.

District 2-0		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Banks	*Ae. albopictus*	2	2	4
	Ae. vexans	1	1	2
	Anopheles spp.	2		2
	Culex spp.	4	2	6

NON-VSC DISTRICTS

	Oc. japonicus		1	1
Dawson	*Ae. albopictus*	5	6	11
	Ae. albopictus (male)		1	1
	Ae. vexans		1	1
	Aedes/Ochlerotatus spp.		1	1
	Culex spp.	1	24	25
	Cx. coronator	1		1
	Oc. japonicus	2	9	11
Forsyth	*Ae. albopictus*	39		39
	Ae. vexans	3		3
	Culex spp.		46	46
	Oc. japonicus		2	2
	Oc. triseriatus	2	3	5
Franklin	*An. punctipennis*	1		1
Habersham	*Ae. albopictus*	8	8	16
	Anopheles spp.	1	1	2
	Culex spp.	4	42	46
	Cx. restuans	4	2	6
	Oc. japonicus	8	39	47
	unknown		17	17
Hall	*Ae. albopictus*	36	41	77
	Ae. albopictus (male)		2	2
	Ae. vexans	4	2	6
	Anopheles spp.	1	2	3
	Culex spp.	6	379	385
	Oc. japonicus	2	35	37
	Oc. triseriatus		3	3
	Oc. trivittatus	1	2	3
	Or. signifera		3	3
	Tx. rutilus		1	1
	unknown	1		1
Hart	*Ae. albopictus*	6	13	19
	Ae. cinereus	1		1
	Ae. vexans	9	3	12
	Aedes/Ochlerotatus spp.	17		17
	Culex spp.	8		8
	Oc. japonicus	11	7	18

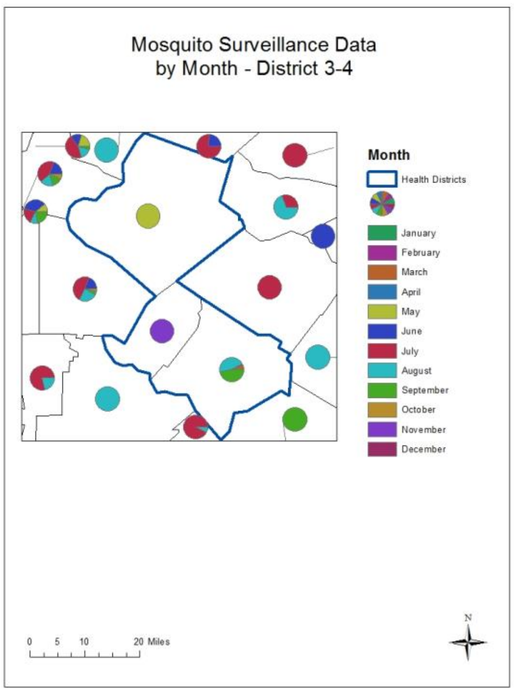
NON-VSC DISTRICTS

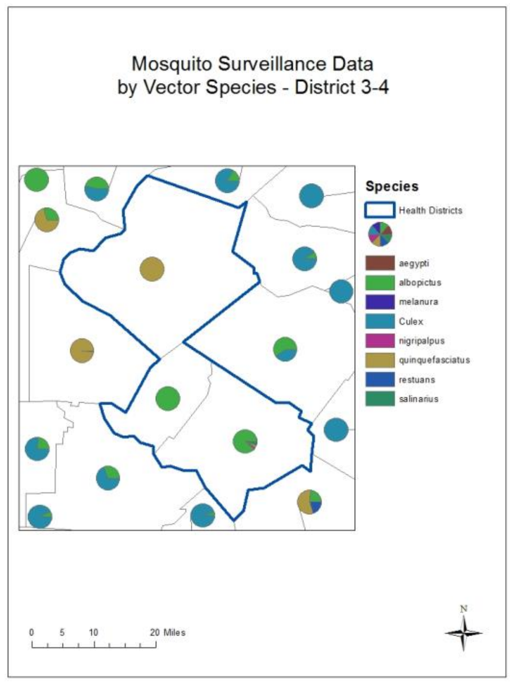
Lumpkin	*Ae. albopictus*		3	3
	Culex spp.		2	2
Rabun	*Ae. albopictus*		1	1
	Aedes/Ochlerotatus spp.	4	3	7
	Culex spp.		5	5
	Cx. erraticus	1		1
	Oc. japonicus	6	9	15
	Oc. taeniorhynchus	2		2
	Oc. thibaulti	1	1	2
	Oc. trivittatus	1	3	4
Stephens	*Ae. albopictus*	2		2
	Aedes/Ochlerotatus spp.	6	1	7
	Cq. perturbans	1		1
	Culex spp.	1	28	29
	Cx. erraticus	4	10	14
	Cx. quinquefasciatus		2	2
	Oc. japonicus	3	3	6
	Ps. columbiae		2	2
	unknown	1		1
Towns	*Ae. albopictus*	2		2
	Culex spp.		24	24
	Oc. japonicus		4	4
Union	*Aedes/Ochlerotatus spp.*		7	7
	An. punctipennis		1	1
	An. quadrimaculatus		1	1
	Anopheles spp.	4		4
	Culex spp.	18	7	25
	Culex spp. (male)		7	7
	Cx. quinquefasciatus	3	18	21
	Cx. quinquefasciatus (male)	1		1
	Oc. japonicus		8	8
	Ps. cyanescens	3		3
White	*Ae. albopictus*	1		1
	Cx. restuans		1	1
Grand Total		**256**	**852**	1108

NON-VSC DISTRICTS

District 3-4:

There is no Vector Surveillance Coordinator in District 3-4; the State Entomologists, Dr. Thuy-vi Thi Nguyen and Dr. Rosmarie Kelly conducted the surveillance. Surveillance was conducted from March through May and in August, September, and November, and a total of 15 species were reported from District 3-4. No *Aedes aegypti* were reported. The primary species reported were *Cx quinquefasciatus* and *Ae albopictus*. *Ochlerotatus japonicus* was reported from Newton County; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from Newton County for the first time; this invasive species is primarily found below the Fall Line.





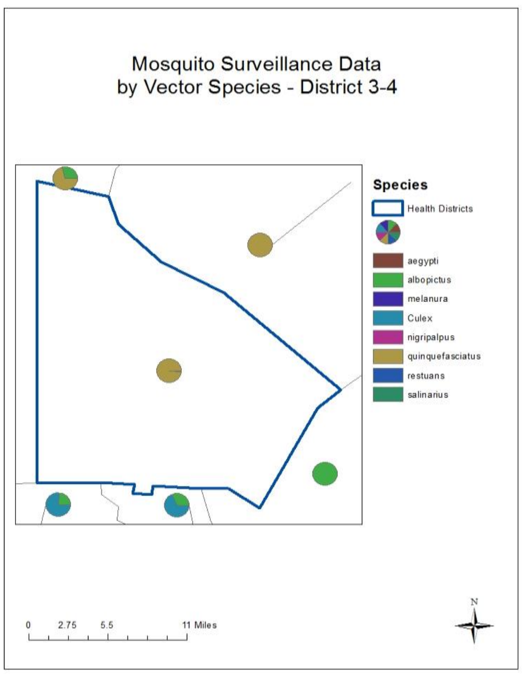
NON-VSC DISTRICTS

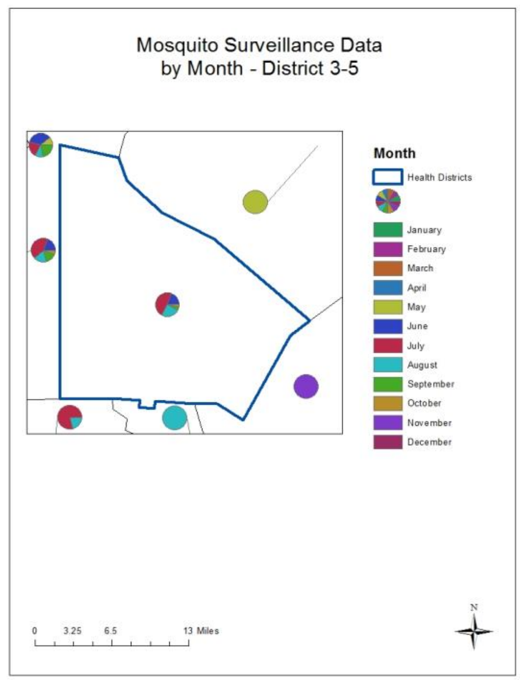
District 3-4		Trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Gwinnett	*Cx. quinquefasciatus*		20	20
Newton	*Ae. albopictus*	24	7	31
	Ae. vexans	4		4
	An. crucians	2		2
	An. quadrimaculatus	1		1
	Cq. perturbans	5		5
	Cx. coronator	7		7
	Cx. erraticus	22		22
	Cx. nigripalpus	1		1
	Cx. quinquefasciatus		1	1
	Cx. salinarius	2		2
	Oc. japonicus	2		2
	Oc. sticticus	2		2
	Oc. triseriatus	1		1
	Ps. columbiae	1		1
	Ps. ferox	1		1
Rockdale	*Ae. albopictus*		1	1
Grand Total		**75**	**29**	104

NON-VSC DISTRICTS

District 3-5:

There is no Vector Surveillance Coordinator in District 3-5; surveillance and larval control are conducted in-house by EH interns overseen by the local public health Environmental Health office. Surveillance was conducted from June through October, and a total of 5 species were reported from District 3-5. No *Aedes aegypti* were reported. The primary species reported was *Cx quinquefasciatus*. However, DeKalb County surveillance is designed to detect WNV vectors, so the data are somewhat skewed. In addition, only data sent for testing are reported to the State office. *Ochlerotatus japonicus* was reported from DeKalb County; this invasive species is primarily found above the Fall Line.





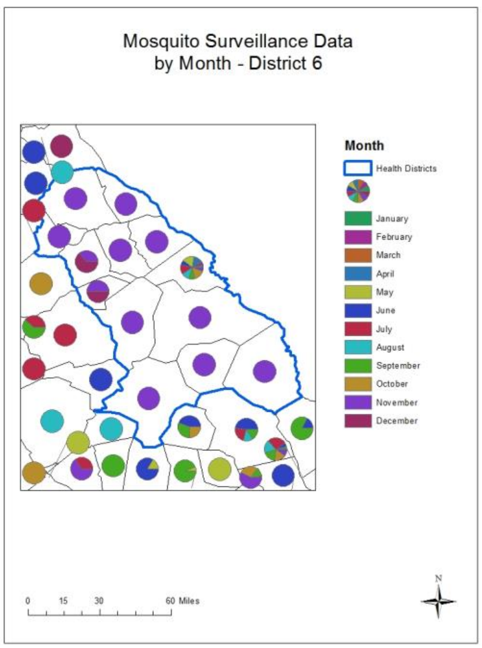
District 3-5

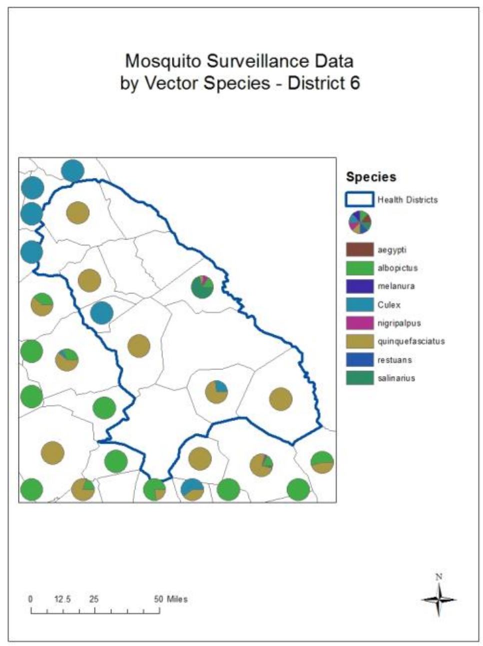
Species	**Gravid traps**
Ae. albopictus	44
Cx. quinquefasciatus	13436
Cx. restuans	211
Oc. japonicus	22
Oc. triseriatus	6
Grand Total	**13719**

NON-VSC DISTRICTS

District 6-0:

There is no Vector Surveillance Coordinator in District 6-0; Integrated Mosquito Management (IMM) is conducted in Richmond County by the mosquito control program, a stand-alone program within the local Public Health Department with close ties to Environmental Health. Surveillance in the rest of the District 6-0 counties was conducted by several VSCs along with the Richmond County mosquito surveillance technician. Surveillance was done from January through December, and a total of 26 species were reported from District 6-0. No *Aedes aegypti* were reported. The primary species reported was *Cx salinarius*. *Ochlerotatus japonicus* was reported from Richmond County; this invasive species is primarily found above the Fall Line. *Culex coronator* was also reported from Richmond County; this invasive species is primarily found below the Fall Line.





NON-VSC DISTRICTS

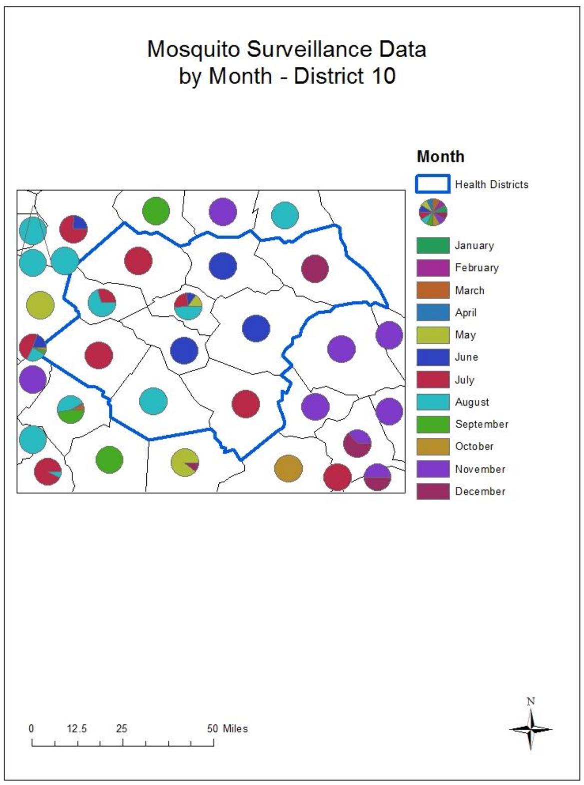
	District 6	trap types		
County	**Species**	**CDC**	**Gravid**	**Grand Total**
Burke	*An. punctipennis (male)*	2		2
Columbia	*Ps. columbiae*	2		2
Emanuel	*An. punctipennis (male)*	2		2
Glascock	*Ae. cinereus*	2		2
	Ae. vexans	2		2
	An. crucians	1		1
	Culex spp.	1		1
Jefferson	*Culex spp. (male)*		2	2
	Cx. quinquefasciatus	1		1
Jenkins	*An. crucians*		1	1
	Culex spp.	5		5
	Cx. quinquefasciatus	14		14
Lincoln	*Oc. triseriatus*	2		2
McDuffie	*An. punctipennis (male)*	2		2
Richmond	*Ae. albopictus*	643	783	1426
	Ae. vexans	1278	535	1813
	An. crucians	562	189	751
	An. punctipennis	244	133	377
	An. quadrimaculatus	32	8	40
	Cq. perturbans	1		1
	Culex spp.	4	20	24
	Cx. coronator	36	3	39
	Cx. erraticus	214	32	246
	Cx. nigripalpus	272	385	657
	Cx. quinquefasciatus	195	192	387
	Cx. restuans	47	23	70
	Cx. salinarius	2499	3842	6341
	Ma. titillans	126	27	153
	Oc. japonicus	4	7	11
	Oc. mitchellae	5		5
	Oc. sollicitans	1		1
	Or. signifera	1	2	3
	Ps. columbiae	1		1

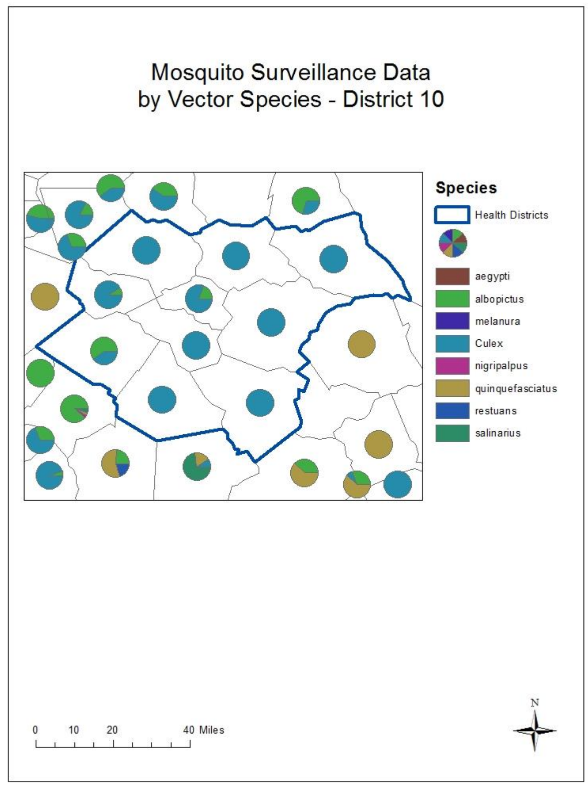
	Ps. cyanescens	2		2
	Ps. ferox	68	30	98
	Ps. howardii	1		1
	Tx. rutilus		2	2
	Ur. lowii	1		1
	Ur. sapphirina	20	3	23
Screven	*An. punctipennis (male)*	6		6
	Cx. quinquefasciatus	2		2
Taliaferro	*An. punctipennis (male)*	4		4
Warren	*Ae. vexans*	4		4
	An. crucians	5		5
	Cx. quinquefasciatus	1		1
	Ur. sapphirina	1		1
Wilkes	*Cx. quinquefasciatus*	4		4
Grand Total		**6320**	**6219**	**12539**

NON-VSC DISTRICTS

District 10-0:

There is no Vector Surveillance Coordinator in District 10; the District Environmental Health Director conducted most of the surveillance with assistance from local environmental health staff. Surveillance was conducted from May through August, and a total of 4 species were reported from District 10-0. No *Aedes aegypti* were reported. The primary species reported was unidentified *Culex spp,* although most are probably *Cx quinquefasciatus* as they were caught in gravid traps.





NON-VSC DISTRICTS

District 10		Trap types			
County	**Species**	**BGS**	**CDC**	**Gravid**	**Grand Total**
Barrow	*Ae. albopictus*		2	2	4
	Ae. vexans		3	5	8
	Culex spp.		4	37	41
	unknown		18	18	36
Clarke	*Ae. albopictus*	34		13	47
	Ae. vexans			23	23
	Culex spp.			193	193
	unknown	11		102	113
Elbert	*Ae. vexans*		1		1
	An. crucians		1		1
	Culex spp.			1	1
Greene	*Ae. vexans*			3	3
	Culex spp.			17	17
	unknown			9	9
Jackson	*Culex spp.*			63	63
	unknown			26	26
Madison	*Ae. vexans*			6	6
	Culex spp.			10	10
	unknown			11	11
Morgan	*Culex spp.*			25	25
	unknown			10	10
Oconee	*Ae. vexans*			3	3
	Culex spp.			23	23
	unknown			5	5
Oglethorpe	*Ae. vexans*			11	11
	Culex spp.			4	4
	unknown			21	21
Walton	*Ae. albopictus*		3		3
	Culex spp.		2		2
	unknown		1		1
Grand Total		**45**	**35**	**641**	721

Larval Surveillance

Source reduction is the single most effective means of vector control. It is especially effective against container-breeding mosquitoes. Environmental control and source reduction begin with a detailed larval survey, including key container types that serve as sources for mosquitoes. Larval source management (LSM) involves the removal, modification or treatment, and monitoring of aquatic habitats to reduce mosquito propagation and human-vector contact. Interventions for LSM range from simple—draining aquatic sites or treating them with larvicidal chemicals and removing water-holding containers capable of producing mosquitoes—to complex, such as implementing Rotational Impoundment Management or Open Marsh Water Management techniques.

Larvicides are classed as stomach toxins, contact larvicides, surface agents, natural agents and insect growth regulators (IGR). Recently another method of larval control has become available. The LarvaSonic is an acoustic larvicide system. Sound energy transmitted into water at the resonant frequency of the mosquito larvae air bladders instantly ruptures the internal tissue and causes death.

Larval surveillance was conducted in the following counties:

District	County	Species	# larvae
1-2	Cherokee	*Ae. albopictus*	20
		Oc. japonicus	12
	Fannin	*Ae. albopictus*	47
		Cx. restuans	12
		Oc. japonicus	127
	Gilmer	*Ae. albopictus*	3
		An. quadrimaculatus	2
		Cx. territans	1
		Oc. japonicus	20
	Murray	*An. punctipennis*	1
		Cx. quinquefasciatus	448
		Cx. restuans	1
		Oc. trivittatus	111
		Ps. ferox	1
	Pickens	*Ae. albopictus*	41
		An. punctipennis	1
		Cx. restuans	2
		Oc. japonicus	26

		Ps. cyanescens	3
	Whitfield	*Ae. albopictus*	47
		Ae. vexans	1
		Cx. erraticus	20
		Cx. restuans	233
		Oc. japonicus	70
2-0	**Banks**	*Cx. quinquefasciatus*	3
		Cx. restuans	2
		Oc. japonicus	2
		unknown	3
	Dawson	*Oc. atropalpus*	1
		Oc. japonicus	4
		unknown	2
	Forsyth	*Oc. atropalpus*	1
		Oc. japonicus	2
	Franklin	*Ae. albopictus*	10
		Ae. japonicus	3
		Cx. restuans	6
	Habersham	*Ae. albopictus*	4
		Ae. japonicus	7
		Cx. erraticus	8
		Oc. atropalpus	4
		unknown	5
	Hall	*Ae. albopictus*	6
		Ae. albopictus (male)	1
		Oc. atropalpus	2
		Oc. japonicus	4
		unknown	5
	Lumpkin	*Ae. albopictus*	1
		Culex spp.	1
		Oc. japonicus	2
	Rabun	*Ae. albopictus*	8
		Oc. japonicus	3
	Towns	*Oc. japonicus*	6
		unknown	4
	White	*Ae. albopictus*	1
		Cs. inornata	1

		Cx. restuans	1
		Oc. atropalpus	1
		Oc. japonicus	6
		Oc. triseriatus	1
9-1	**Effingham**	*Ae. albopictus*	10
		Tx. rutilus	1
Grand Total			**1382**

Integrated Mosquito Management

What does mosquito control do to protect the public health? In Georgia, there are ~60 different mosquito species. Each species of mosquito has a different flight range, host preference, larval habitat and potential for carrying and transmitting infectious disease. Any mosquito that bites or annoys people can be considered a health problem, but in Georgia the definition includes mosquitoes that carry infectious diseases like West Nile Virus (WNV), LaCrosse Encephalitis (LAC), and Eastern Equine Encephalitis (EEE), as well as those can transmit new and emerging viruses like Chikungunya and Zika.

The best way to control the mosquitoes in order to reduce the nuisance factor and protect public health is by utilizing a wide variety of control methods known as Integrated Mosquito Management (IMM). The first part of IMM is trapping and surveillance, which help to quantify the numbers, species and location of mosquitoes.

What are the techniques of Integrated Mosquito Management (IMM) program that serve to actually eliminate the mosquito? If your county has mosquito control, it is usually located in the Public Works Department, but may be in Environmental Health or could be a stand- alone agency. The first response to a mosquito complaint is to send an inspector to find the source of the mosquitoes. Source reduction, also known as physical control, is an important part of IMM. This involves finding and eliminating potential mosquito breeding areas, and is typically the most effective and economical of the various techniques used to control mosquitoes.

Mosquitoes need water for their eggs to hatch and for the larvae to survive until adulthood. In areas around a home these sources may include birdbaths, unscreened swimming pools, and old tires, anything that can retain water. This includes hollow stemmed plants like bromeliads. The inspector should educate the homeowner about keeping these items clean and dry, or rinsing them periodically with fresh water.

If the source is a new pond or other permanent- water area that cannot or should not be drained, the inspector may elect to stock it with small, non- descript mosquito-eating fish called Gambusia. Using the mosquito's natural predator to reduce populations is a method of biological control.

Another technique is called larviciding. Larviciding, as the name implies, kills mosquito larvae and pupae using a variety of products, both chemical and biological. This prevents the metamorphosis of the larvae into the flying, biting pests that we know and hate. Larvicide treatments can be applied by ground or air to standing water depending on the size of the area. Different types of larvicides include chemical pesticides that are absorbed or ingested by the larvae, surface control agents that suffocate the pupae, insect growth regulators, and microbial larvicides. Larvicides commonly used in Georgia include microbial larvicides and insect growth regulators (IGRs). The microbial larvicide consists of two species of the bacterium, Bacillus (Bti and *B sphaericus*), that are toxic when ingested by mosquito and black fly larvae. Methoprene, an IGR, prevents mosquito larvae from molting to the adult stage.

Once adult mosquitoes are on the wing, the only way to control them is to use an adulticide. Using truck-mounted sprayers or aircraft, a condensed plume of ultralow volume (ULV) insecticide is released into the air, which spreads out with the prevailing wind and when it comes into contact with flying mosquitoes, kills them.

Mosquito control may also use a barrier spray to provide the homeowner some temporary relief. This is also one method of controlling day biting mosquitoes. A barrier spray is a coating of pesticide droplets sprayed onto foliage surrounding an area that has been inundated by mosquitoes. This will kill mosquitoes landing in the foliage, and it repels them. It adheres to the underside of the foliage, depriving them of their resting places.

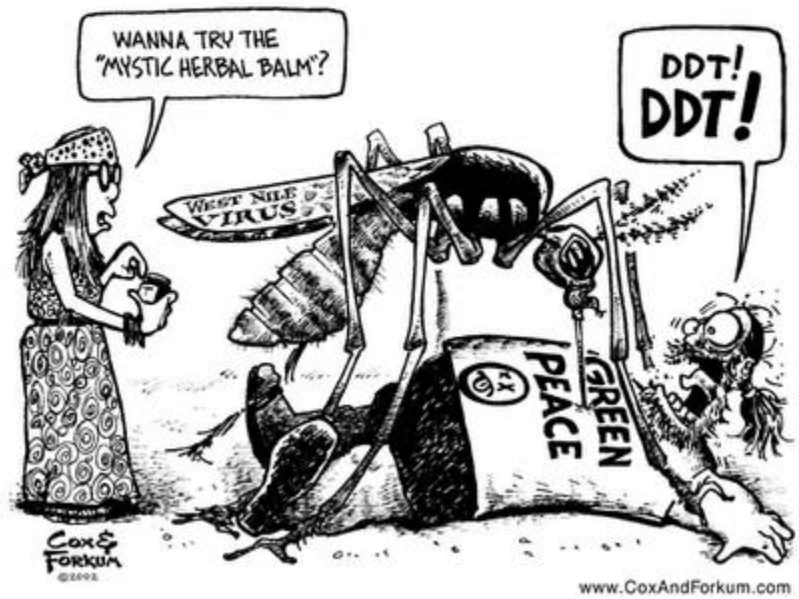
Another technique, thermal fogging, can be used to control day biting mosquitoes or to control mosquitoes in areas where vegetation is dense and ULV does not penetrate.

The amount of chemical used is designed to be target specific, in that it kills mosquitoes without harming anything else. Since most mosquitoes do not fly during the daytime, adulticiding is done at dusk and beyond, and the hours just before dawn, when mosquito activity is at its peak. Additionally, pesticide sprayed by ULV machines during the heat of the day rises and never comes into contact with the mosquitoes, and so is wasted.

It is impossible to completely eradicate the mosquito, so the focus should be on controlling mosquito populations in order to reduce the nuisance factor and protect public health by using all aspects of Integrated Mosquito Management. It is important to remind homeowners that they can also play a role in mosquito control, especially where organized mosquito control is not present. Surveillance can be used to determine if the mosquito is *Aedes albopictus*, the Asian tiger mosquito, or some other species. By standing out in the yard during the day and waiting to see if a small black and silver mosquito comes to bite your legs, it is possible to determine if this species is present. This is the most common nuisance species in Georgia and, unless there have been heavy rains recently or the area is along the coast, the mosquito most likely to come and bite during the day.

Why is this important? This species is a container breeder and does not fly very far from where it lays its eggs. Source reduction is the best means of control. Picking up anything that holds water and disposing of it correctly, refilling bird baths and animal water bowls at least once a week, raking up big leaves, and cleaning gutters will help reduce the populations of this species and other container breeders. Additionally, pools need to be maintained properly as “green” pools breed large numbers of mosquitoes, including the WNV vector. Homeowners can also buy larvicide, both Bti (mosquito dunks) and methoprene (mosquito torpedoes). This can be applied to standing water to control mosquitoes by killing larvae. As with any pesticide, it is important to follow the label instructions explicitly.

Finally, it is important to wear repellent outside when mosquitoes are biting. Information about the various types of recommended repellents can be found at http://dph.georgia.gov/mosquito-borne-viral-diseases.

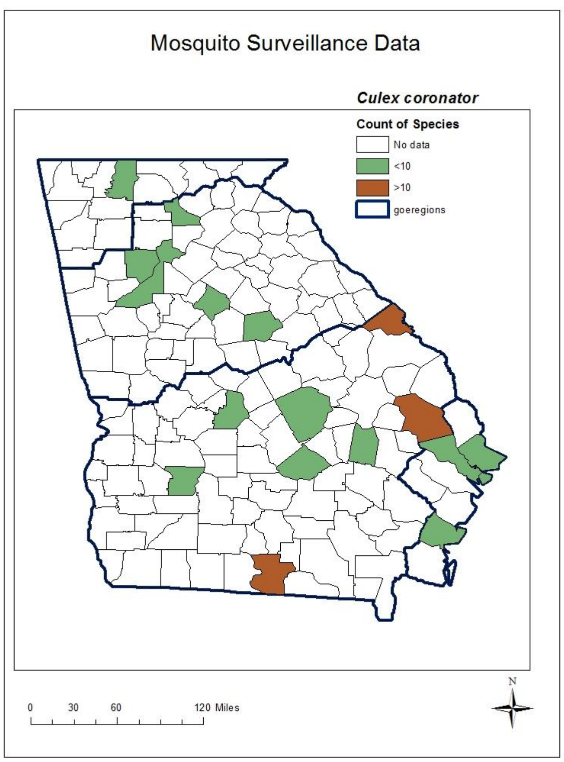


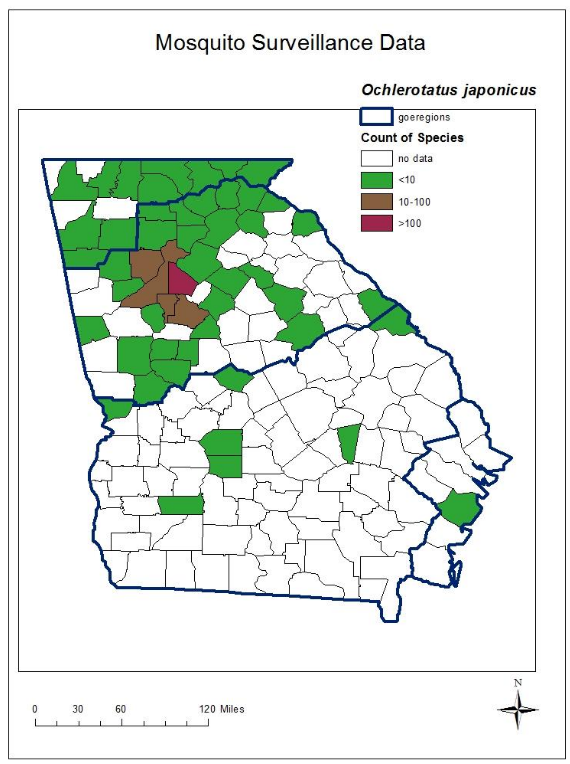
Invasive Mosquito Species

One of the benefits of mosquito surveillance is determining where mosquito species are found. This is especially important for vector species and for invasive species which may become involved in arboviral disease cycle.

Culex coronator was first detected in Georgia in 2006. It was found initially in counties below the Fall line. Mosquito surveillance done in 2017 has shown that this species can now be found in most regions of Georgia. It is important to monitor *Cx coronator* as it has the potential to be involved in the WNV cycle.

Ochlerotatus japonicus was first detected in Georgia in 2002. This species lays its eggs in rock pools, so was initially found only above the Fall line. Mosquito surveillance done in 2017 has shown that this species can now be found in most regions of Georgia. It is important to monitor *Oc japonicus* as it has the potential to be involved in the WNV cycle.





CONCLUSIONS

Conclusions

In 2017, mosquito surveillance was done in all 159 of Georgia's counties. This is compared to surveillance being conducted in 60 counties in 2016, and only 13 counties in 2015. This is the first time surveillance data have been collected in every county in Georgia, and while surveillance was limited in many counties, these data can serve as an initial baseline.

Species	BG	CDC	Exit	Gravid	Grand Total
Ae. aegypti		32			32
Ae. albopictus	1072	2701		2302	6075
Ae. albopictus (male)		70		30	100
Ae. cinereus		129			129
Ae. cinereus (male)		14			14
Ae. vexans	1	2563		727	3291
Ae. vexans (male)		4			4
Aedes/Ochlerotatus spp.	6	213		24	243
An. crucians		1031		199	1230
An. punctipennis	1	938		137	1076
An. punctipennis (male)		24			24
An. quadrimaculatus	1	61		12	74
Anopheles spp.		157		29	186
Anopheles spp. (male)		20		8	28
Cq. perturbans		1767		53	1820
Cs. inornata		9		3	12
Cs. melanura		1938	128	73	2139
Culex spp.		1475		7890	9365
Culex spp. (male)		6		30	36
Culiseta spp.		12			12
Cx. coronator		474		65	539
Cx. coronator (male)		3			3
Cx. erraticus	14	2006	29	152	2201
Cx. erraticus (male)		10			10
Cx. nigripalpus		19019		7580	26599
Cx. quinquefasciatus	312	4308		80730	85350
Cx. quinquefasciatus (male)		1		6	7

Cx. restuans	7	81		372	460
Cx. salinarius	7	3728		4219	7954
Cx. territans		47		22	69
Cx. territans (male)		1			1
Ma. dyari		3			3
Ma. titillans		217		27	244
Oc. atlanticus	1	297			298
Oc. canadensis		1			1
Oc. fulvus pallens		39			39
Oc. infirmatus		74			74
Oc. japonicus	1	202		173	376
Oc. mitchellae		8			8
Oc. sollicitans		30			30
Oc. sticticus		36			36
Oc. taeniorhynchus		488			488
Oc. thibaulti		1		1	2
Oc. triseriatus	11	28		35	74
Oc. trivittatus		492		5	497
Oc. trivittatus (male)		2			2
Or. signifera	1	100		16	117
Ps. ciliata	1	45			46
Ps. columbiae	1	217		7	225
Ps. cyanescens		99			99
Ps. cyanescens (male)		1			1
Ps. discolor		5			5
Ps. ferox	4	282		40	326
Ps. howardii		6			6
Ps. howardii (male)		3			3
Ps. mathesoni		9			9
Psorophora spp.		9			9
Tx. rutilus	11	1		9	21
unknown	12	161		253	426
Ur. lowii		2			2
Ur. sapphirina		40		3	43
Grand Total	1464	45740	157	105232	152593

CONCLUSIONS

Year	# counties doing surveillance	% of counties
2001	2	1.3%
2002	11	6.9%
2003	26	16.4%
2004	56	35.2%
2005	55	34.6%
2006	28	17.6%
2007	28	17.6%
2008	28	17.6%
2009	26	16.4%
2010	22	13.8%
2011	19	11.9%
2012	12	7.5%
2013	13	8.2%
2014	15	9.4%
2015	13	8.2%
2016	60	37.7%
2017	159	100.0%

This level of surveillance was only possible through the combined effort of State, District, and County Environmental Health, as well as assistance from several other agencies.

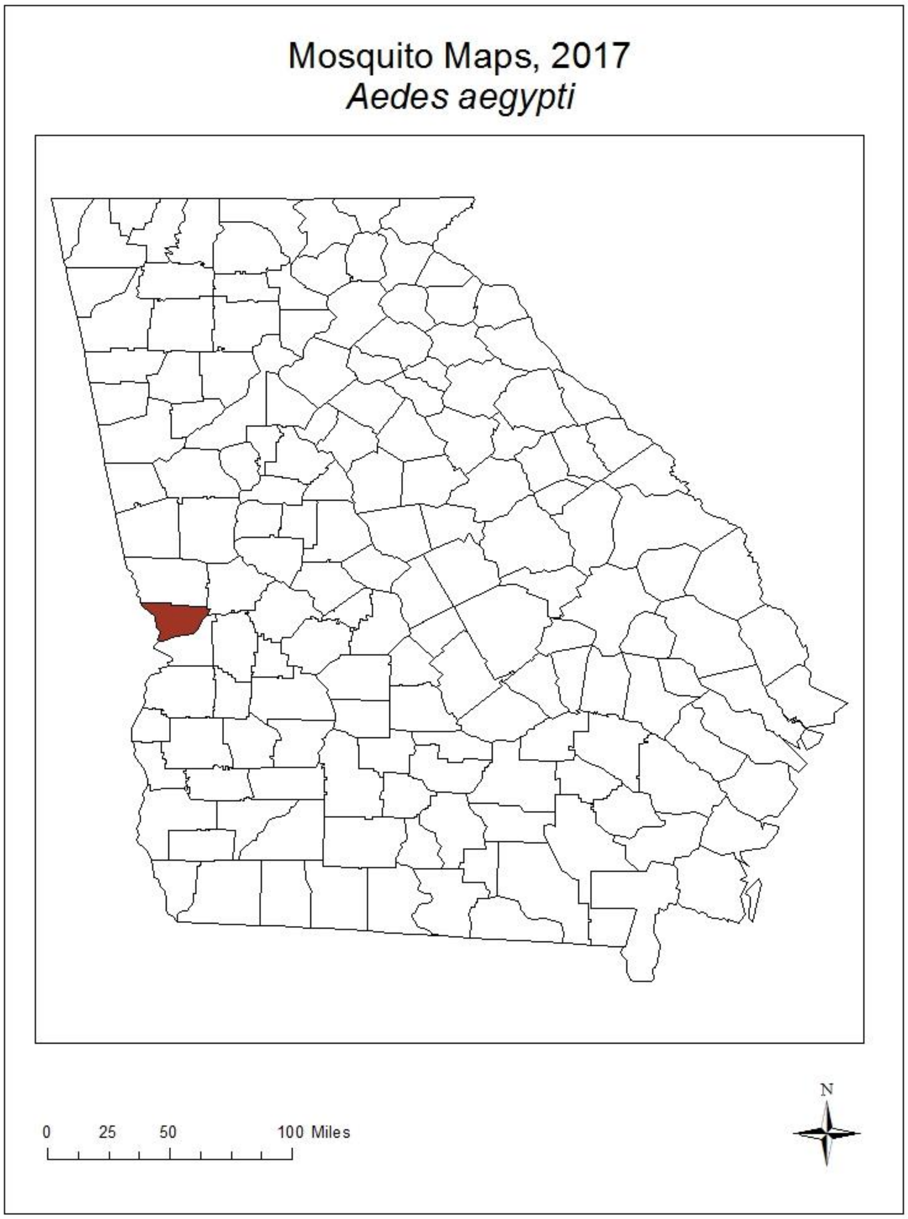
Our goals for 2017 were:

- Do some level of mosquito surveillance in every county in Georgia
- Provide mosquito surveillance equipment and train interested people in every Health District to do mosquito surveillance, ID, and control
  - With the support of Medical and EH Directors
  - With the understanding that other tasks take precedence
- Be better prepared for the next mosquito-borne virus to come along
- Have the equipment and training available to support local outreach for mosquito complaints

I believe we have accomplished these goals, with the help and support of a great many people.

MAPS

Maps



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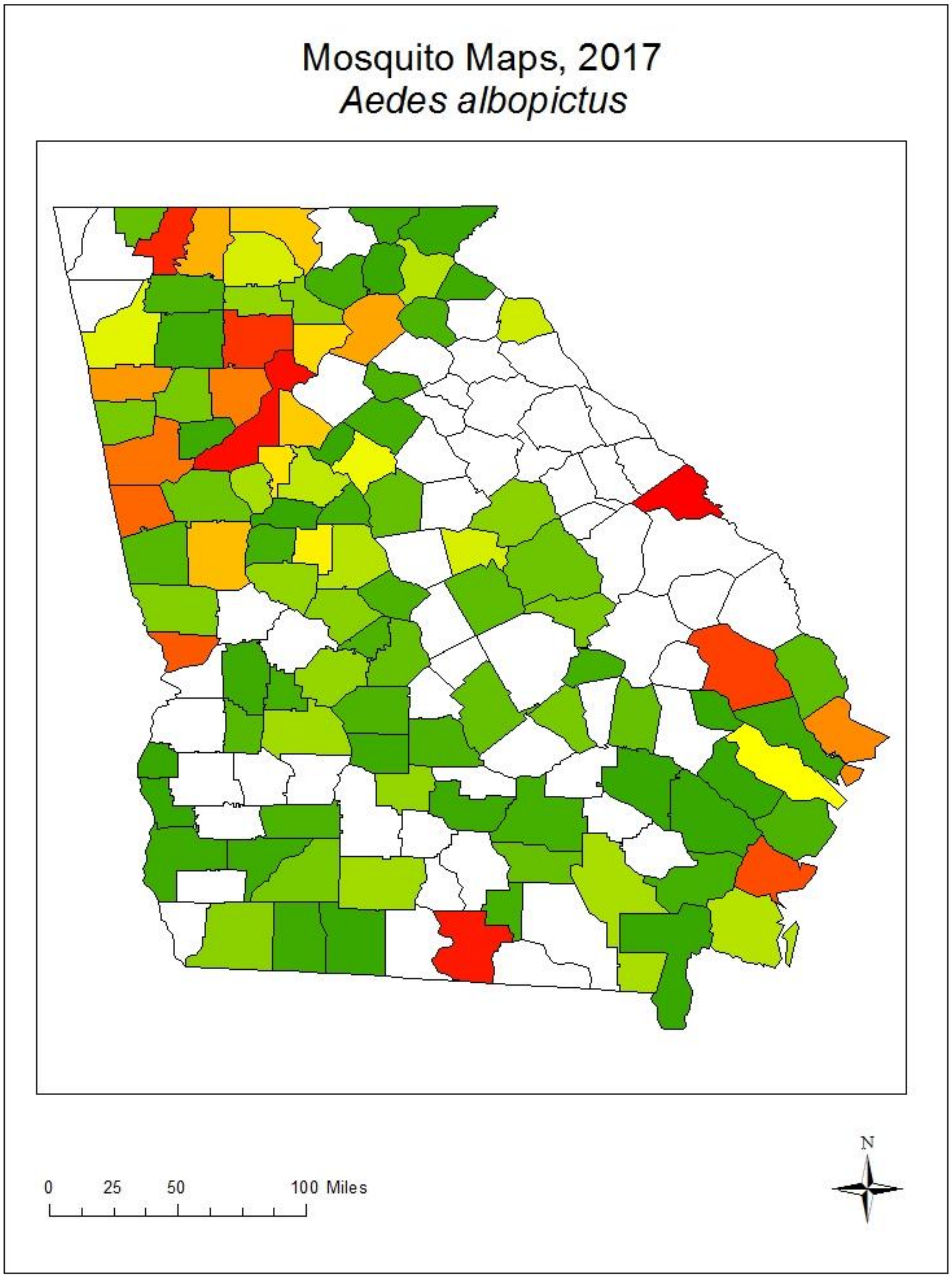

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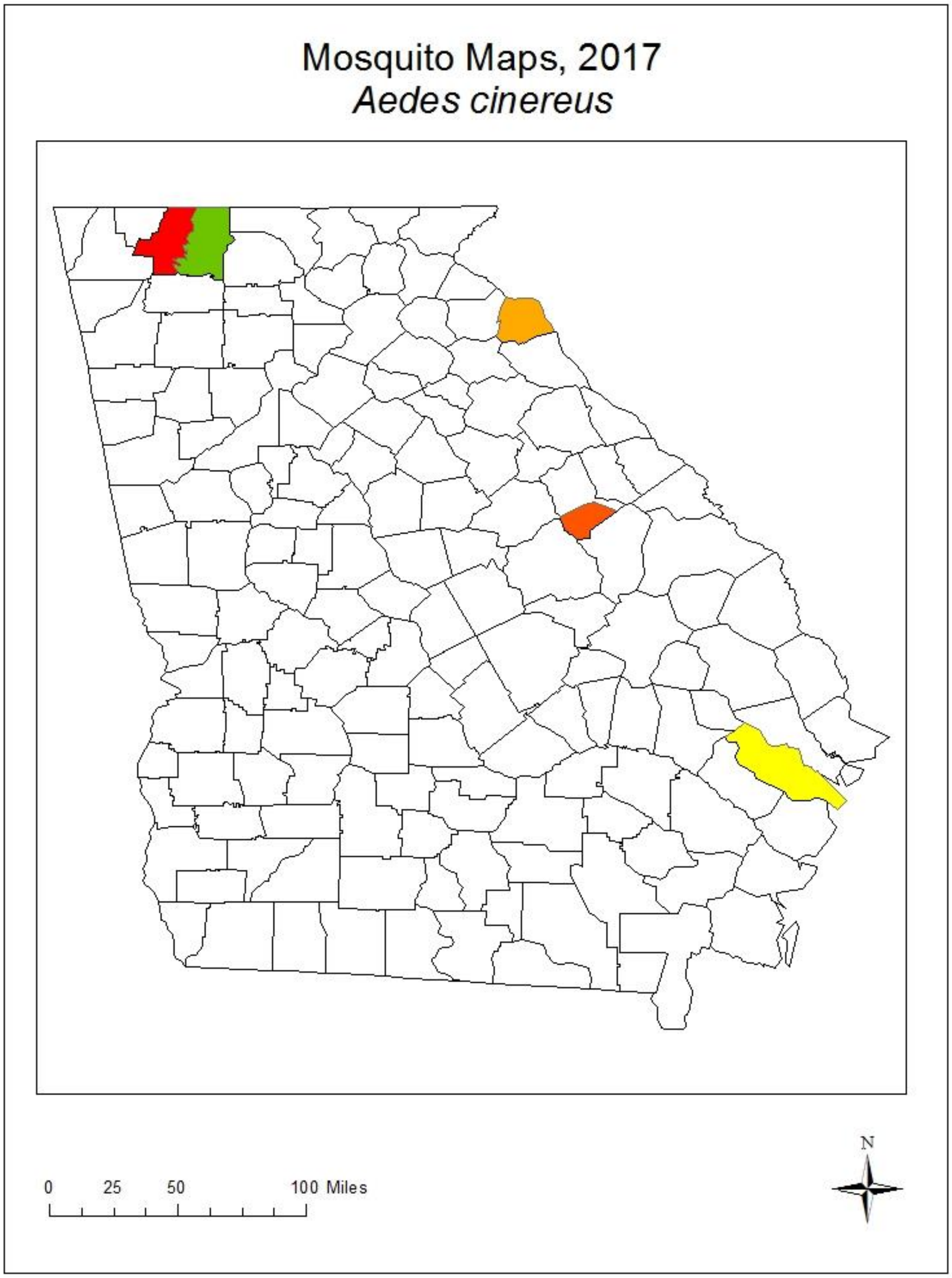

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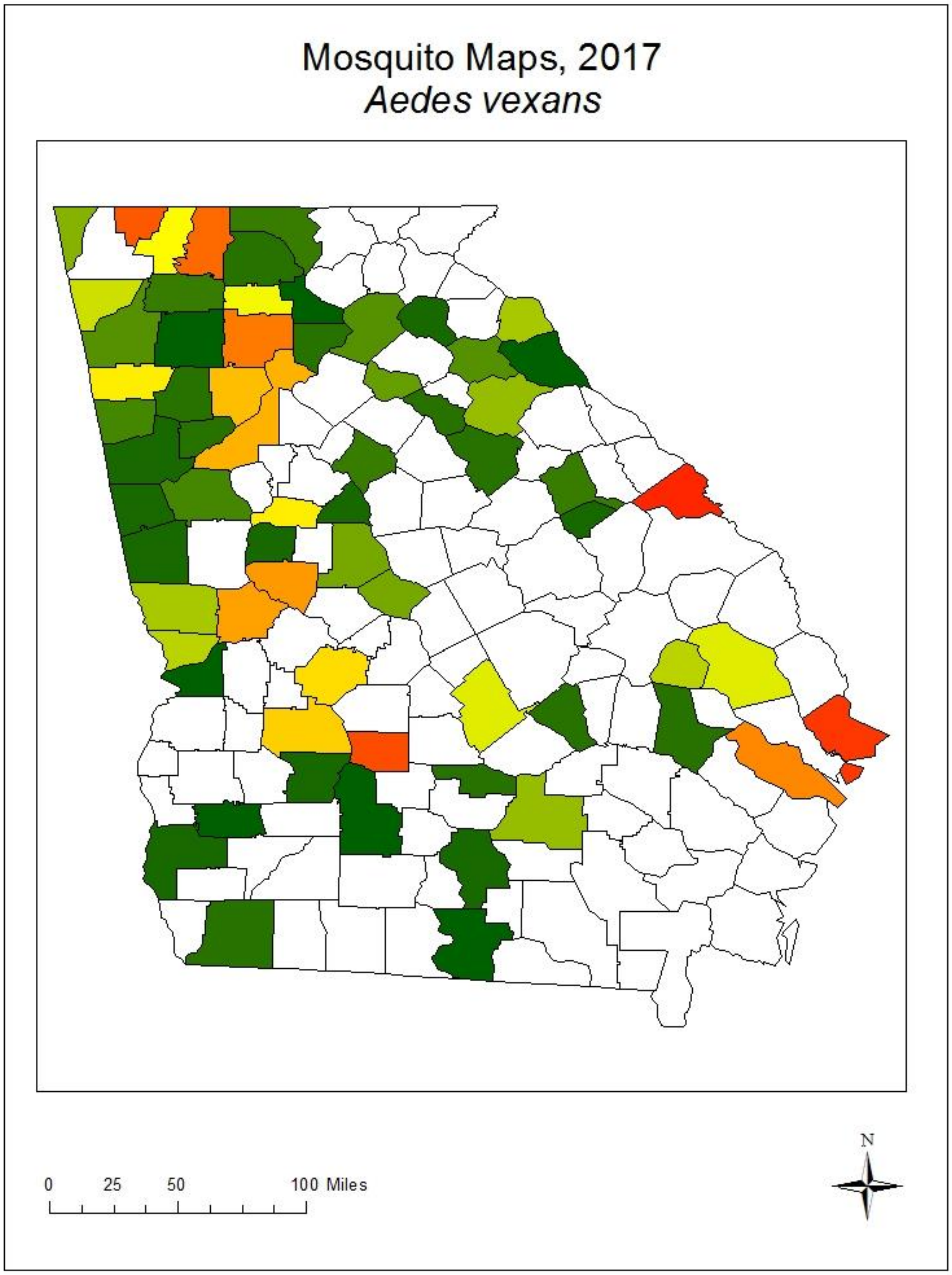

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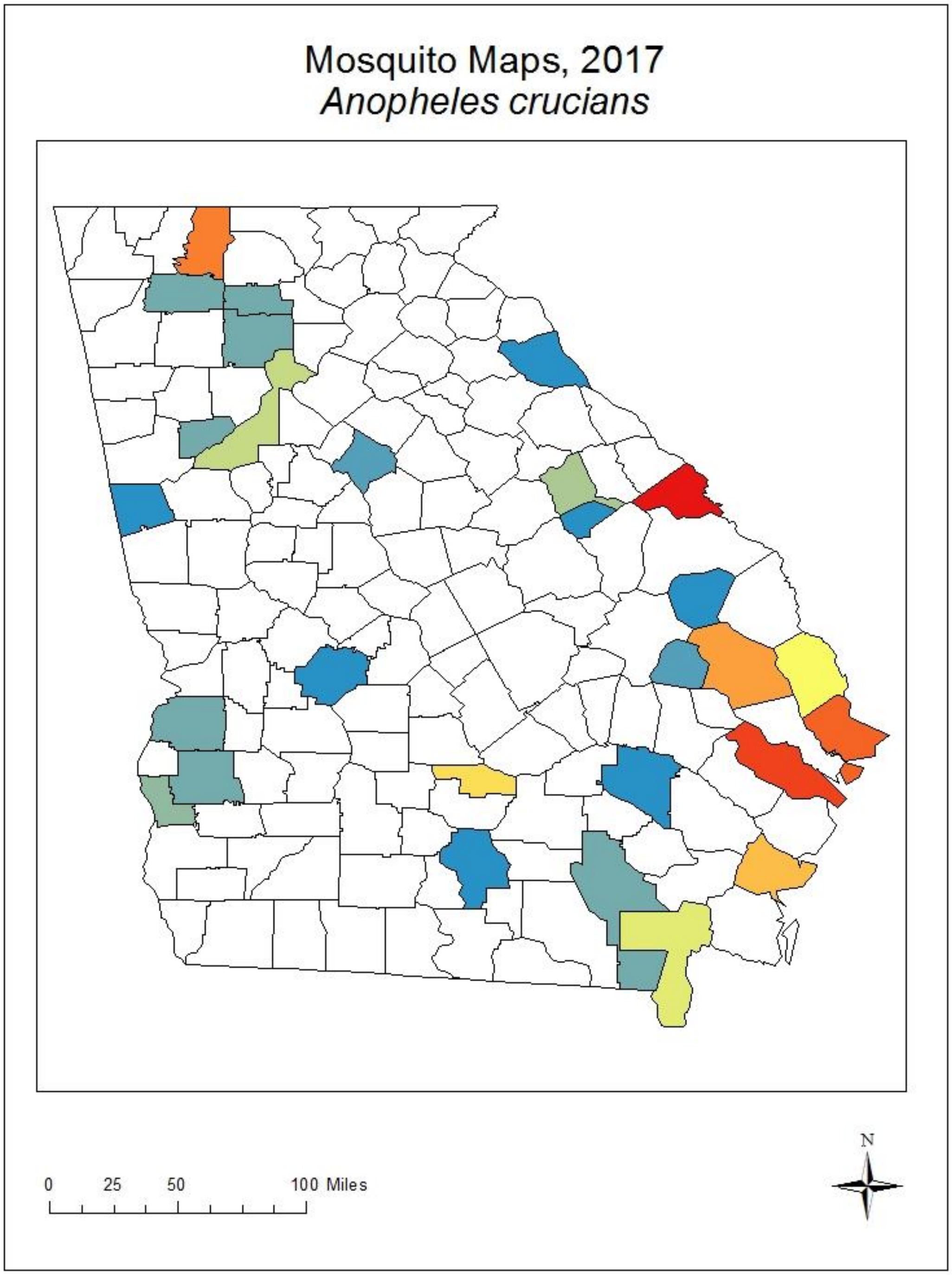

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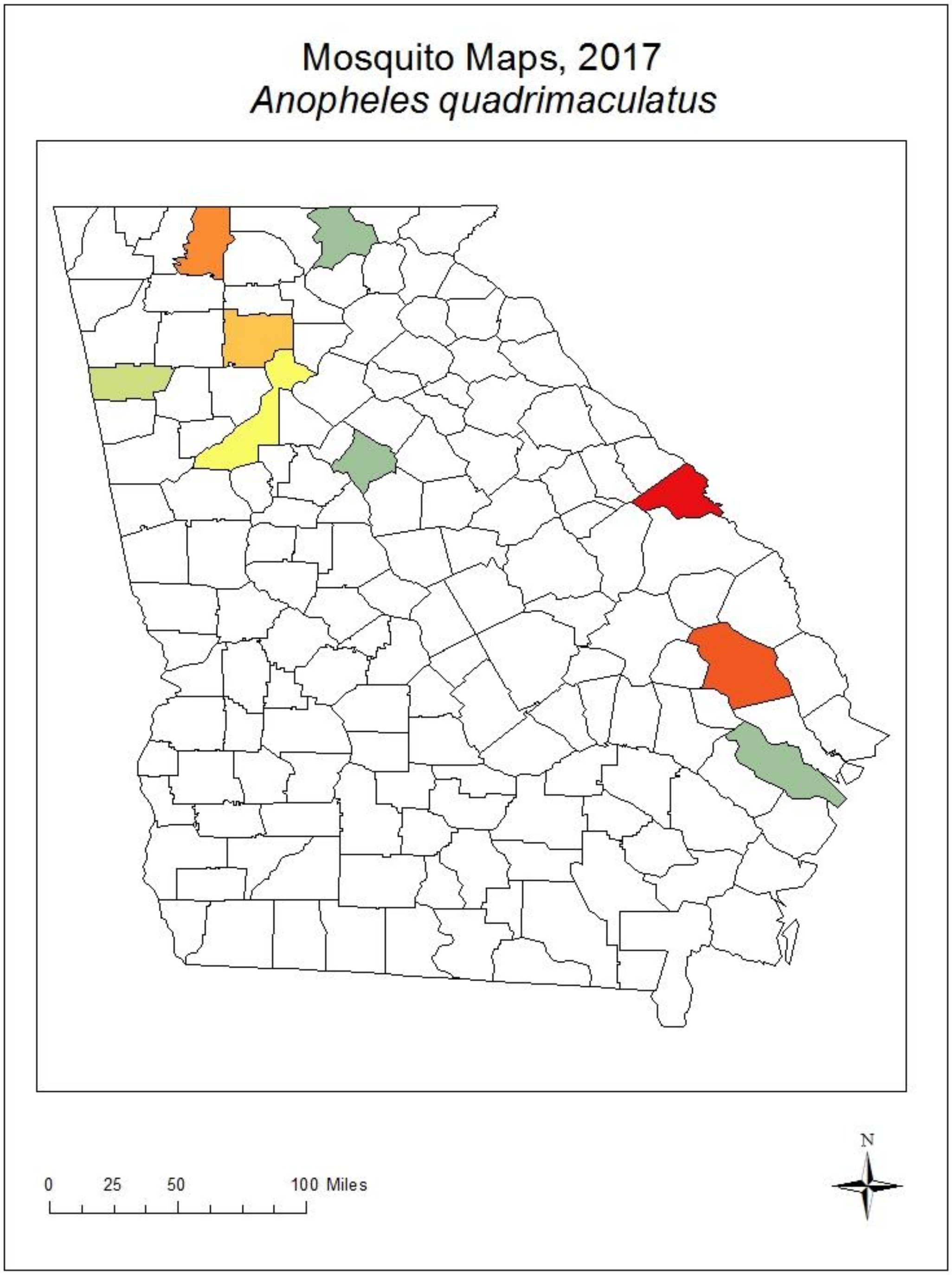
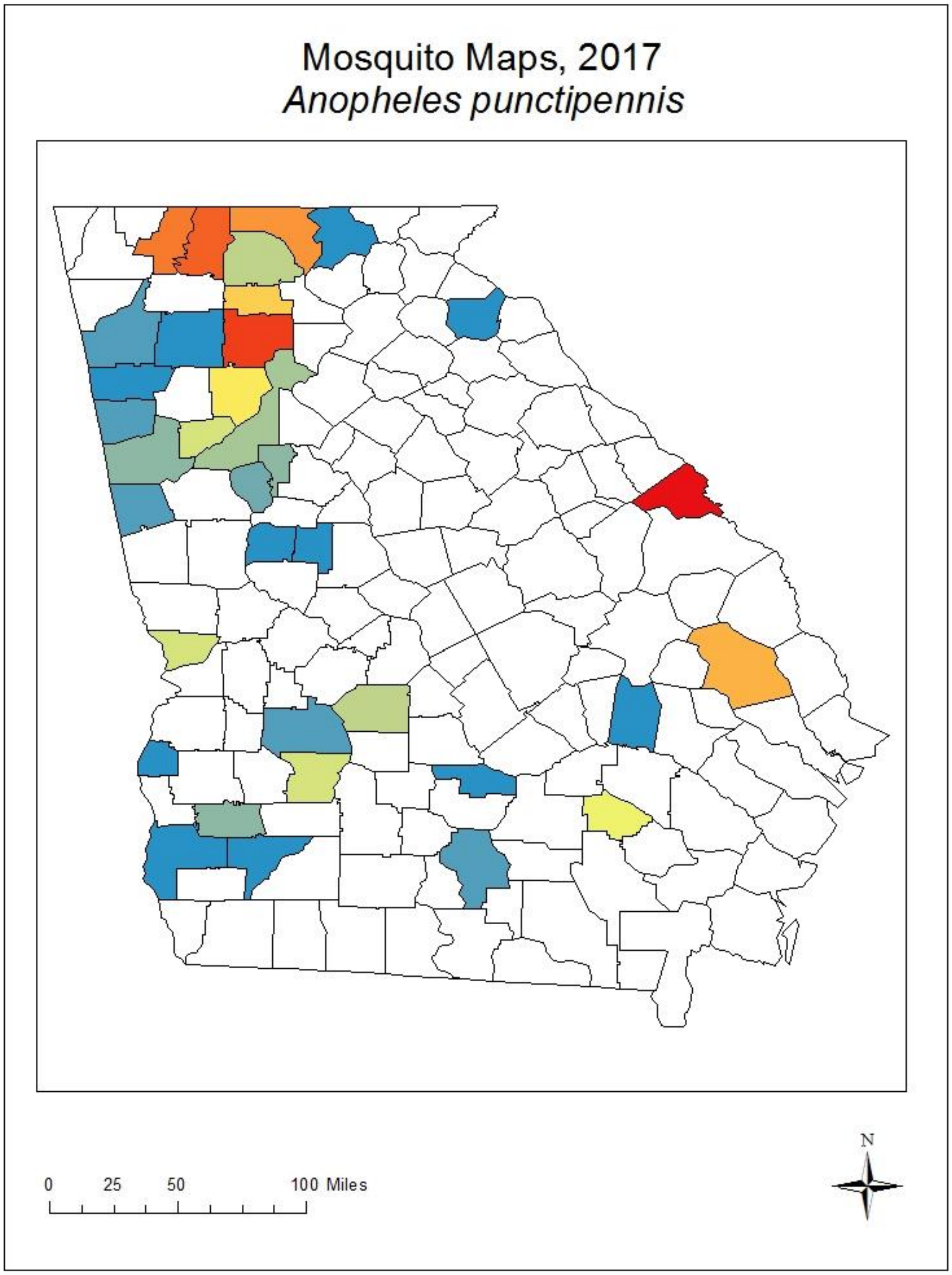
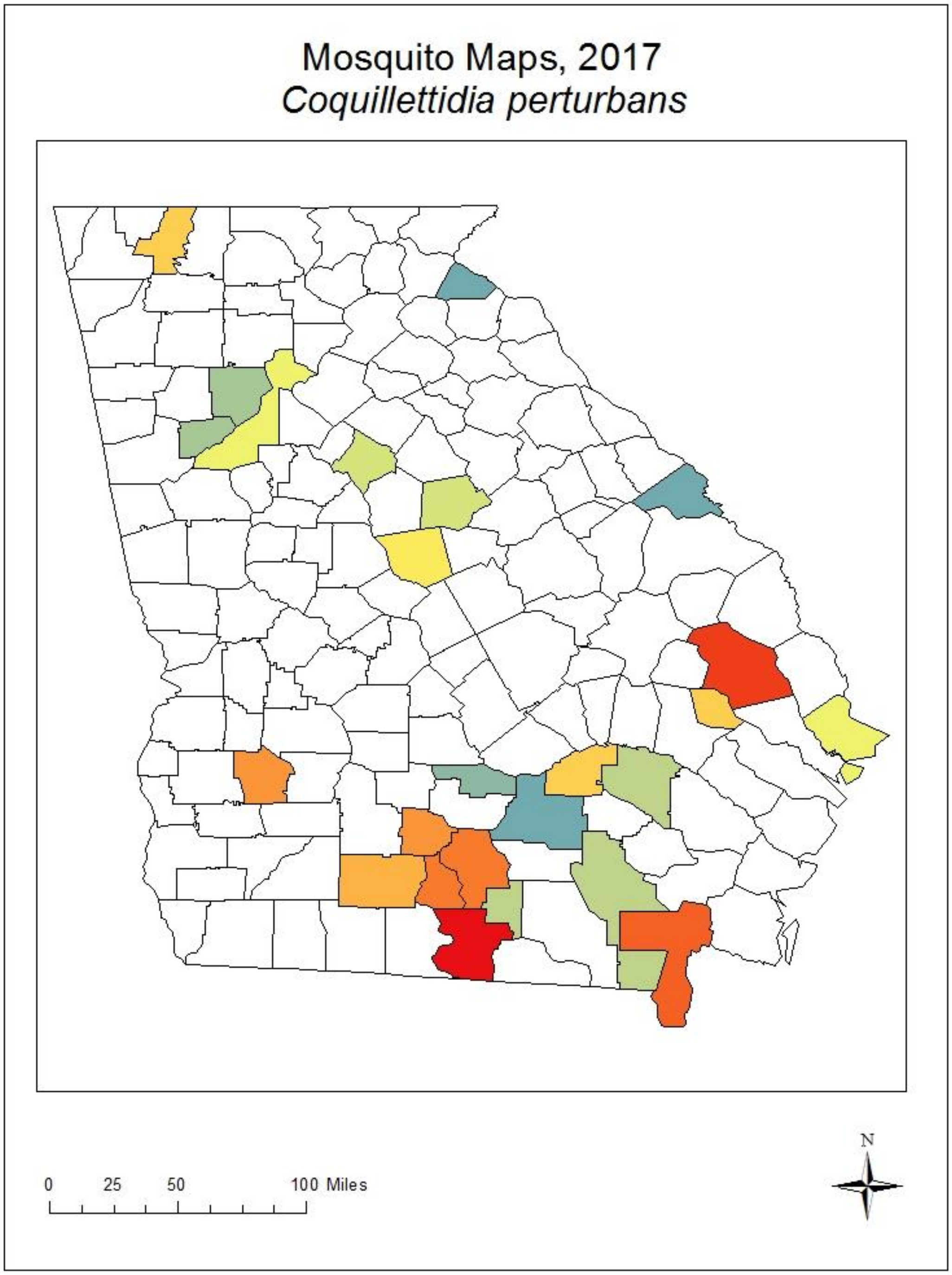

Mosquito Maps, 2017
Anopheles quadrimaculatus
0 25 50 100 Miles
N

MAPS



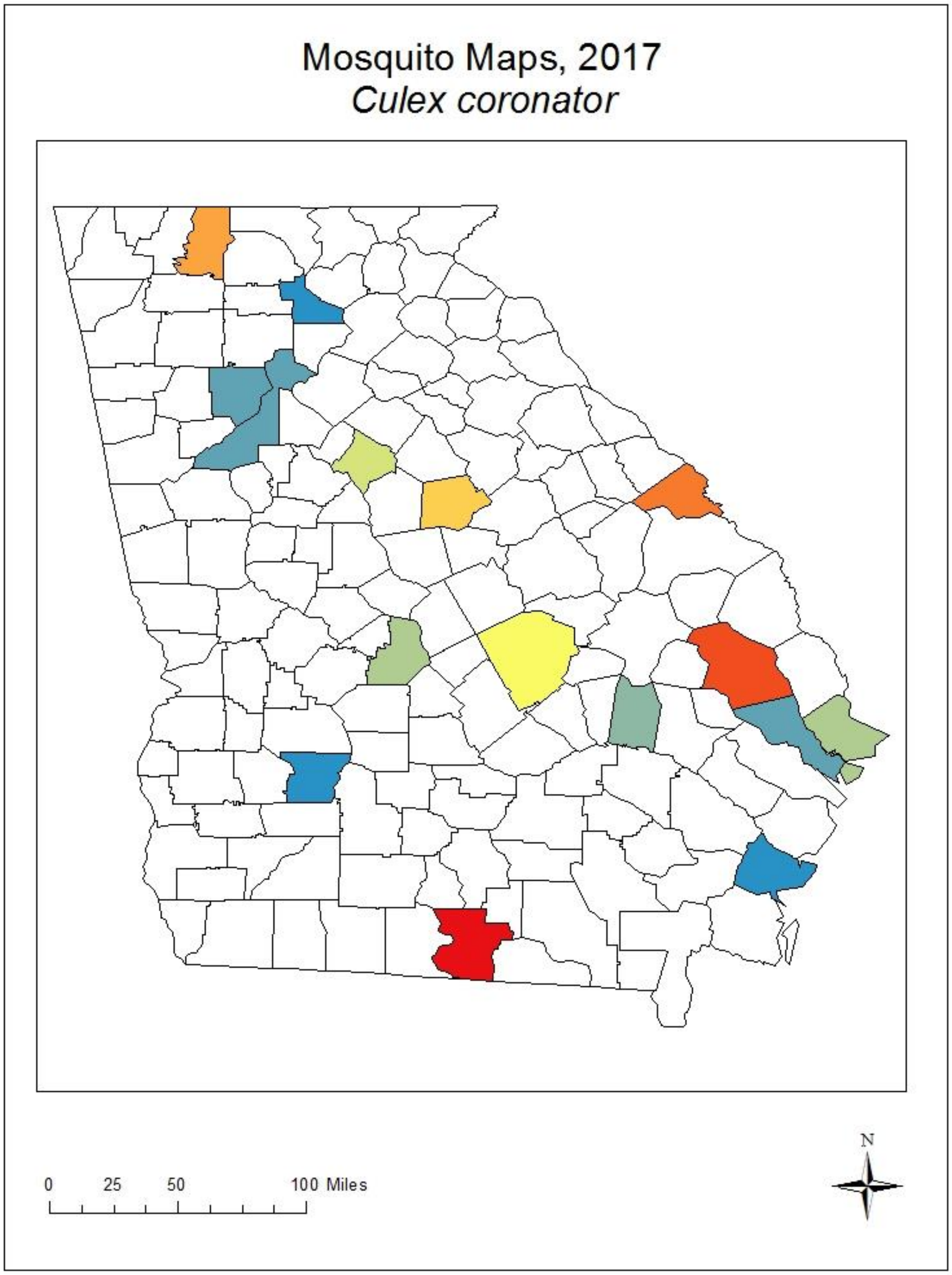
Mosquito Maps, 2017
Anopheles punctipennis
0 25 50 100 Miles
N

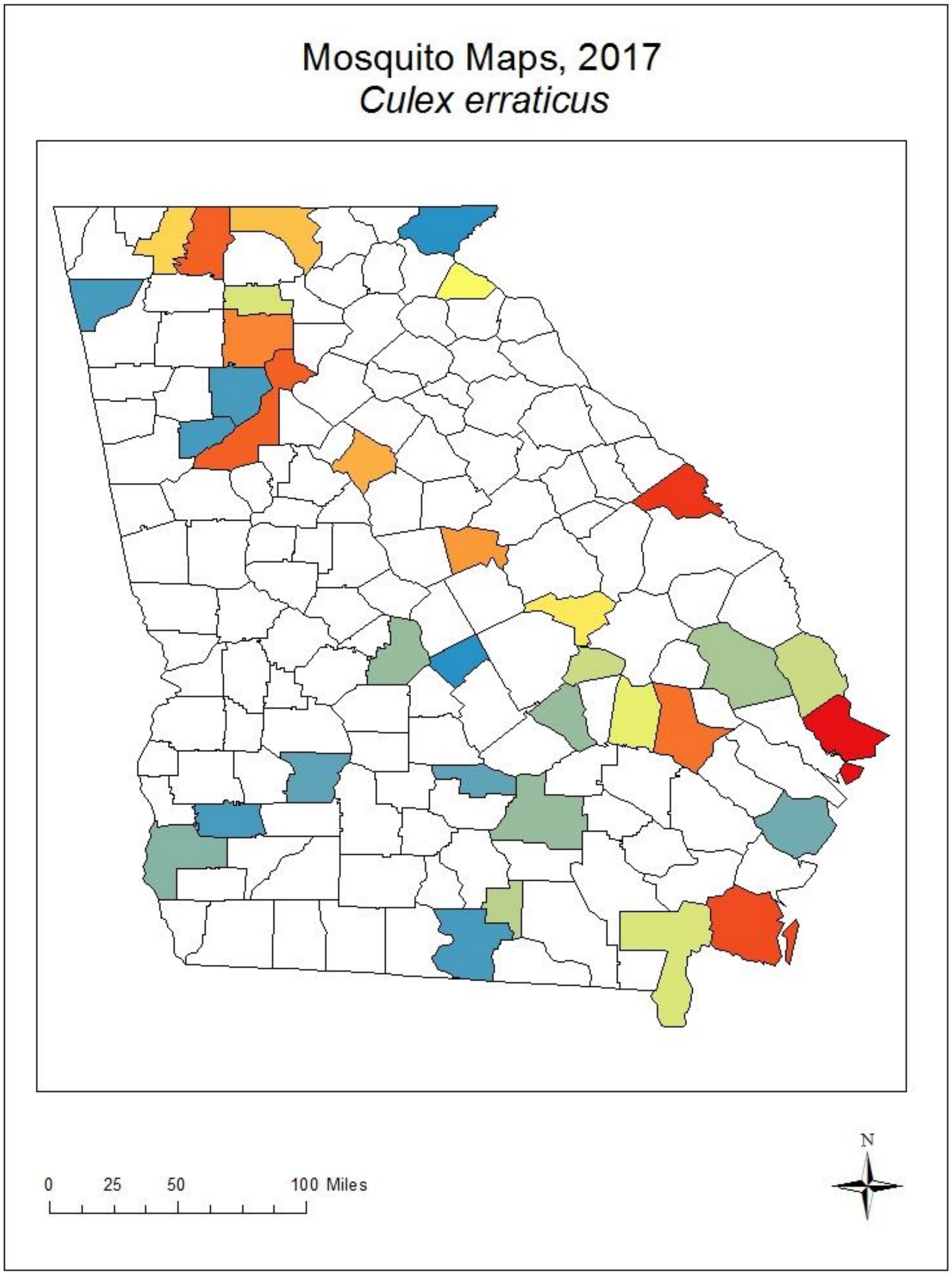
MAPS



Mosquito Maps, 2017
Coquillettidia perturbans
0 25 50 100 Miles
N

MAPS




Mosquito Maps, 2017
Culex erraticus
0 25 50 100 Miles
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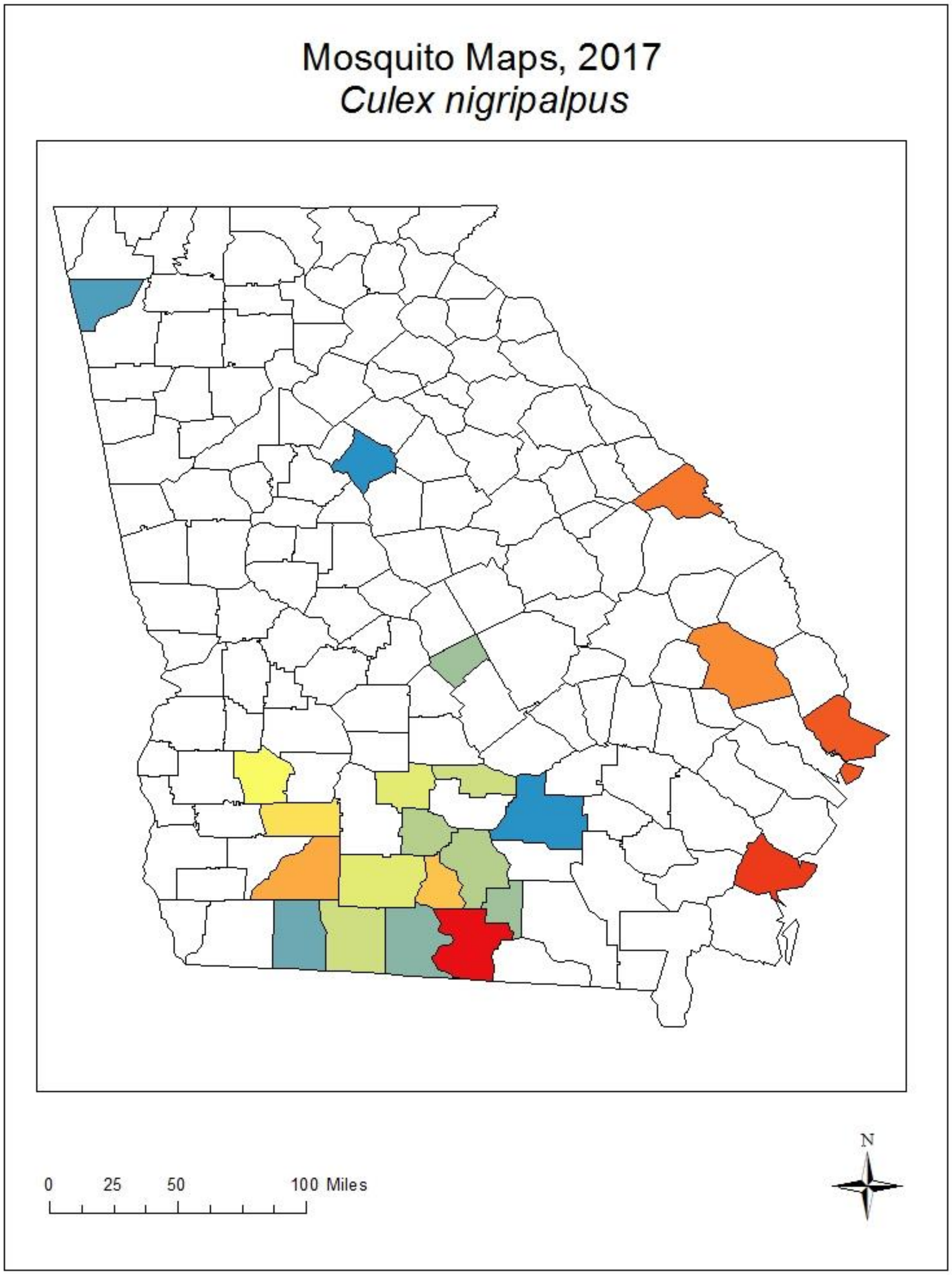
MAPS



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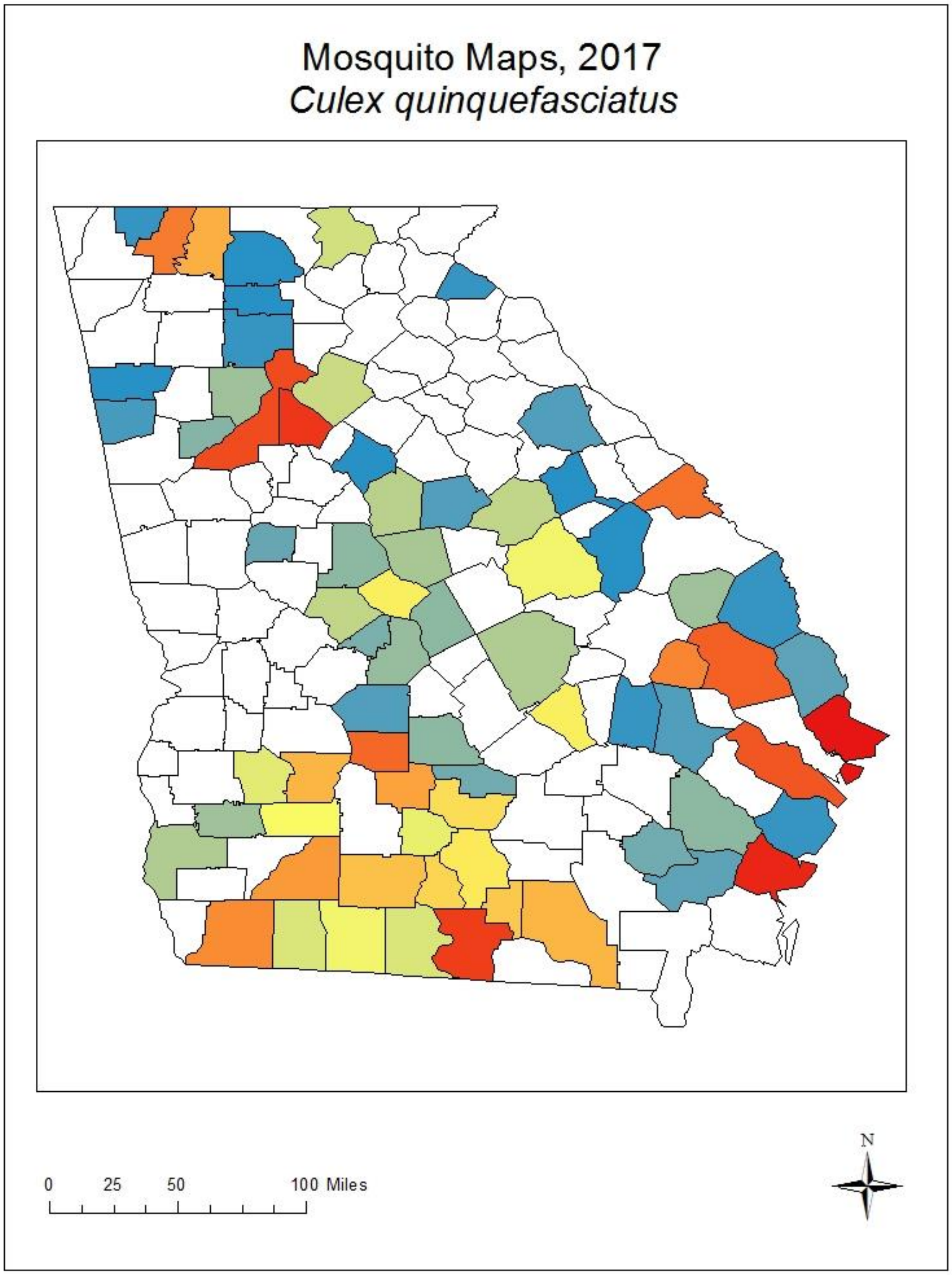
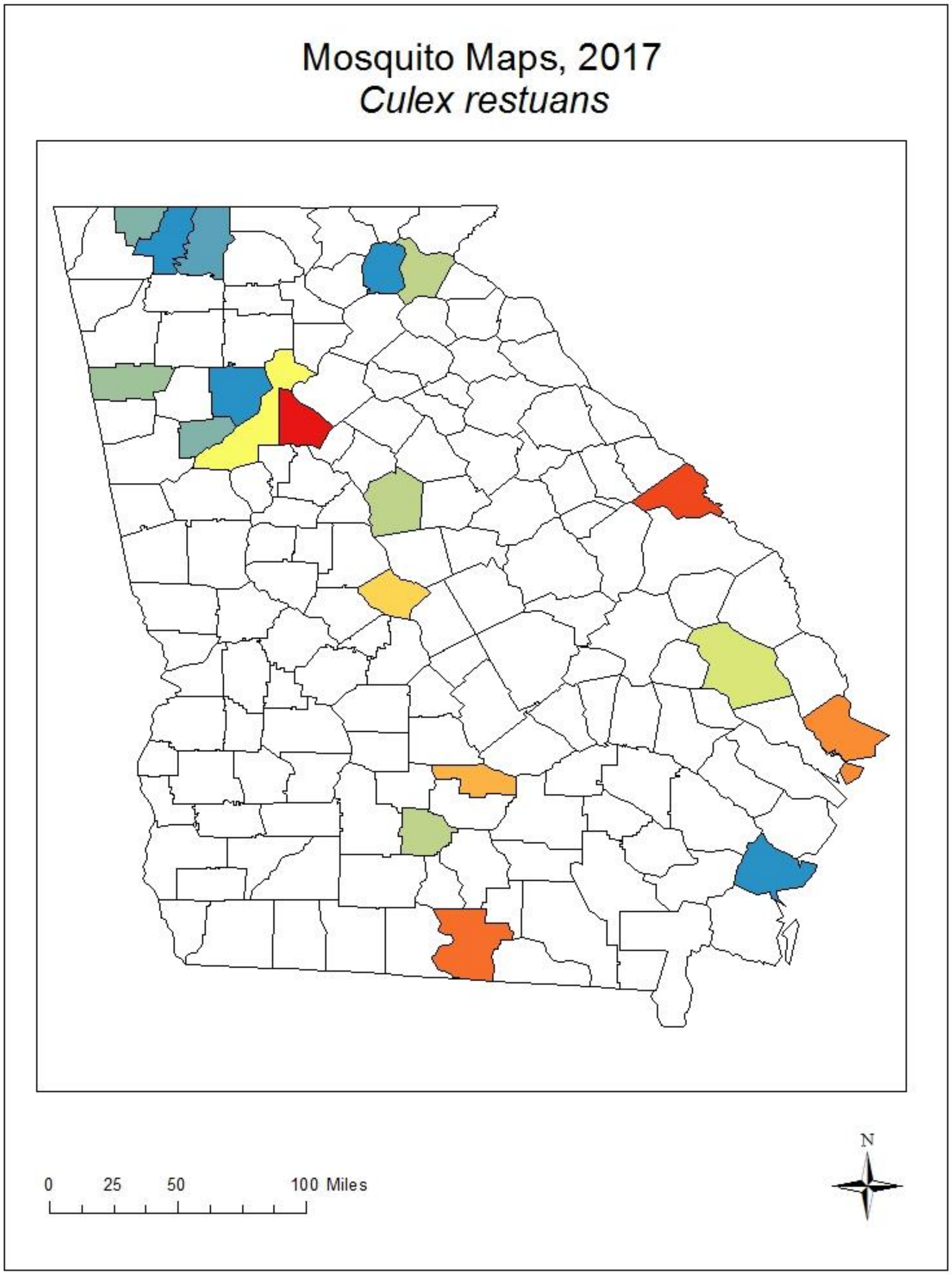
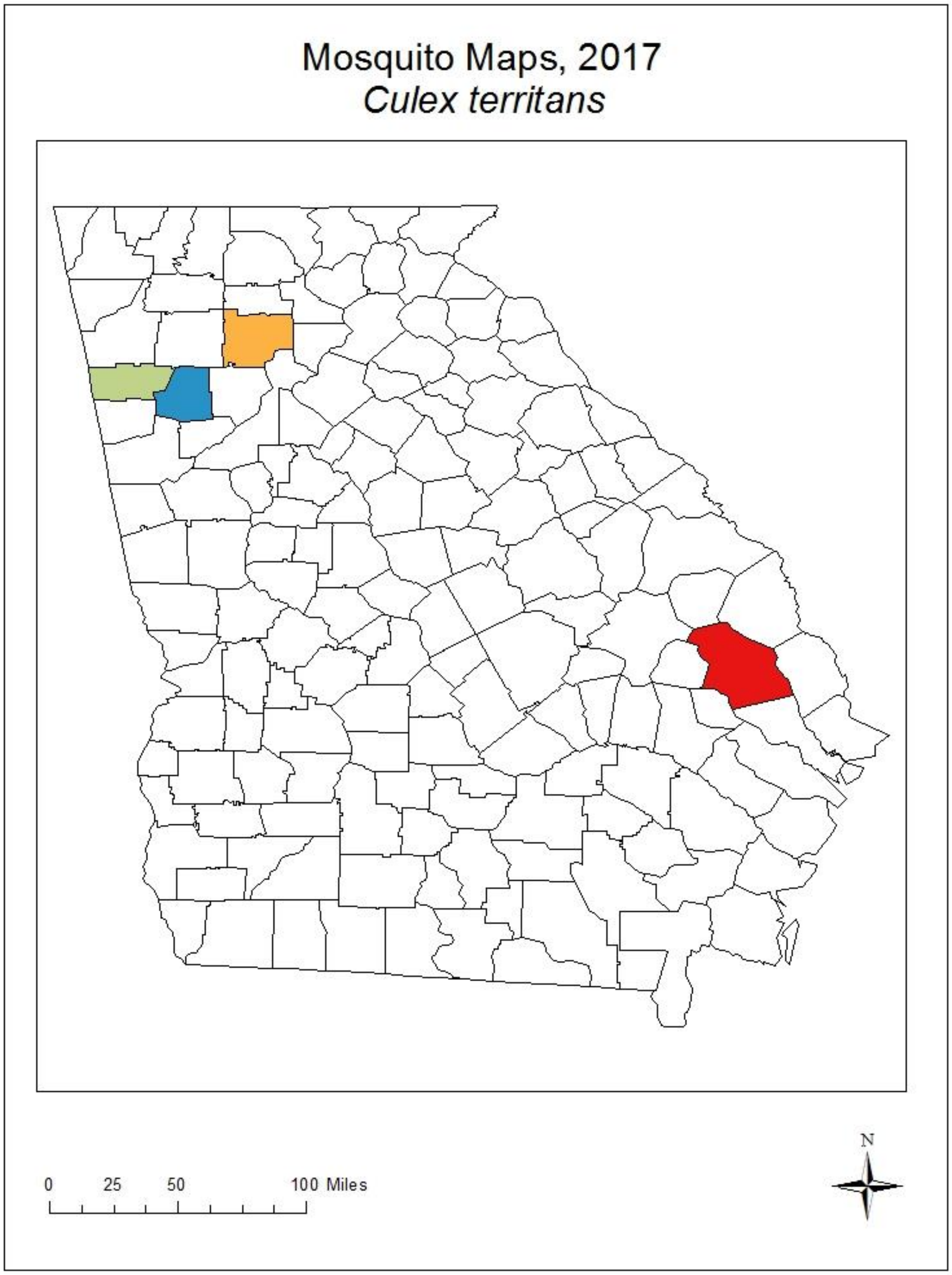


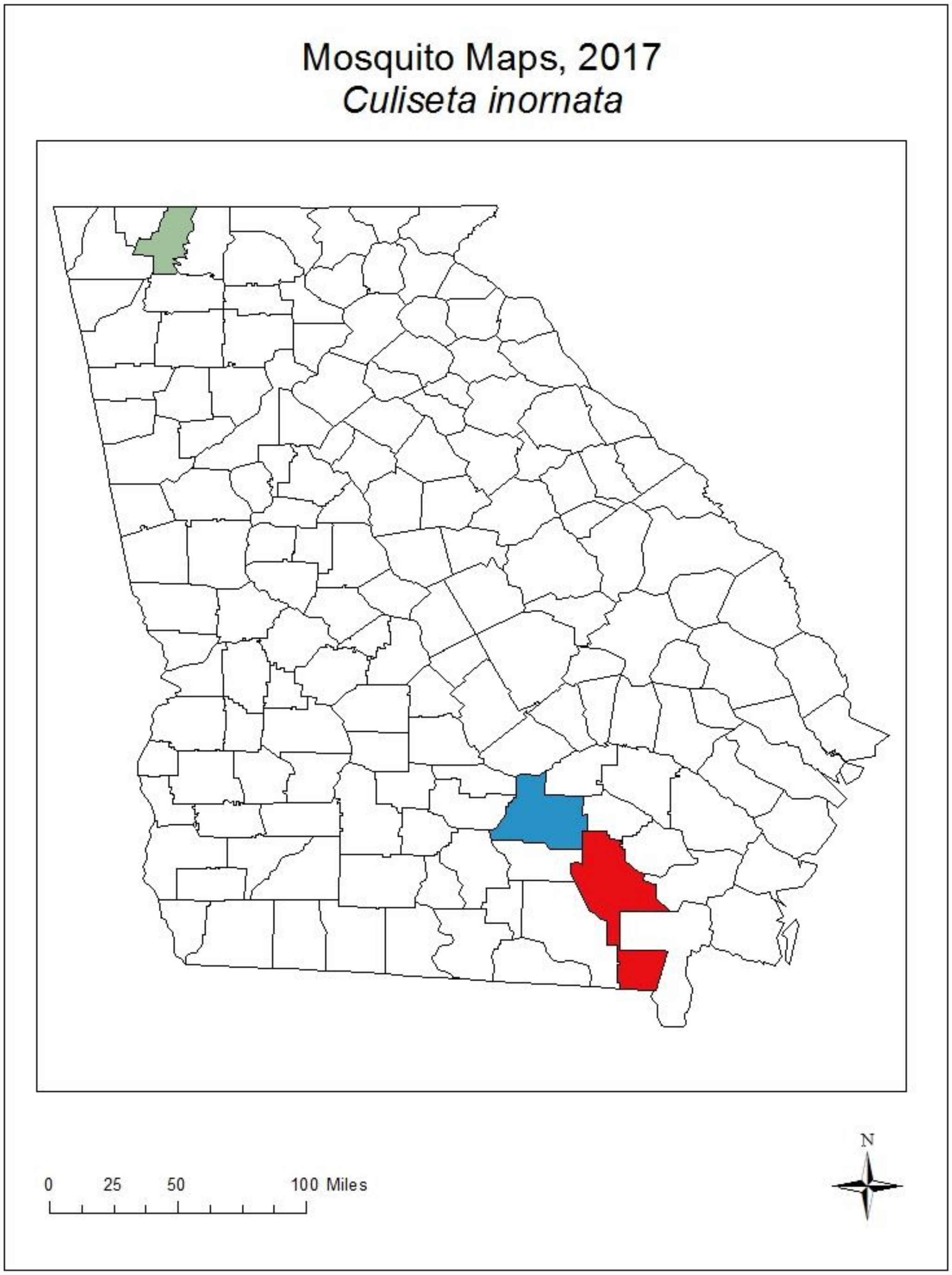
Mosquito Maps, 2017
Culex quinquefasciatus
0
25
50
100 Miles
N

MAPS




Mosquito Maps, 2017
Culex territans
0 25 50 100 Miles
N

MAPS



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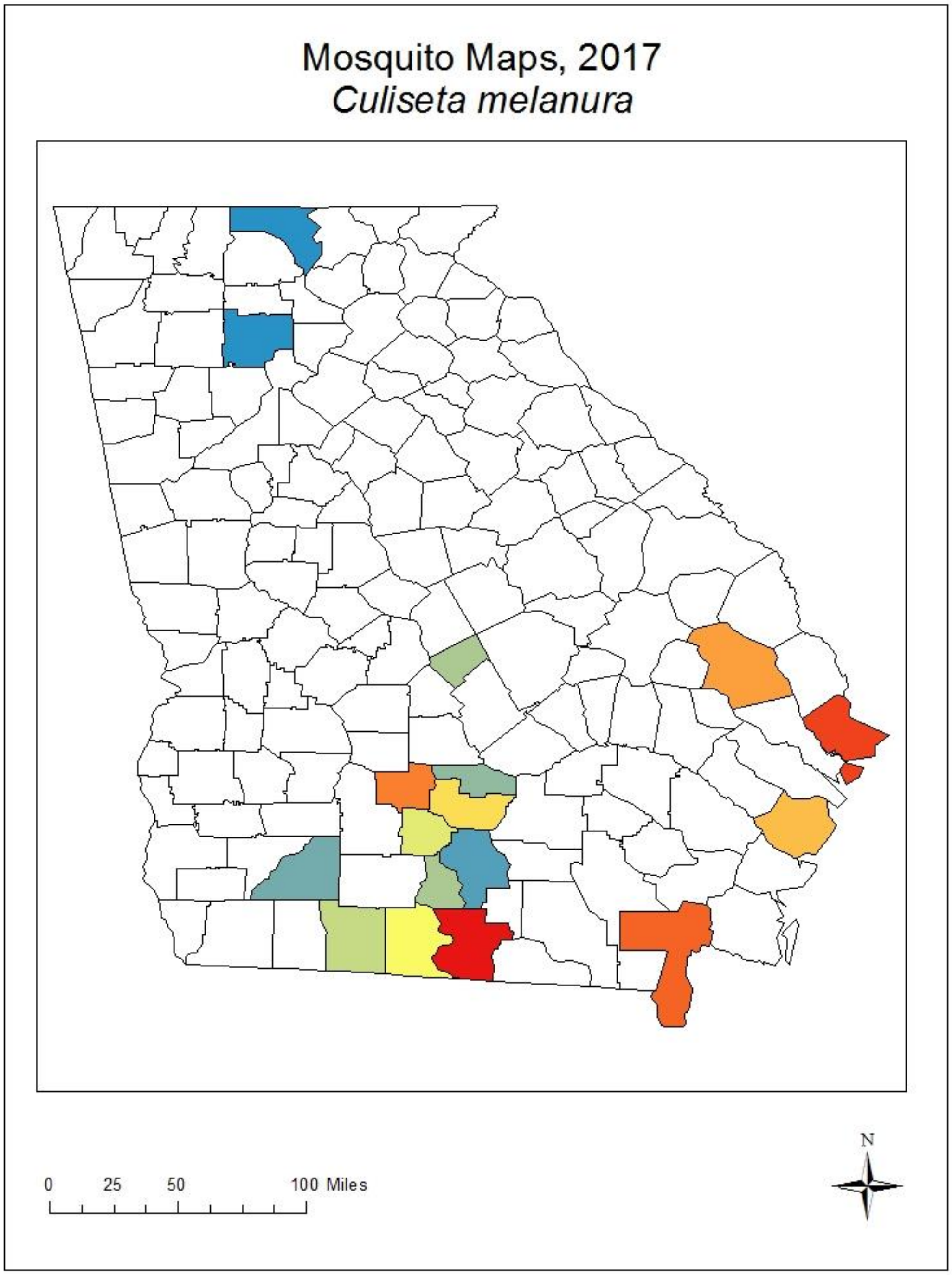

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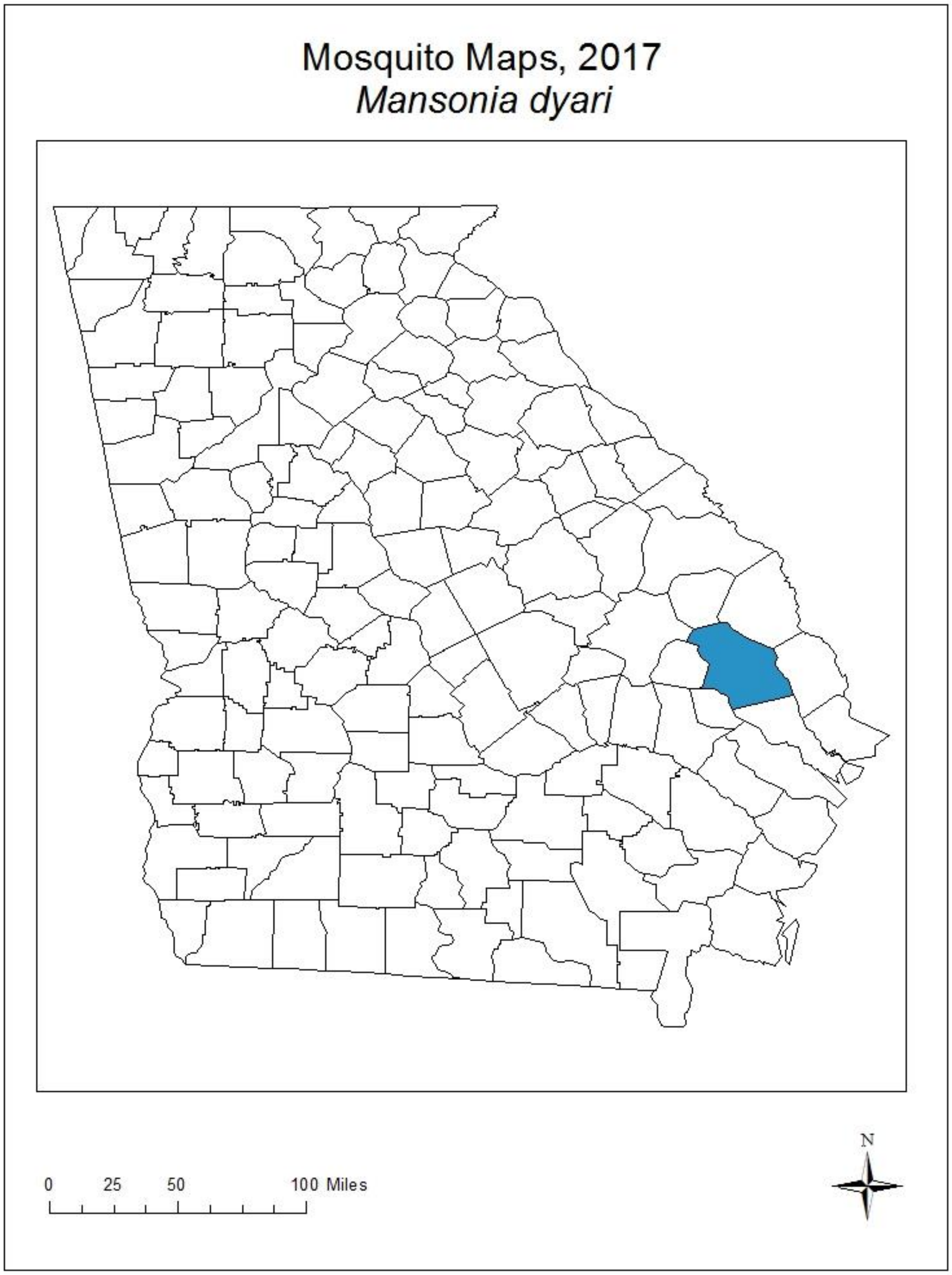
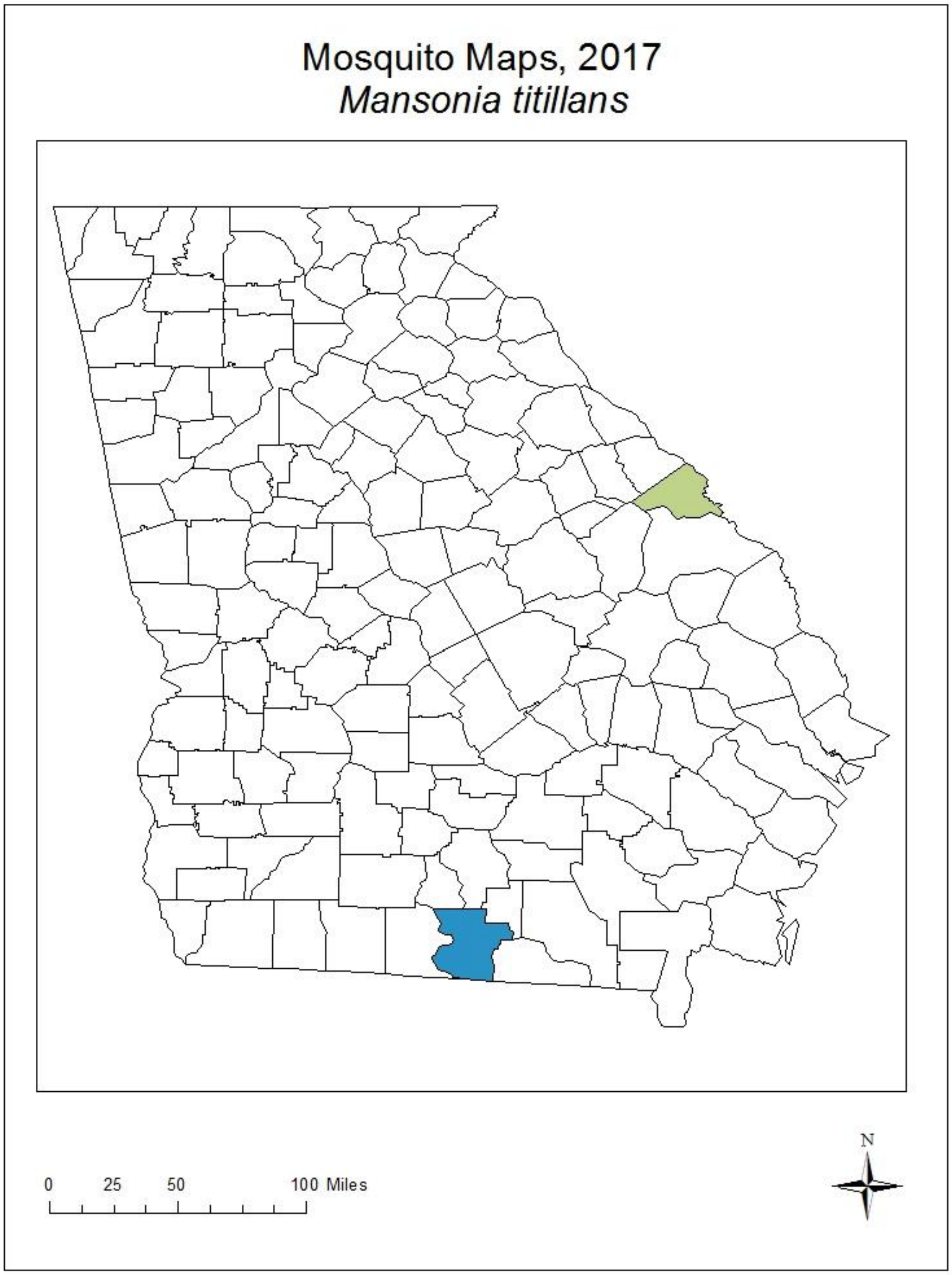
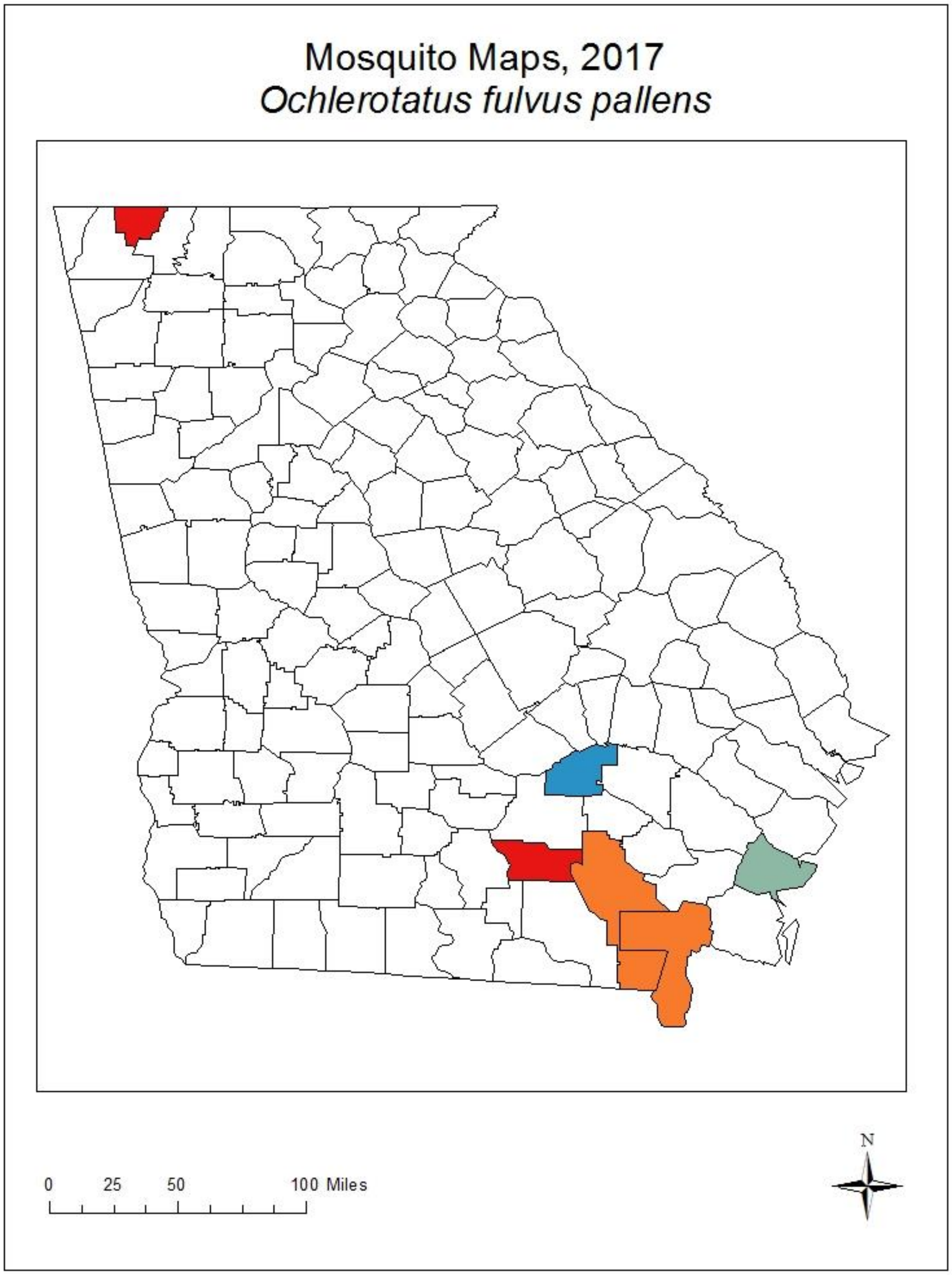



Mosquito Maps, 2017
Mansonia titillans
0 25 50 100 Miles
N

MAPS



Mosquito Maps, 2017
Ochlerotatus fulvus pallens
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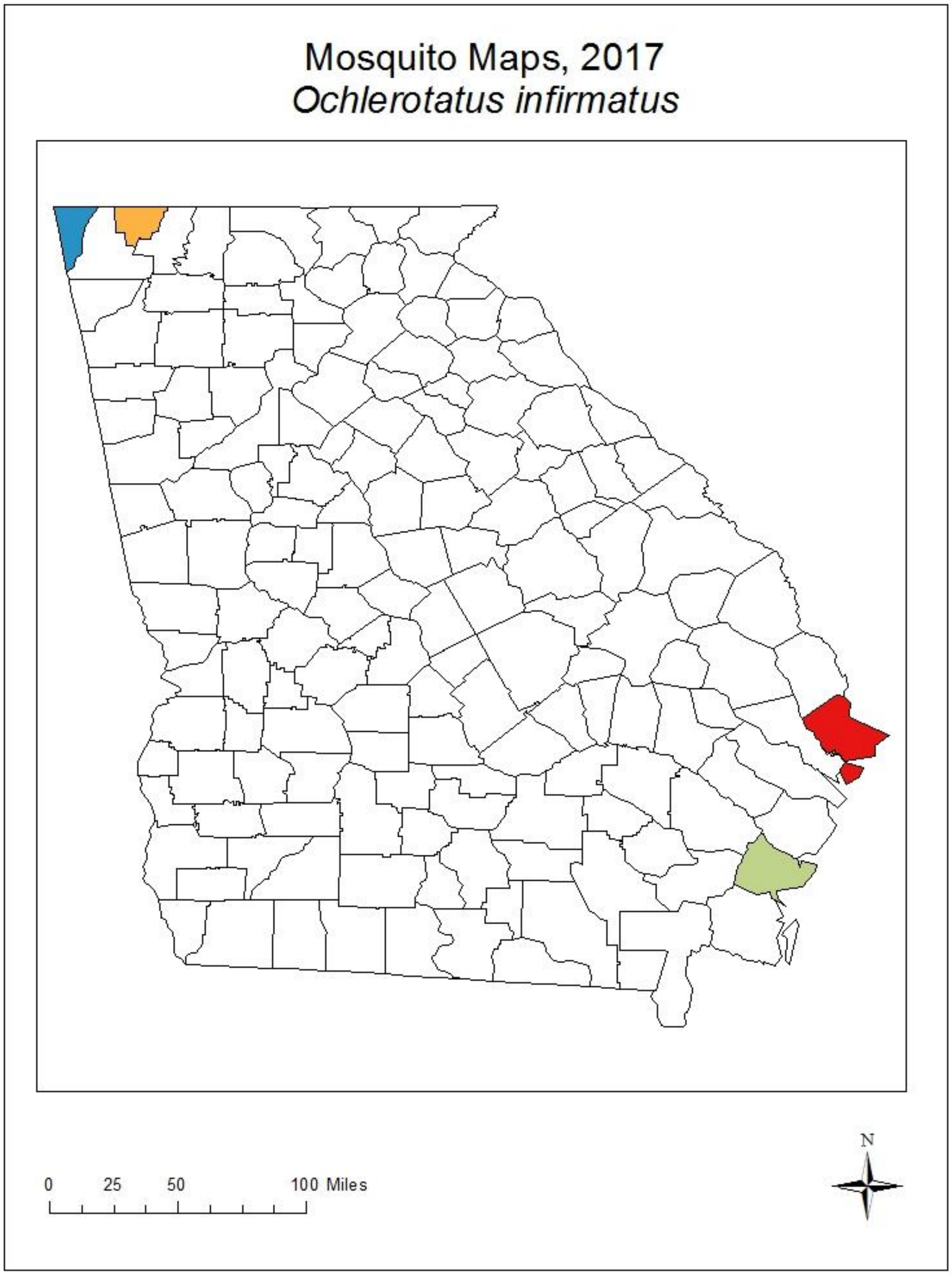
Mosquito Maps, 2017
Ochlerotatus infirmatus
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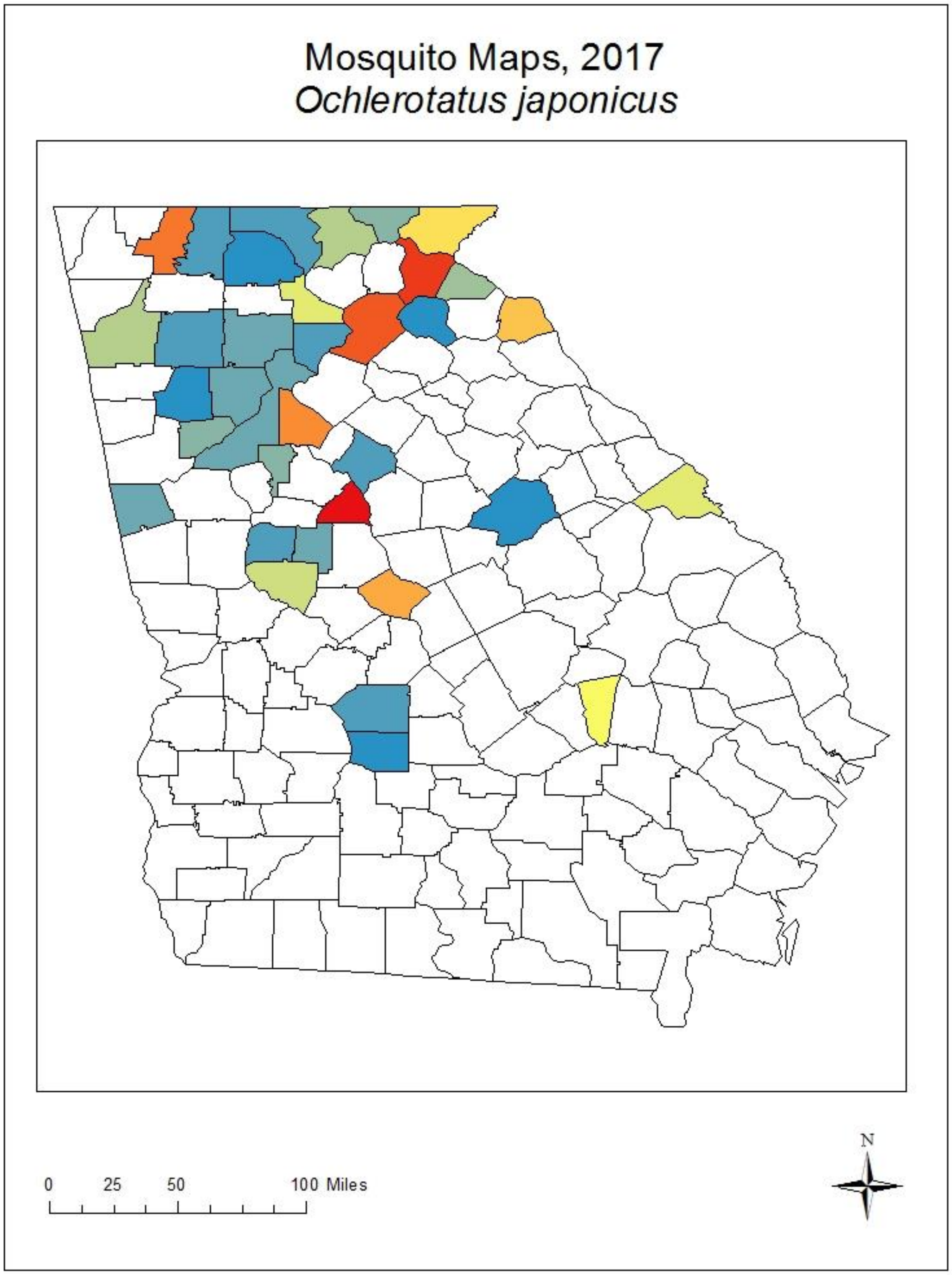
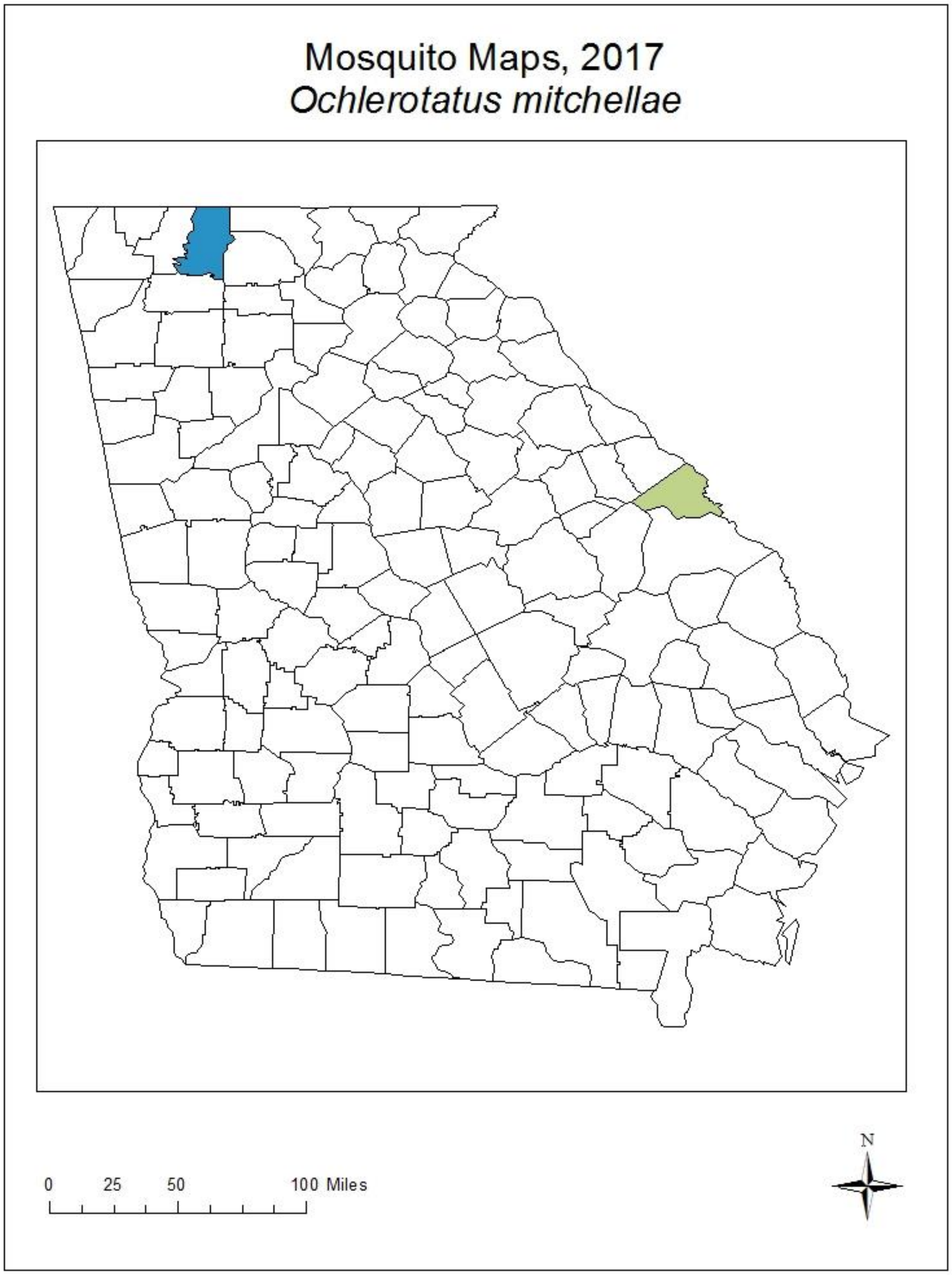


Mosquito Maps, 2017
Ochlerotatus japonicus
N
0 25 50 100 Miles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Ochlerotatus mitchellae
0 25 50 100 Miles
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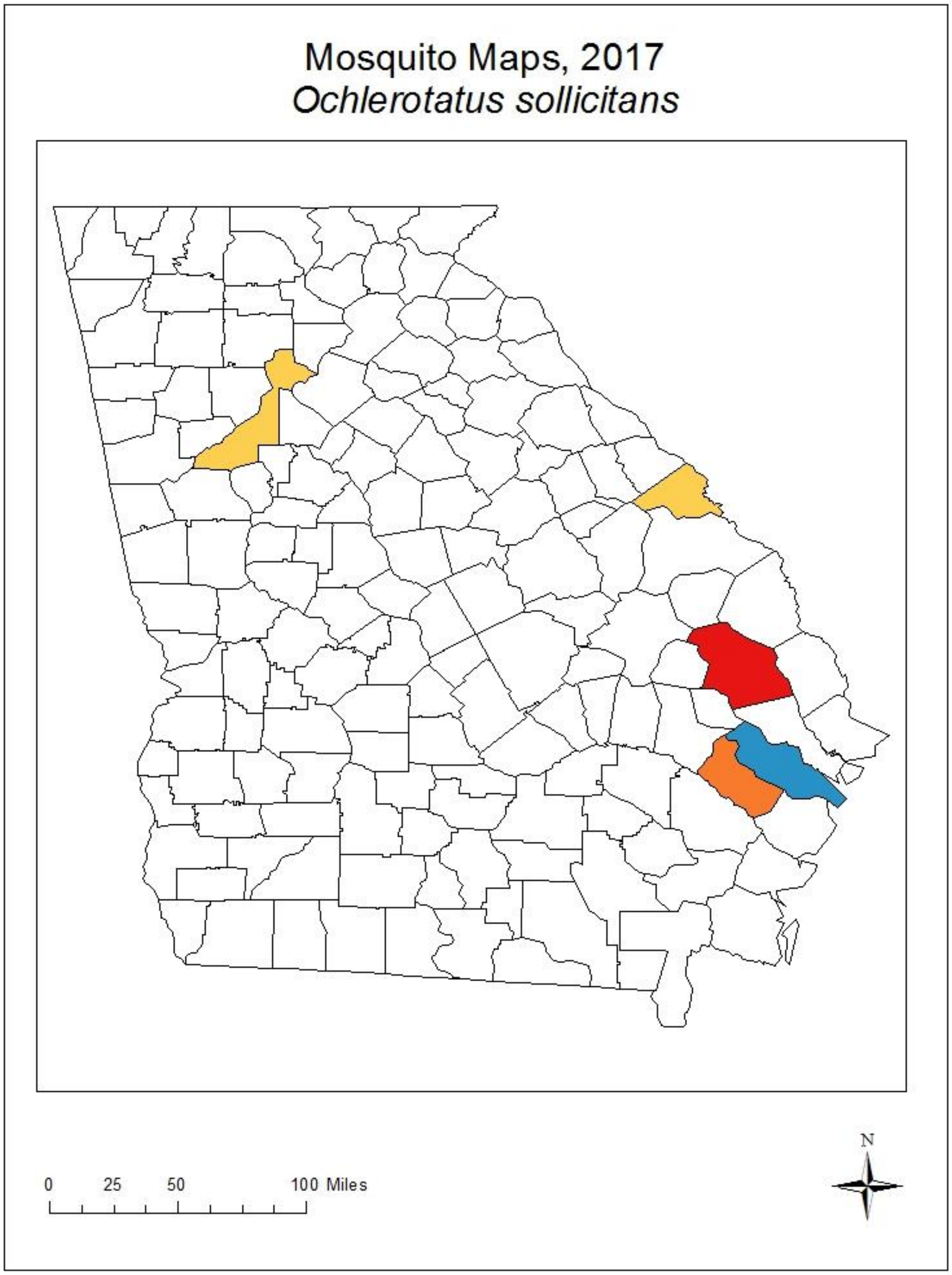
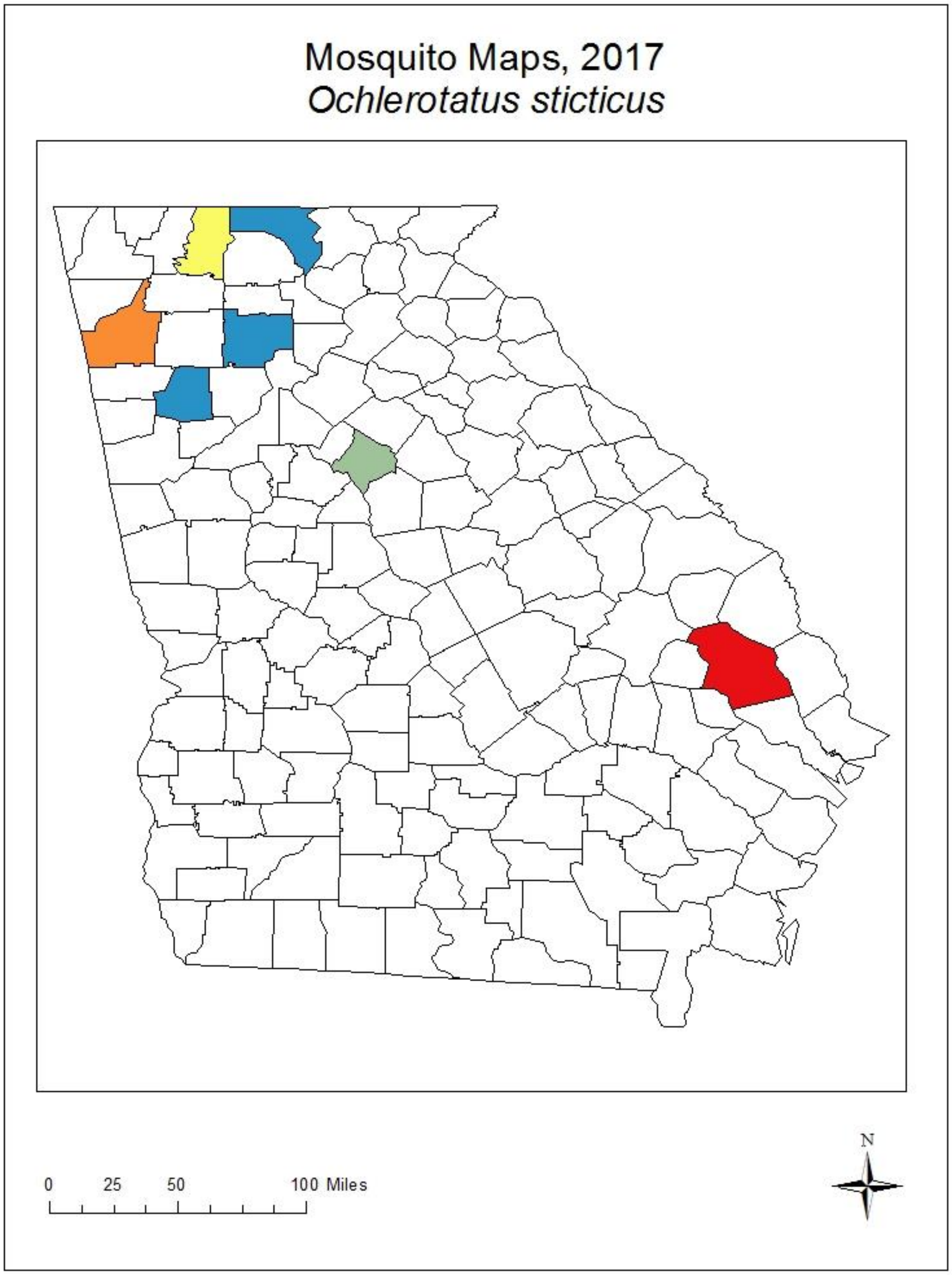
MAPS



Mosquito Maps, 2017
Ochlerotatus sollicitans
0
25
50
100 Miles
N


Mosquito Maps, 2017
Ochlerotatus sticticus
0 25 50 100 Miles
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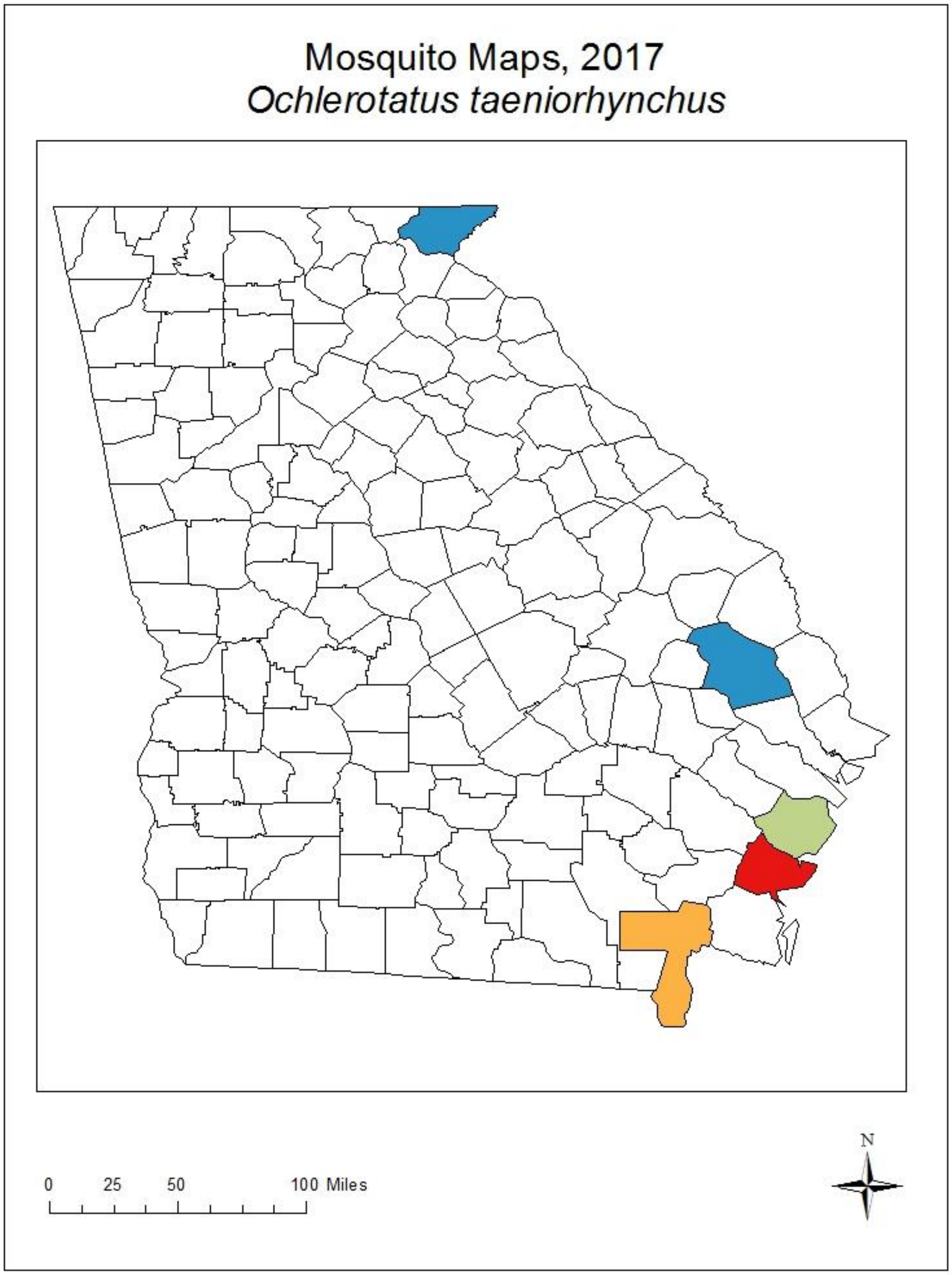
MAPS



Mosquito Maps, 2017
Ochlerotatus taeniorhynchus
0 25 50 100 Miles
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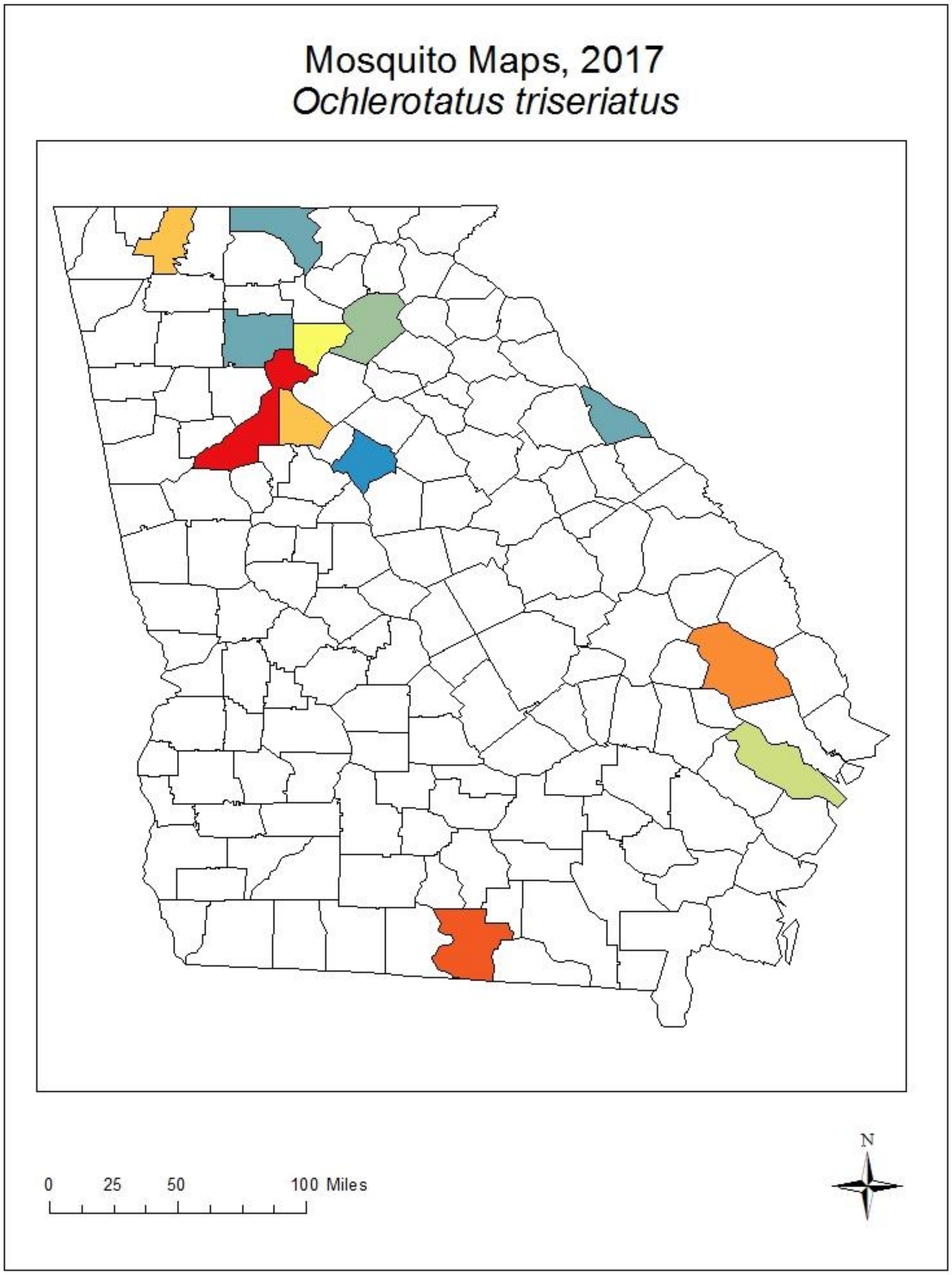
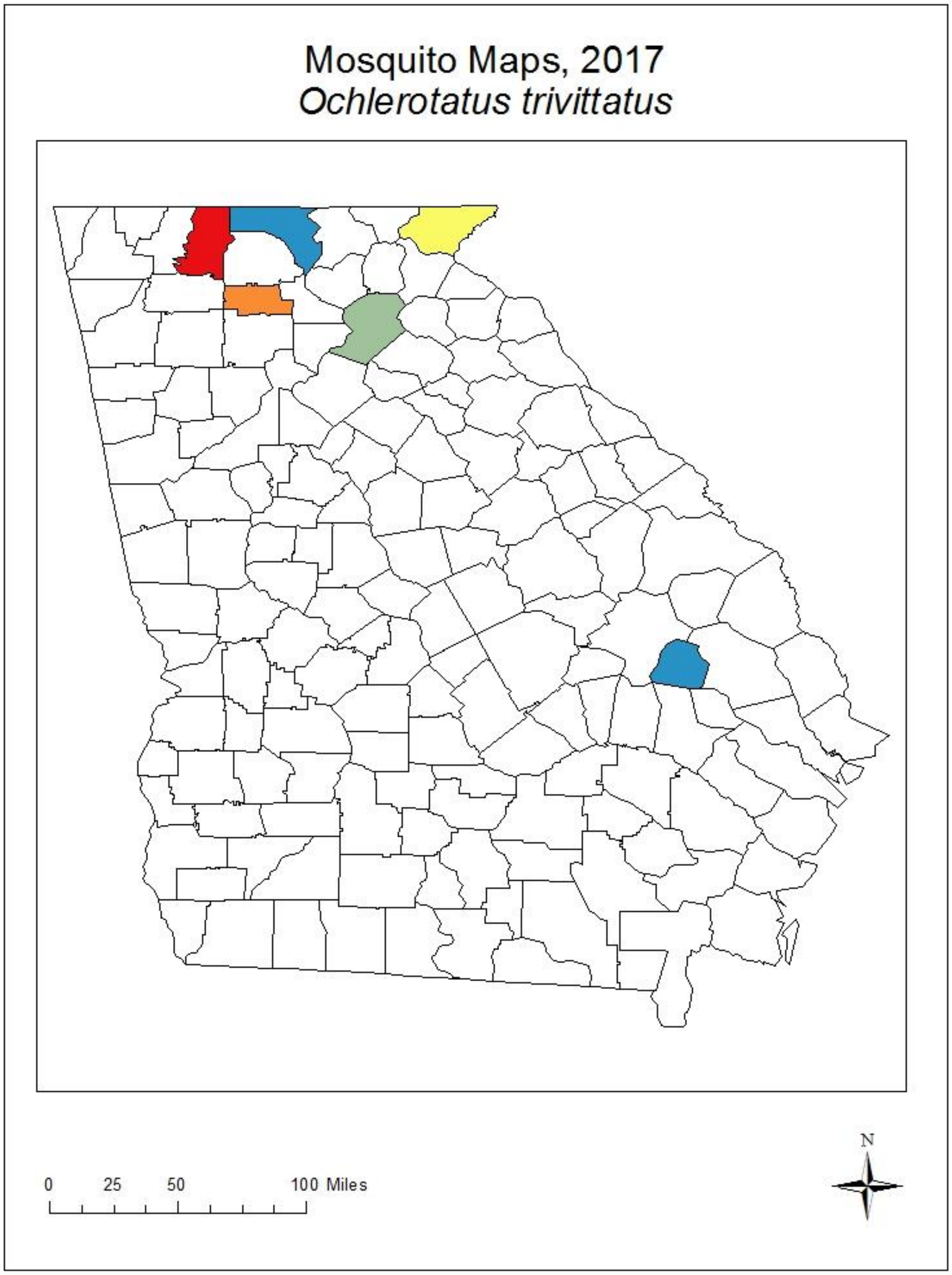
MAPS



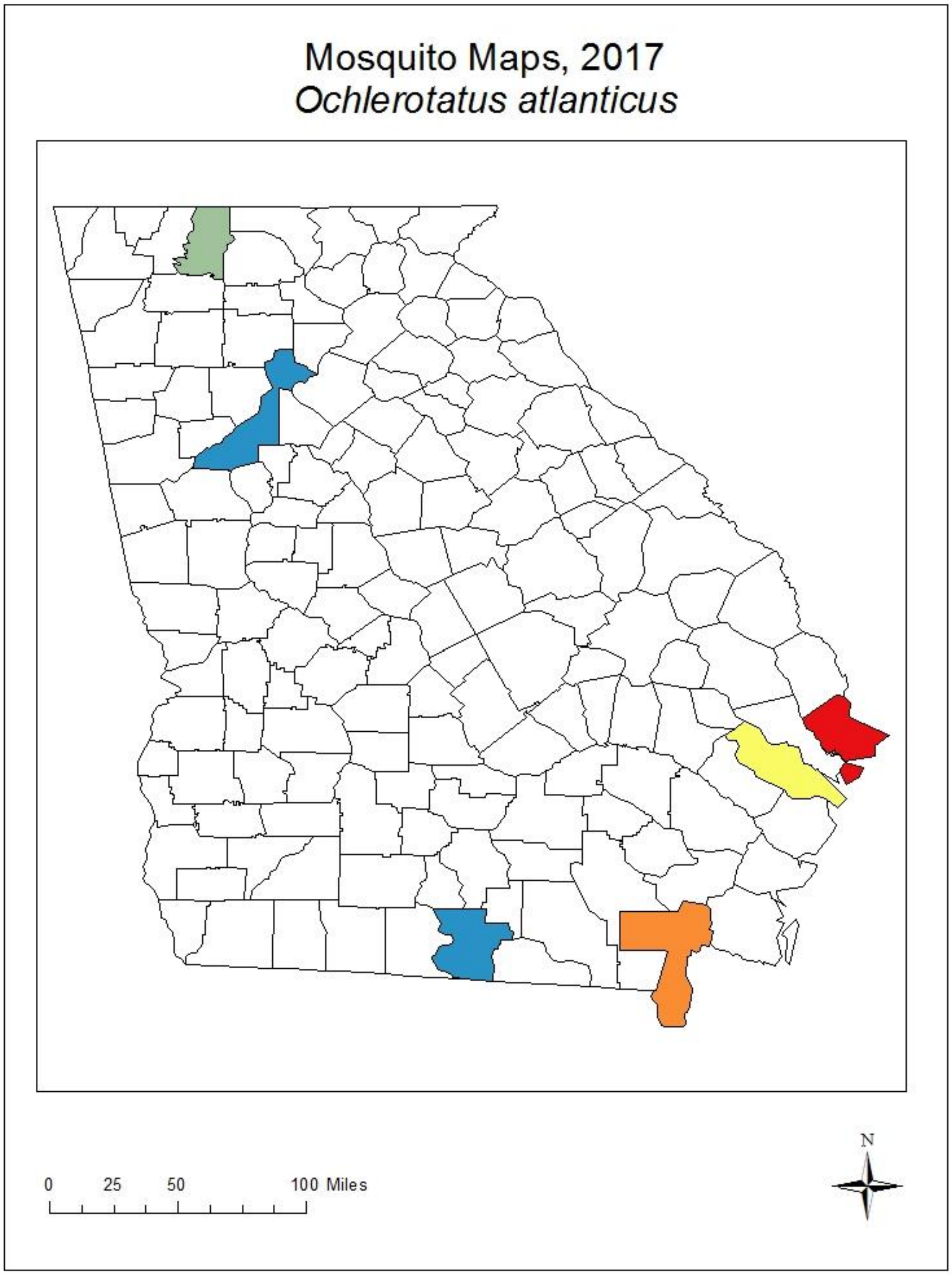
Mosquito Maps, 2017
Ochlerotatus triseriatus
0 25 50 100 Miles
N

MAPS



Mosquito Maps, 2017
Ochlerotatus trivittatus
0 25 50 100 Miles
N

MAPS


Mosquito Maps, 2017
Ochlerotatus atlanticus
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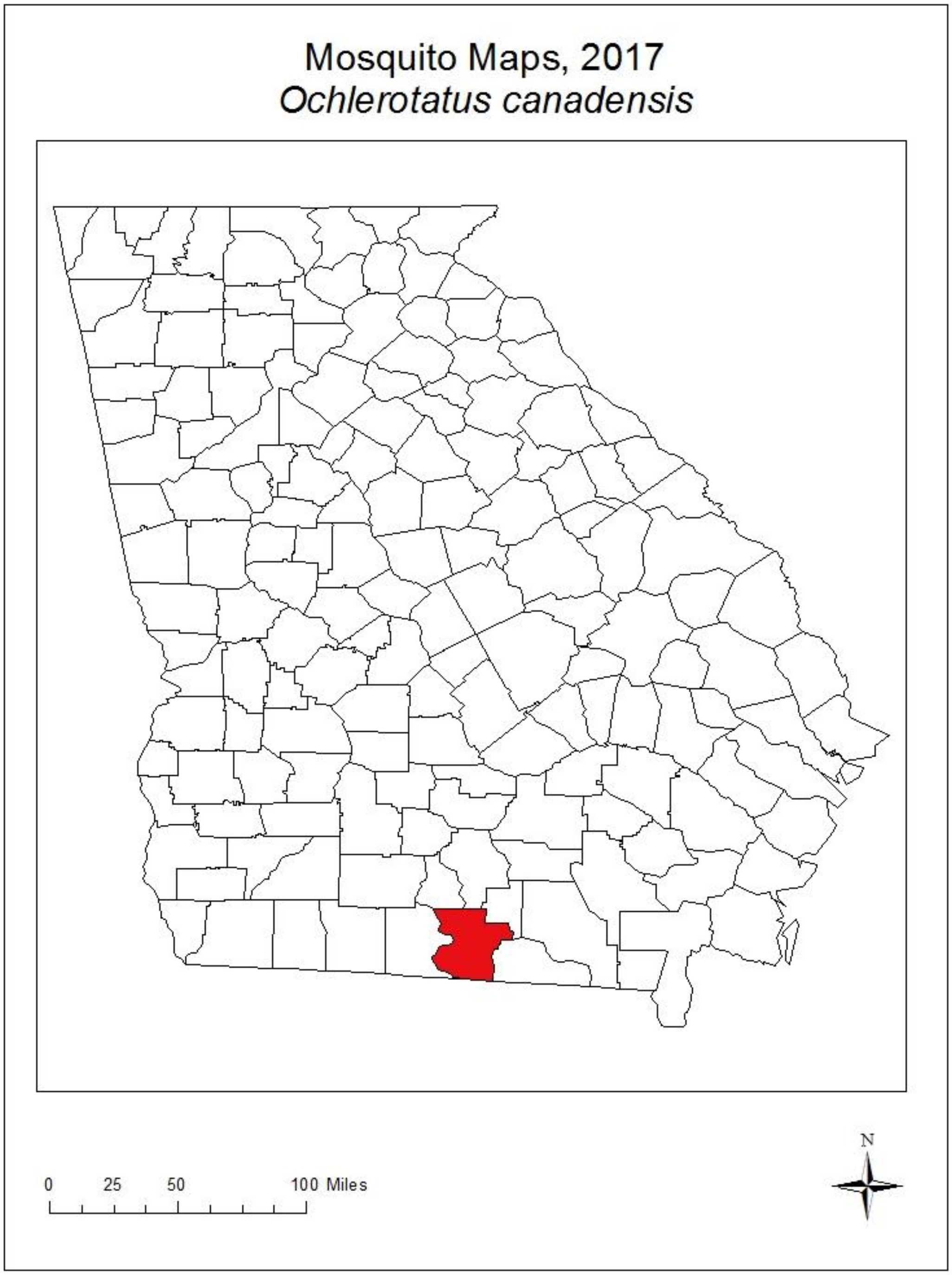
Mosquito Maps, 2017
Ochlerotatus canadensis
0 25 50 100 Miles
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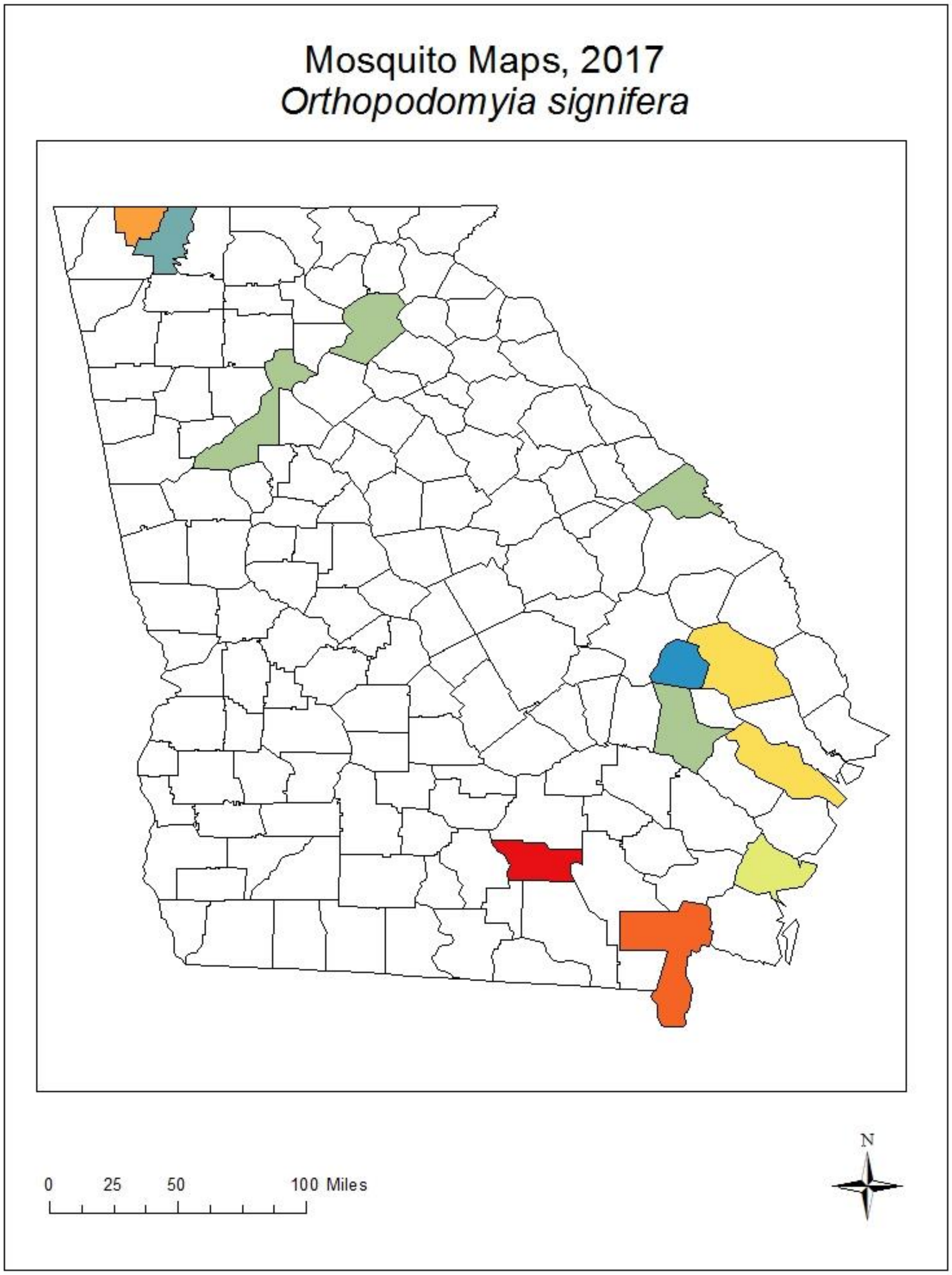
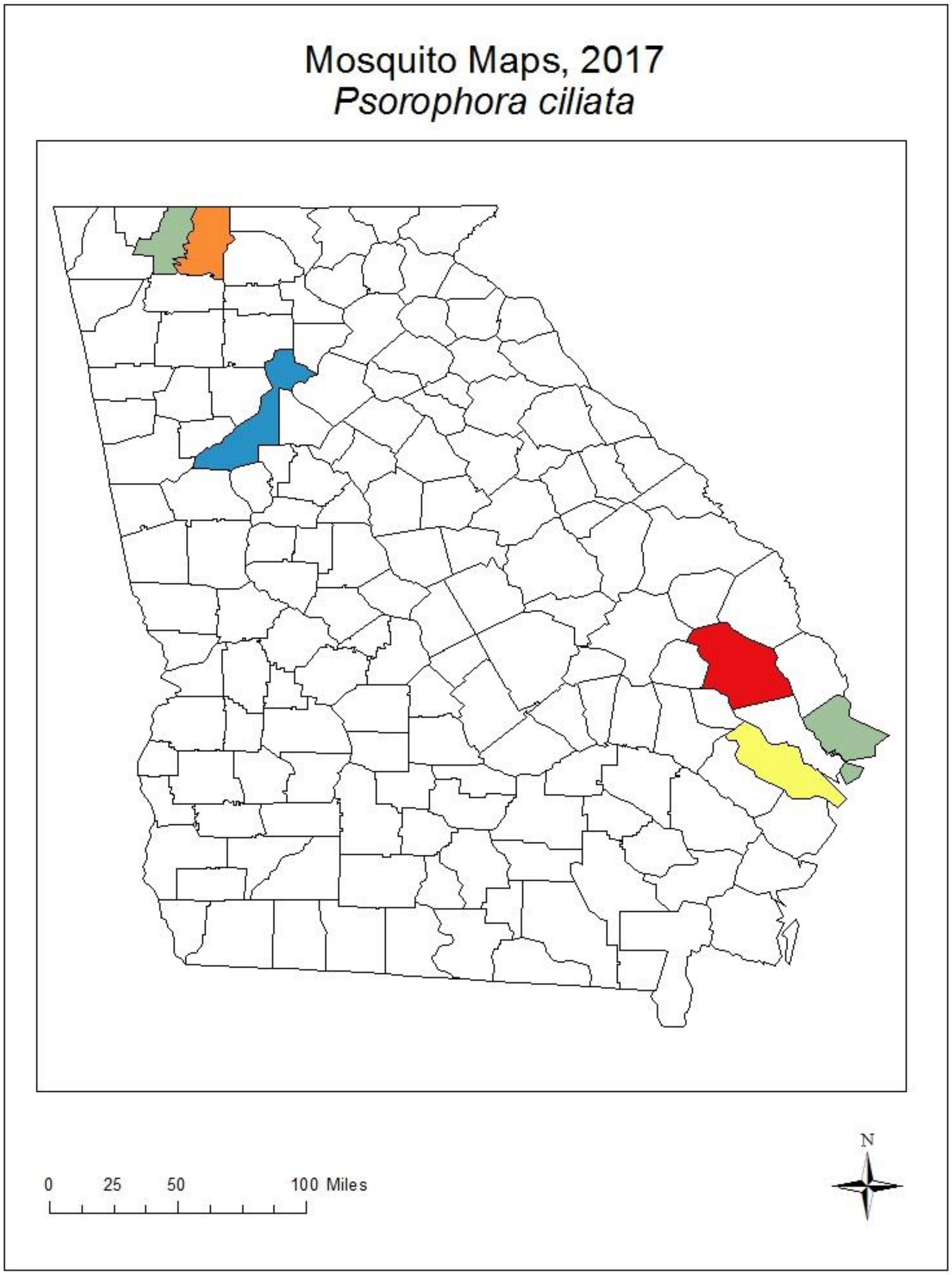
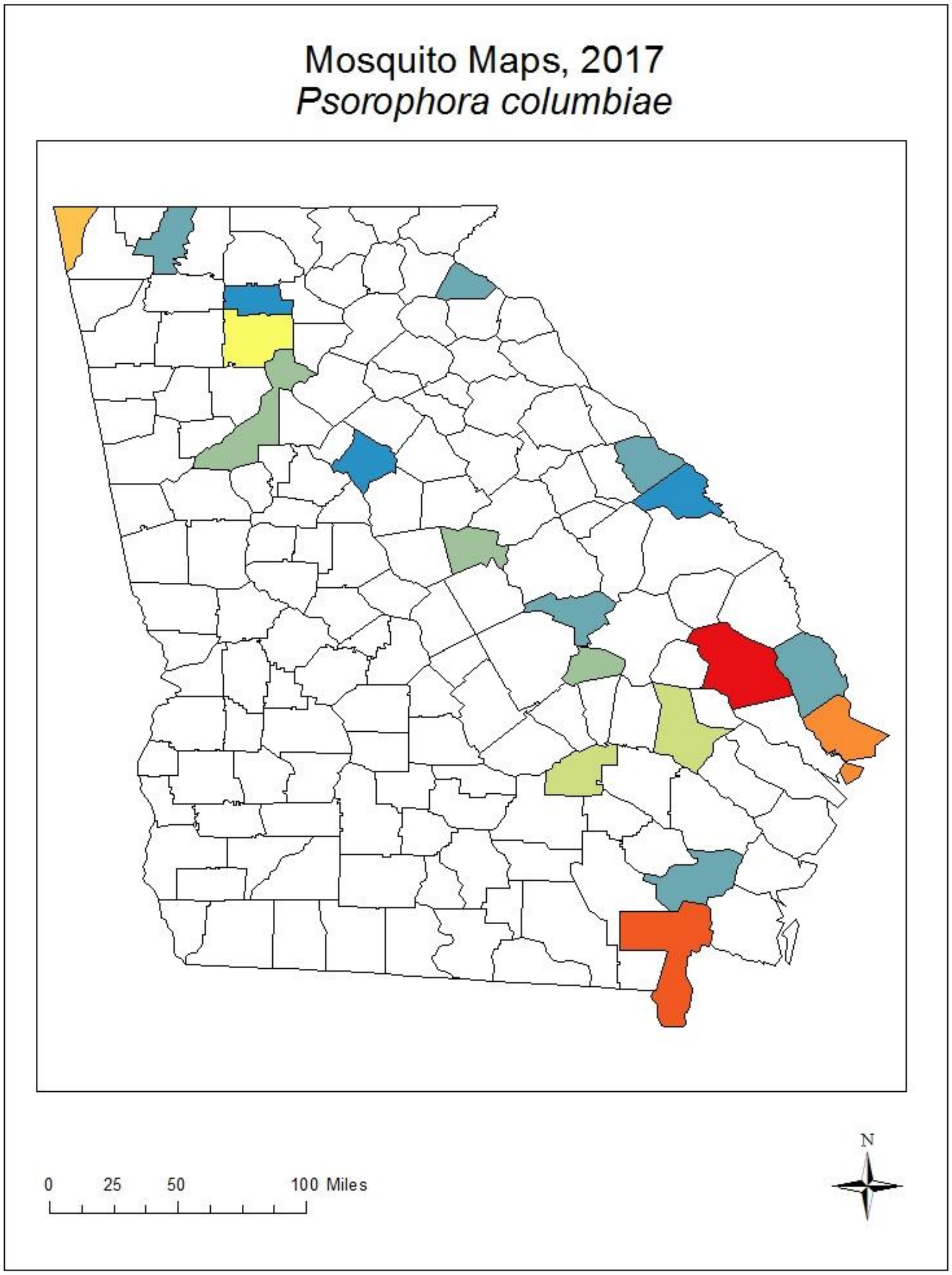
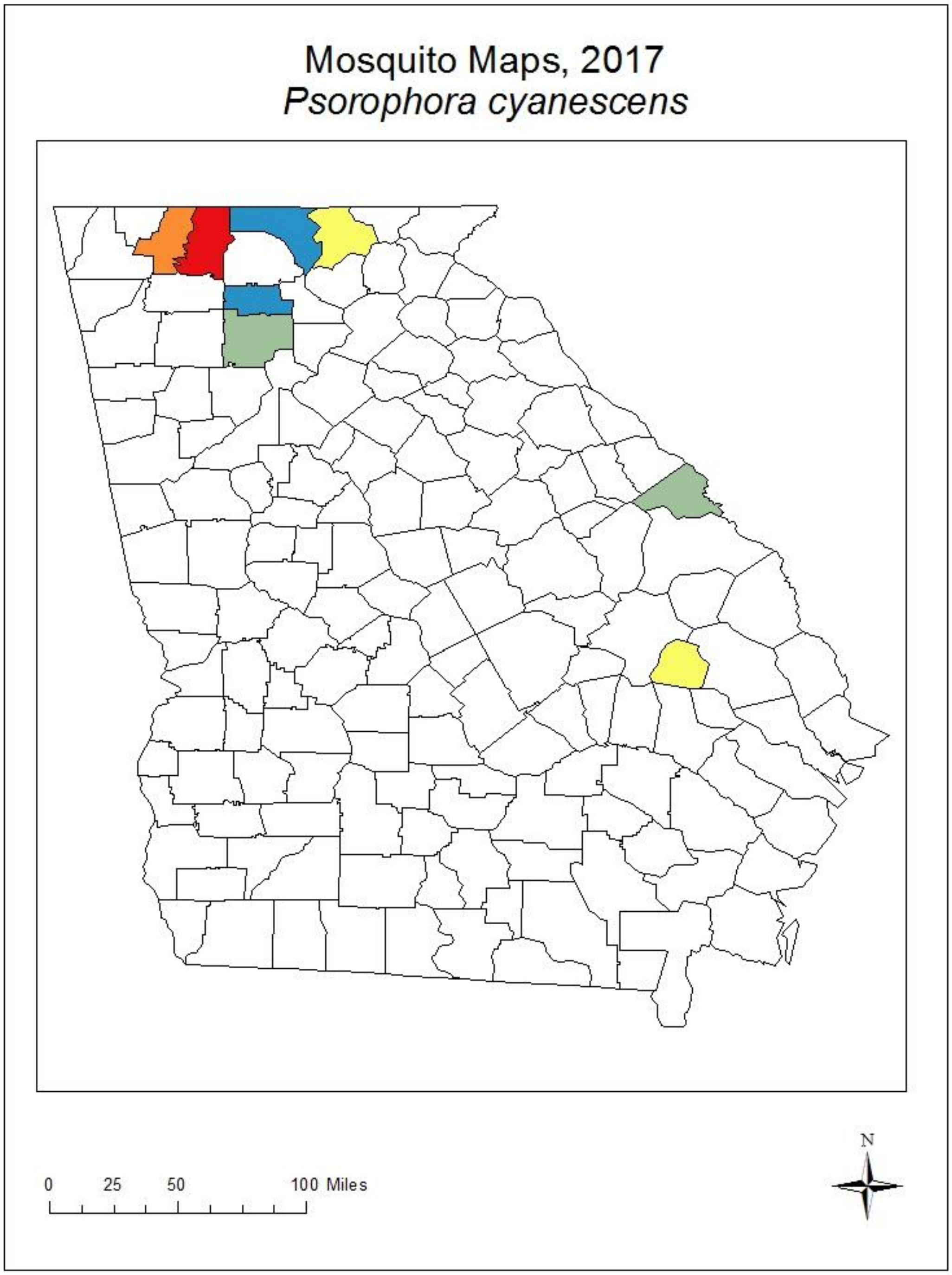


Mosquito Maps, 2017
Orthopodomyia signifera
0
25
50
100 Miles
N

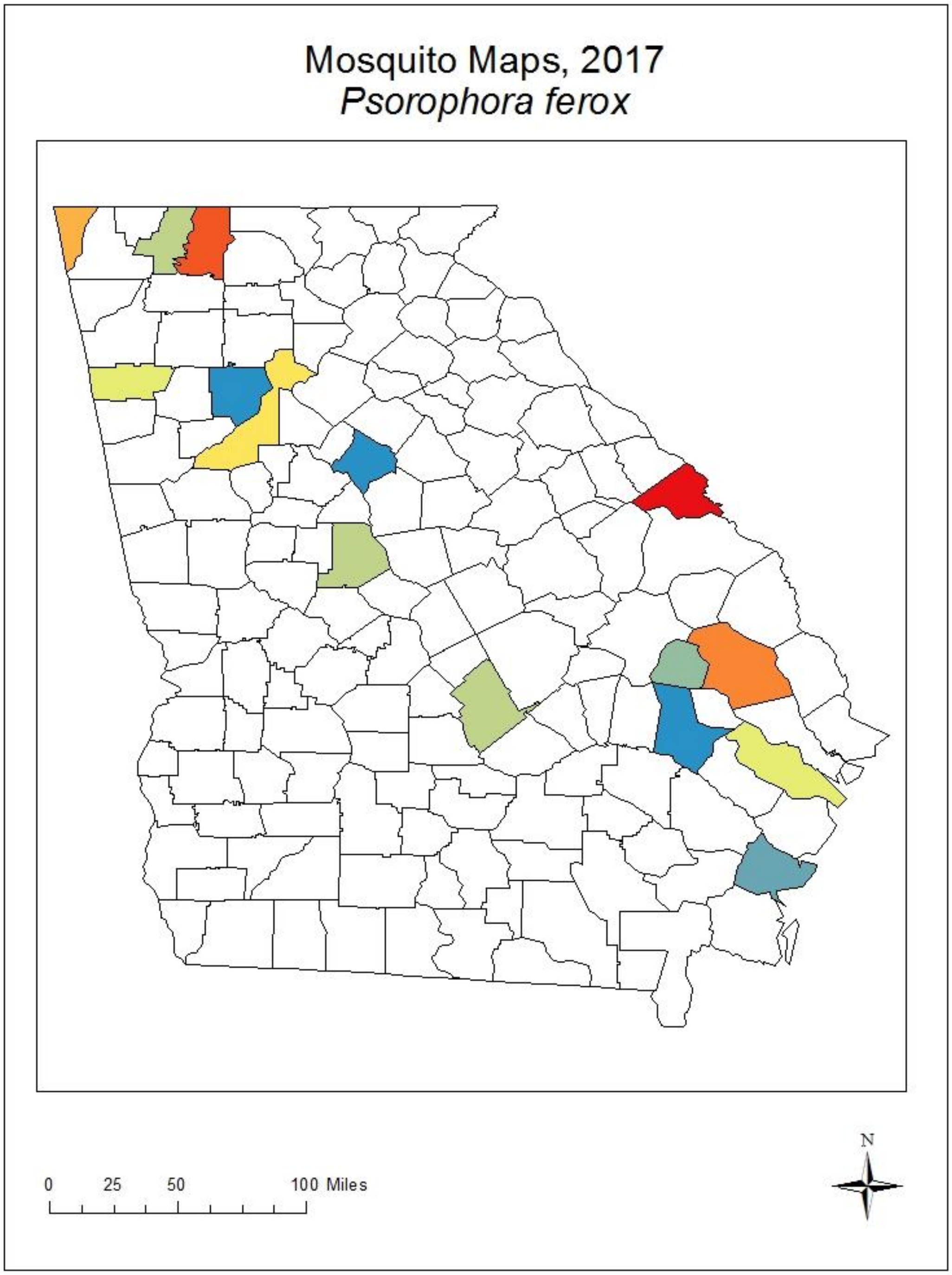
MAPS



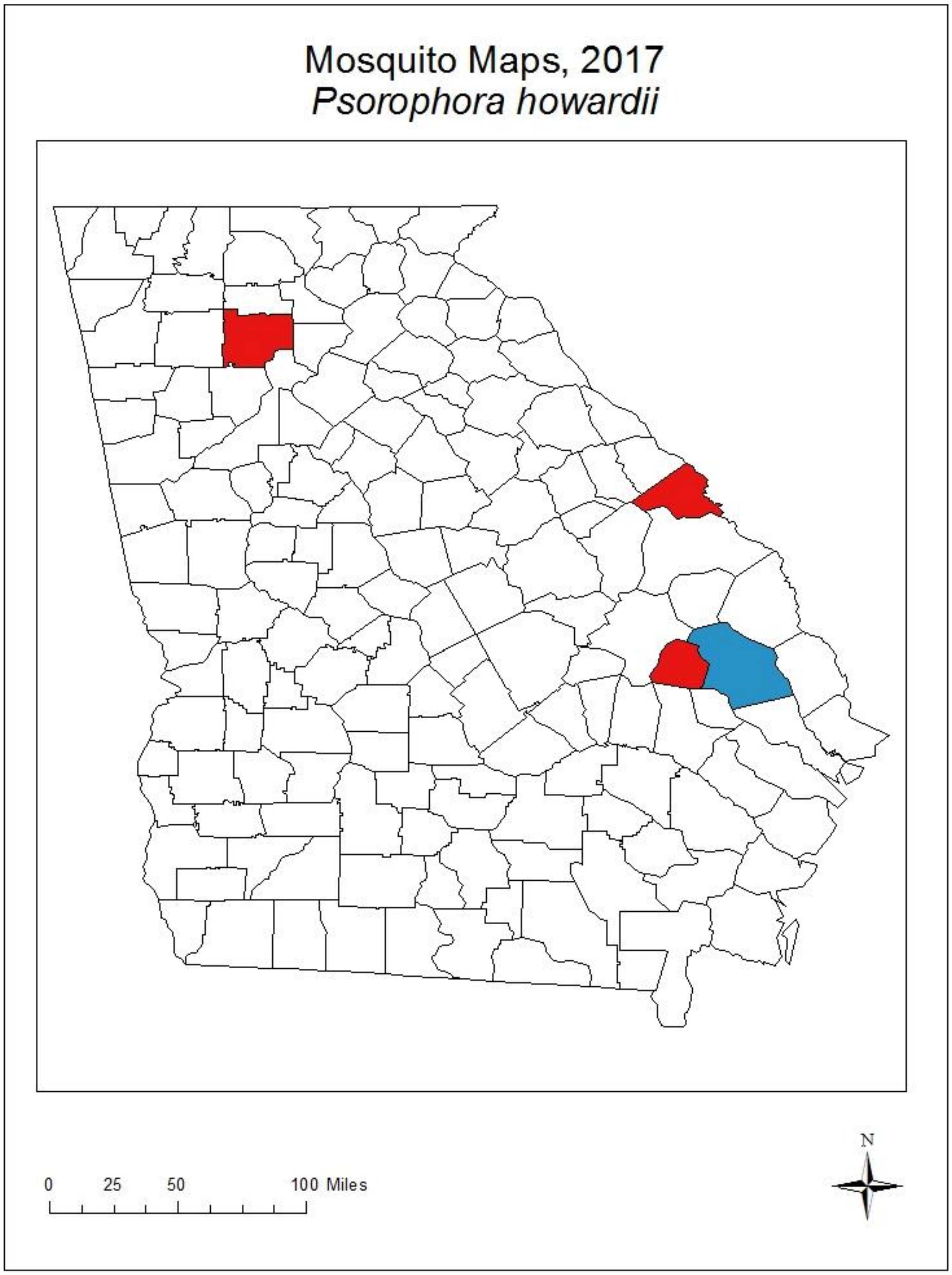

Mosquito Maps, 2017
Psorophora columbiae
0 25 50 100 Miles
N

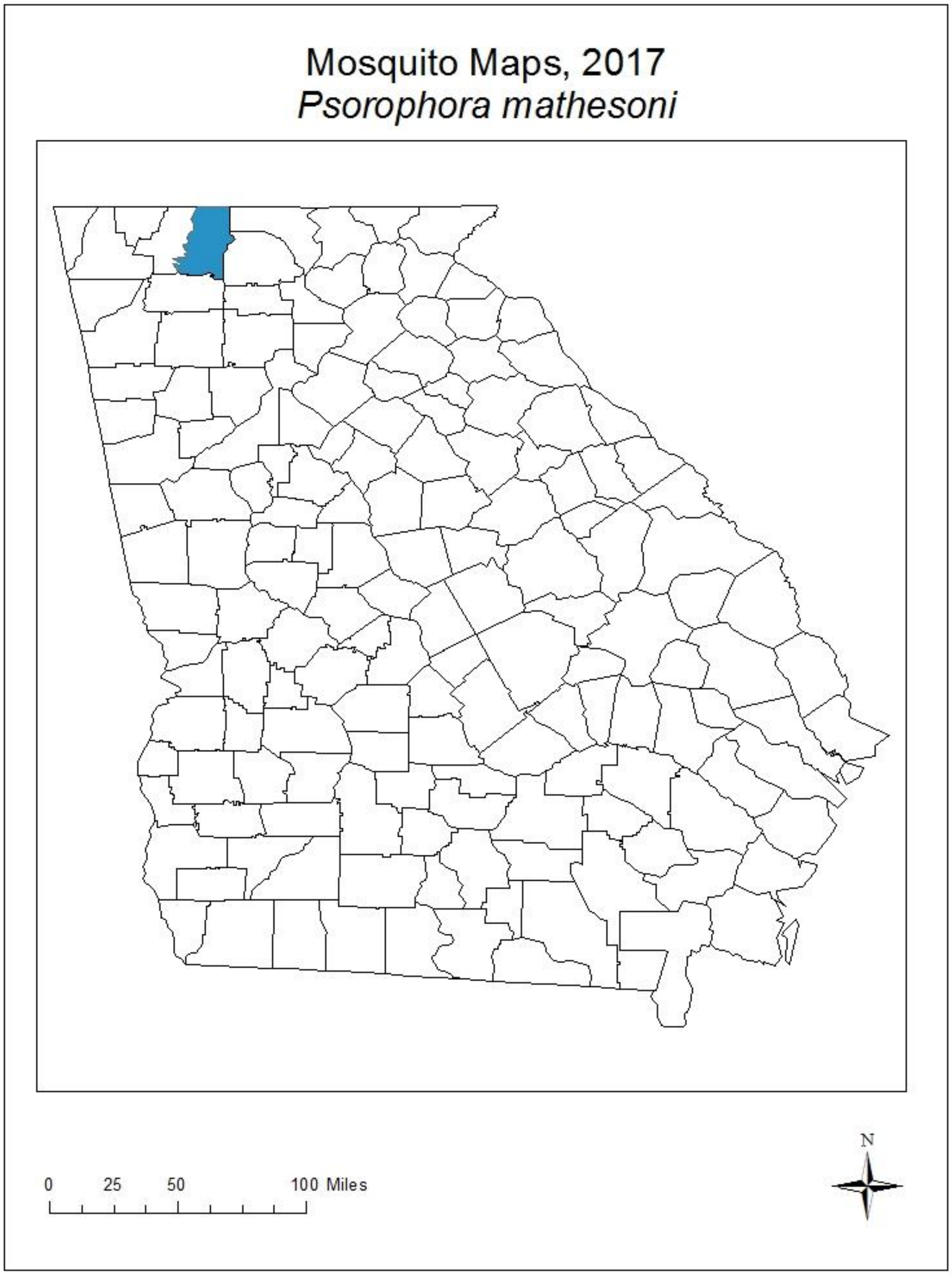

Mosquito Maps, 2017
Psorophora cyanescens
0 25 50 100 Miles
N

MAPS

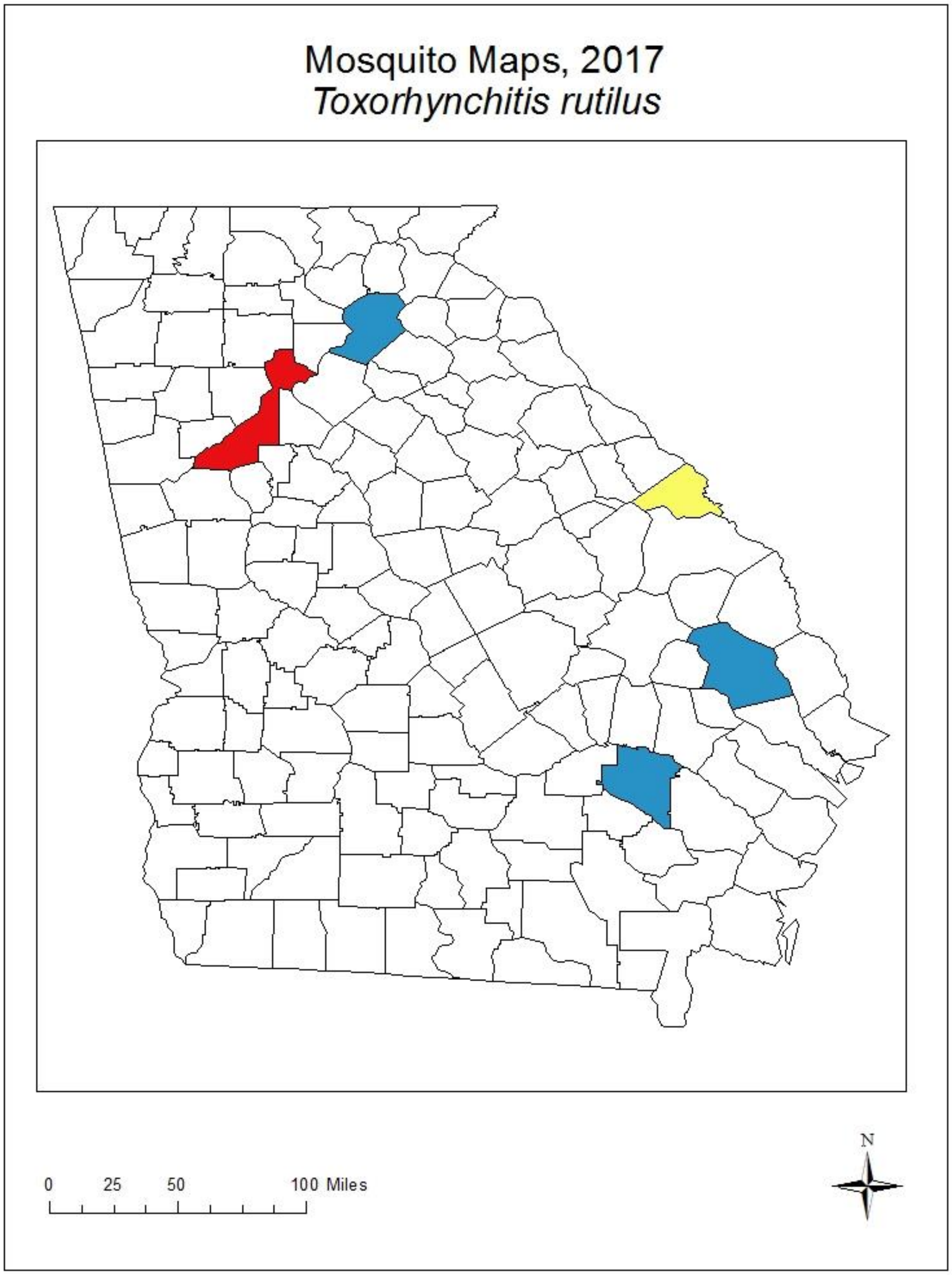


MAPS

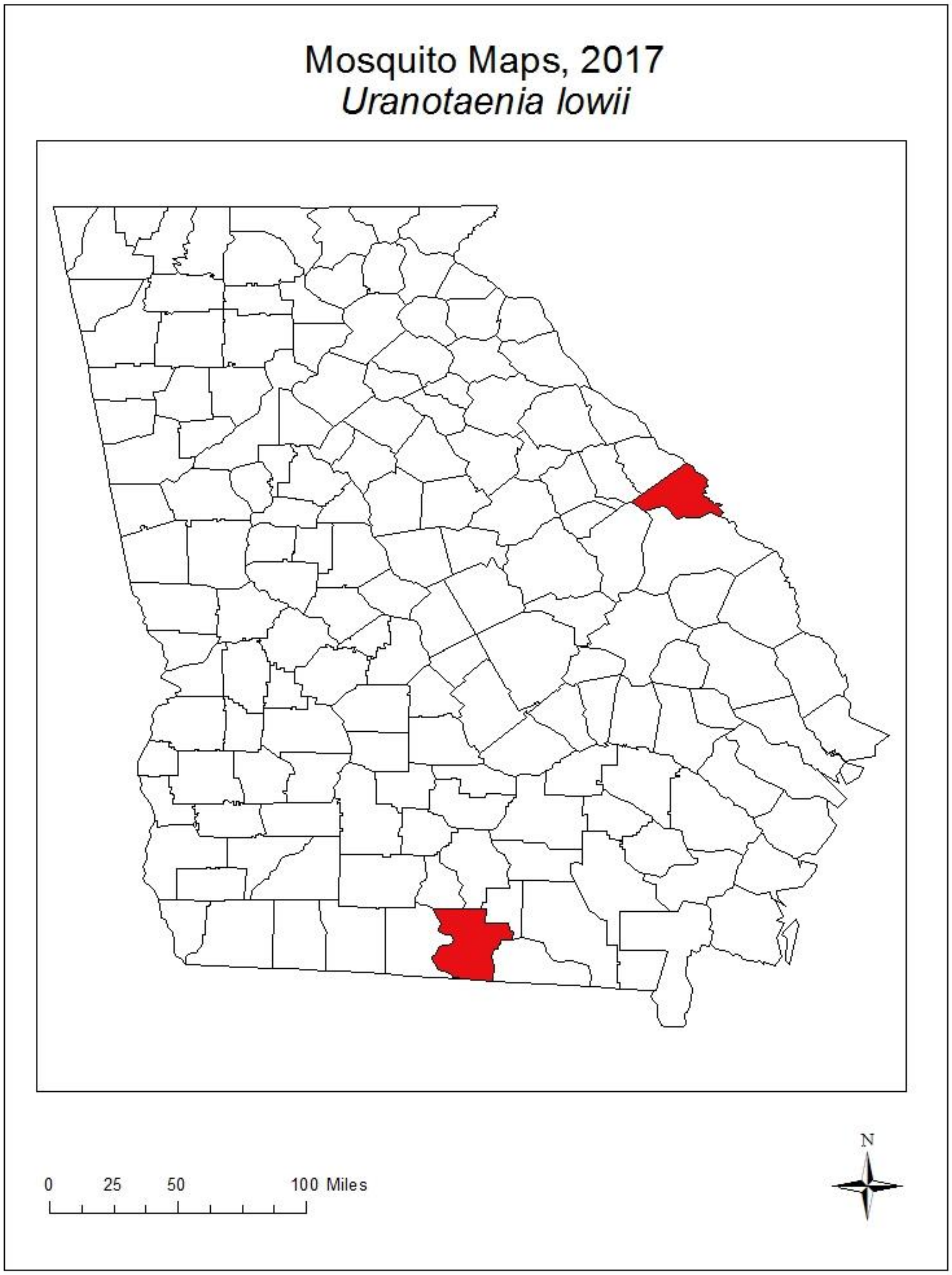



Mosquito Maps, 2017
Psorophora mathesoni
0 25 50 100 Miles
N

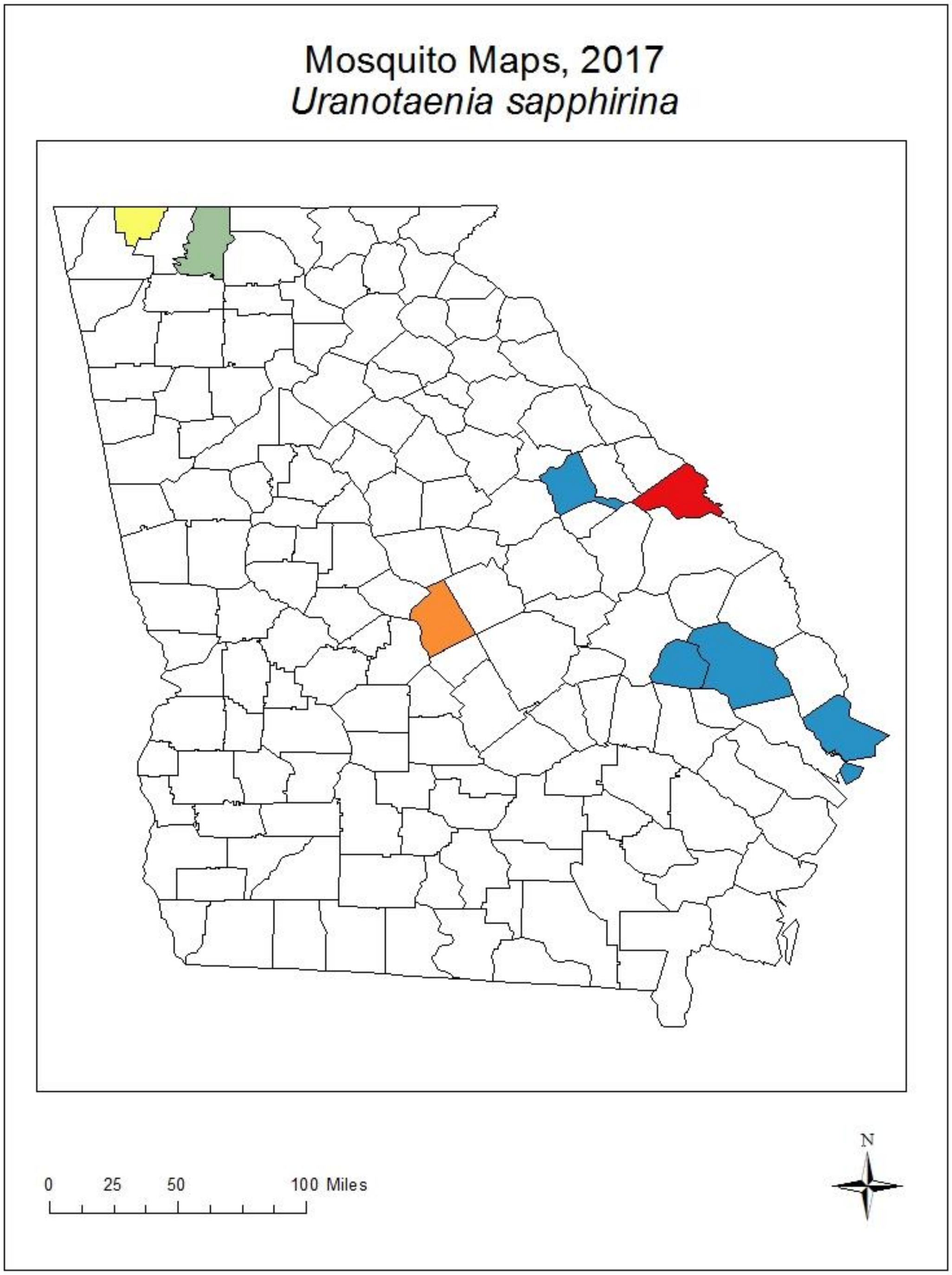
MAPS



Mosquito Maps, 2017
Toxorhynchitis rutilus
0 25 50 100 Miles
N


Mosquito Maps, 2017
Uranotaenia lowii
0 25 50 100 Miles
N

MAPS



Mosquito Maps, 2017
Uranotaenia sapphirina
0 25 50 100 Miles
N

RESOURCES

Resources

https://mosquito.site-ym.com/page/control

https://c.ymcdn.com/sites/mosquito.site-ym.com/resource/resmgr/docs/Resource_Center/Mosq_Control_Facts/Best_Practices_Mgmt/amca_guidelines_final_pdf.pdf

http://www.gamosquito.org/publications.htm

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