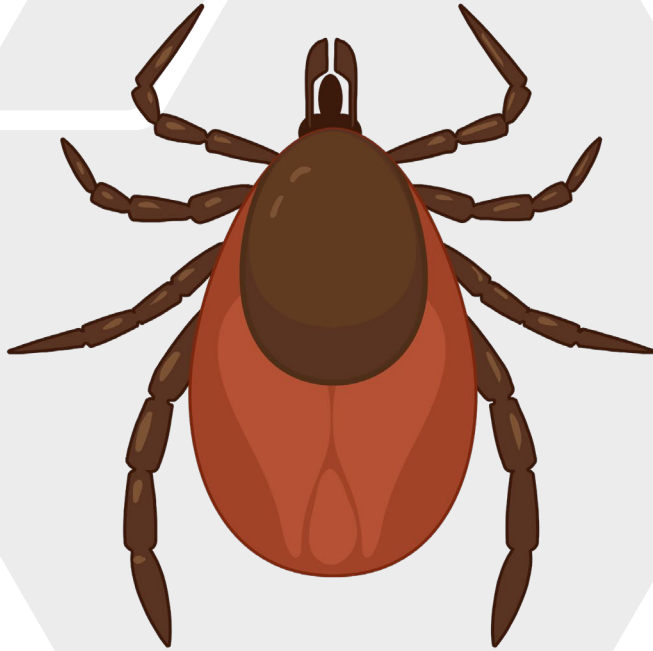




CDC Southeastern Center of Excellence in Vector Borne Diseases The Gateway Program

CDC Lunch & Learn Series

May 1, 2020



**CDC Southeastern
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The Gateway Program

TICK TALK

“Ticks Don’t Social Distance”



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Topics Covered

1) CDC SE CoE VBD Origin Story & Mission

2) Tick Surveillance

-active (dragging) vs. passive (CO2 trap)

3) Protect Yourself Before You Infect Yourself

4) State Research Projects and Student Activities

-Florida

-Kentucky

-Tennessee

-South Carolina

-Virginia

-Alabama



Tick Workshop @ US National Tick Collection,
Georgia Southern University



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Origin Story & Mission

MISSION &
GOALS



Applied Research



Responsive Training



Community of Practice



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Origin Story & Mission



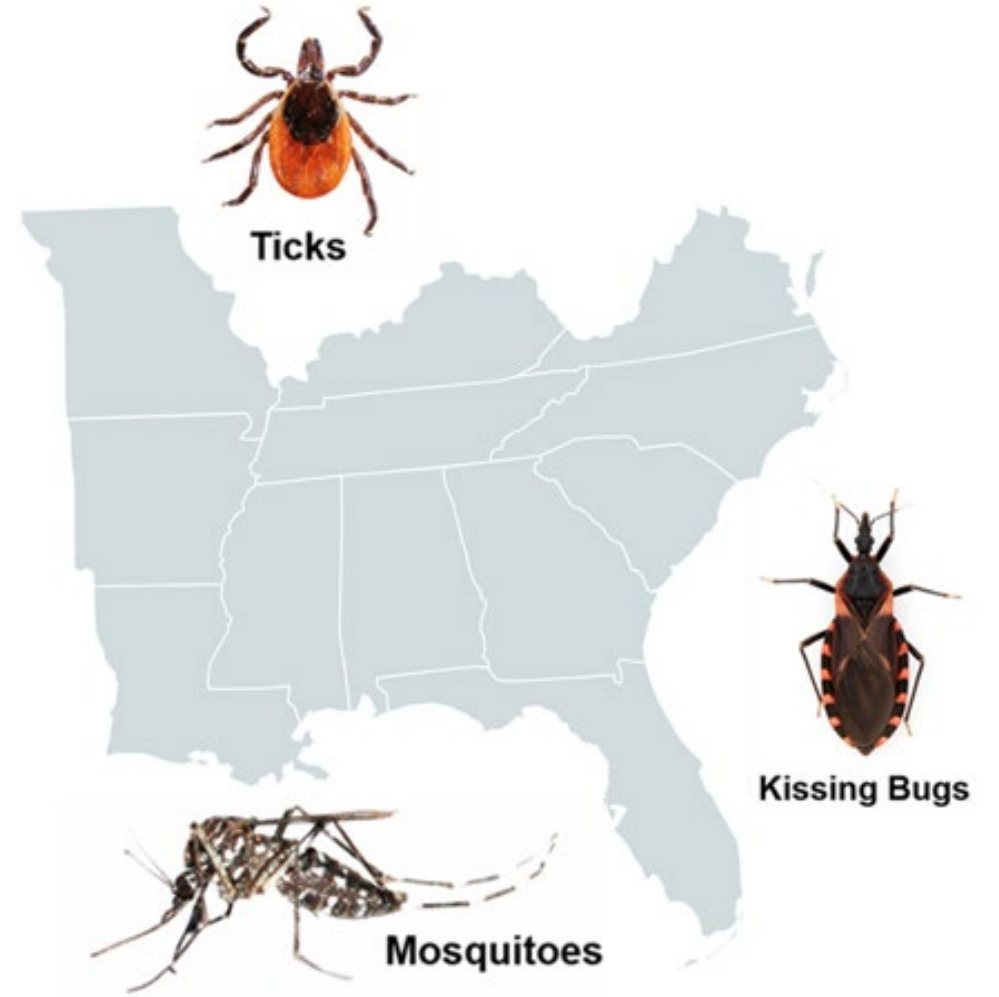
DEPARTMENTS OF HEALTH
AND PUBLIC HEALTH



MOSQUITO & VECTOR
CONTROL AGENCIES



ACADEMIC INSTITUTIONS





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Tick Surveillance 101



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Why collect ticks?



How do you collect ticks?

Different strategies for different tick behaviors





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What are the most important ticks in our area?

Lone Star Tick



Black-legged Tick



American Dog Tick



Ixodes affinis



Brown Dog Tick



Gulf Coast Tick





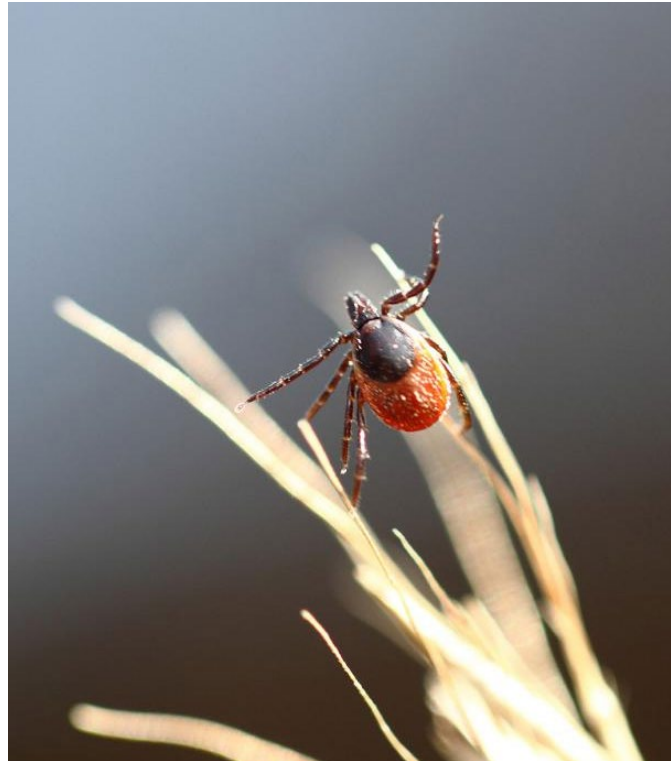
Where do ticks live?





What's dragging?

- Questing is when a tick waits for a passerby
- Outstretched legs while holding on to leaf or grass pane





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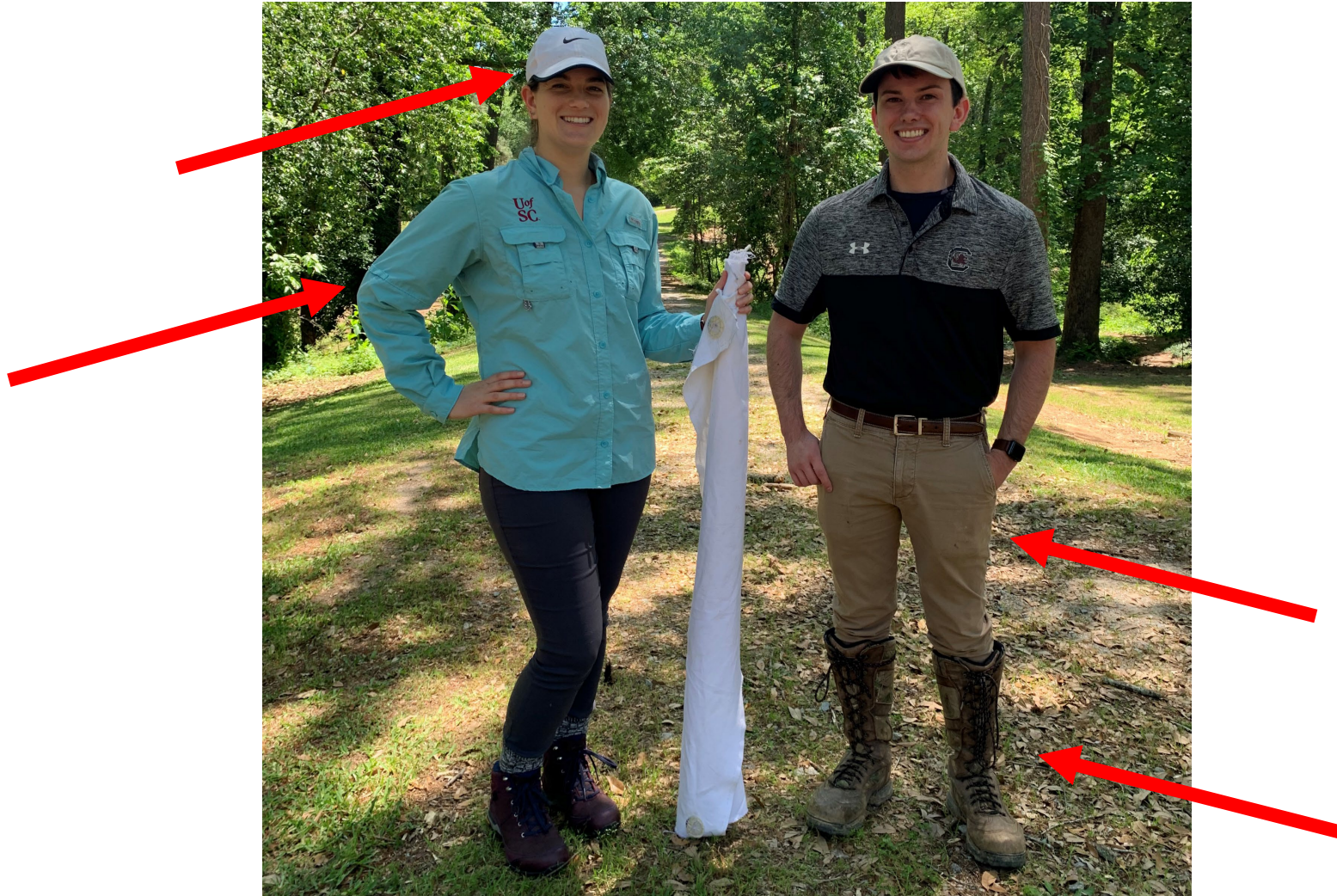
What Materials Do You Need?





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What Should I Wear?





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Let's go
dragging!





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Let's go dragging!





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Safety moment

Watch out for snakes
and poison ivy!





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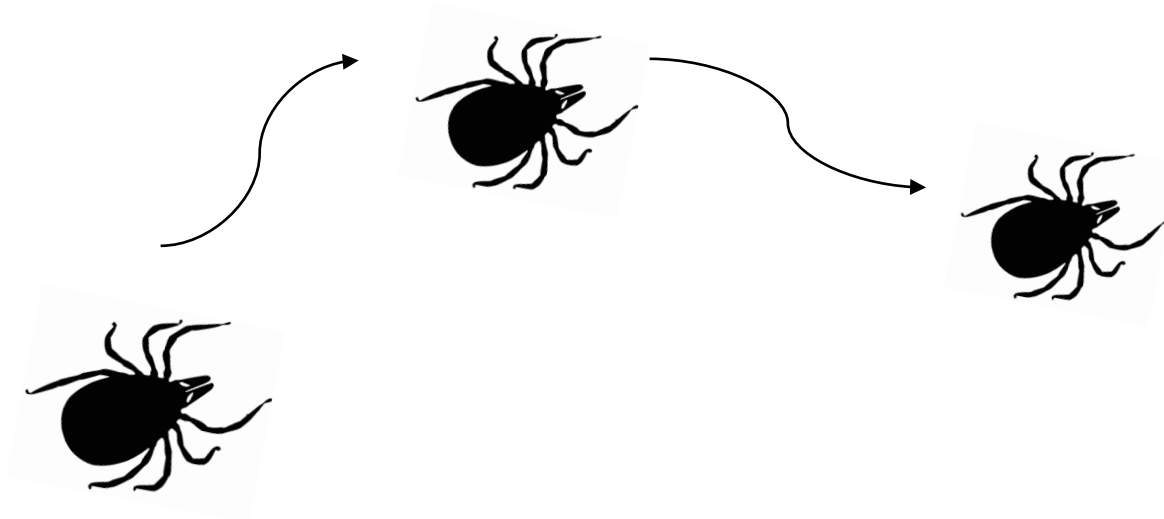
Let's go Dragging!





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What's CO₂ Trapping?





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What Materials Do You Need?





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Setting Up a CO₂ Trap





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Now we wait...



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Picking Up a CO₂ Trap





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Check Yourself Before You Infect Yourself

- Inspect your clothes
- Change your shoes and socks
- Use hot water and high heat to clean clothes
- Take a shower as soon as possible



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Tick Prevention

MYTH: Ticks fall from trees.

FACT: Ticks quest on vegetation and will crawl upwards.

Tuck pant legs into socks/boots, if possible.

During “larval season,” our field crew wraps duct tape around tops of boots.





Tick Prevention

- MYTH: All ticks wash off in the shower.
- FACT: Attached ticks do NOT wash off in the shower!
 - That's what friends are for.
 - Check entire body whenever you've been in a tick habitat.
 - Remove attached ticks immediately!





Tick Prevention

- Treat clothes with permethrin
 - Repellant
 - Tick neurotoxin
 - More effective than DEET
 - Purchase at sporting goods store
 - Be careful!
- Send clothes to be treated
 - InsectShield.com
 - 8-10 items=~\$90 w/shipping
 - Lasts several washes (70)
- Best protection:
 - •Permethrin on clothes
 - •DEET on skin





Tick Removal

1. Pointy tweezers work best (ticks are small)
2. Disinfect skin with rubbing alcohol
3. Place tweezers close to skin and firmly pull straight up
4. Disinfect skin again
5. Save the tick!
6. A ziploc bag in the freezer, labeled with the date, name and site





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We Have Ticks, Now What?

- Identify tick species
- Test for pathogens and insecticide resistance
- Disseminate knowledge to clinical, veterinary and scientific communities
- Leverage baseline surveillance for additional investigations



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Florida

Ticks in Florida





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**Ticks collected
from the field!**

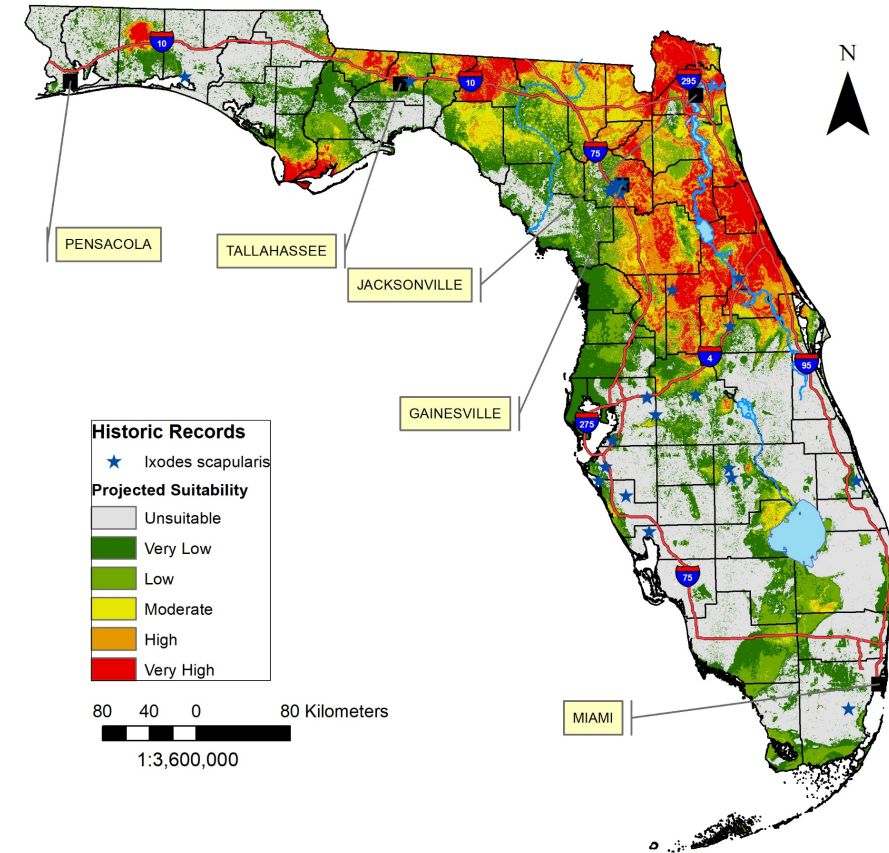
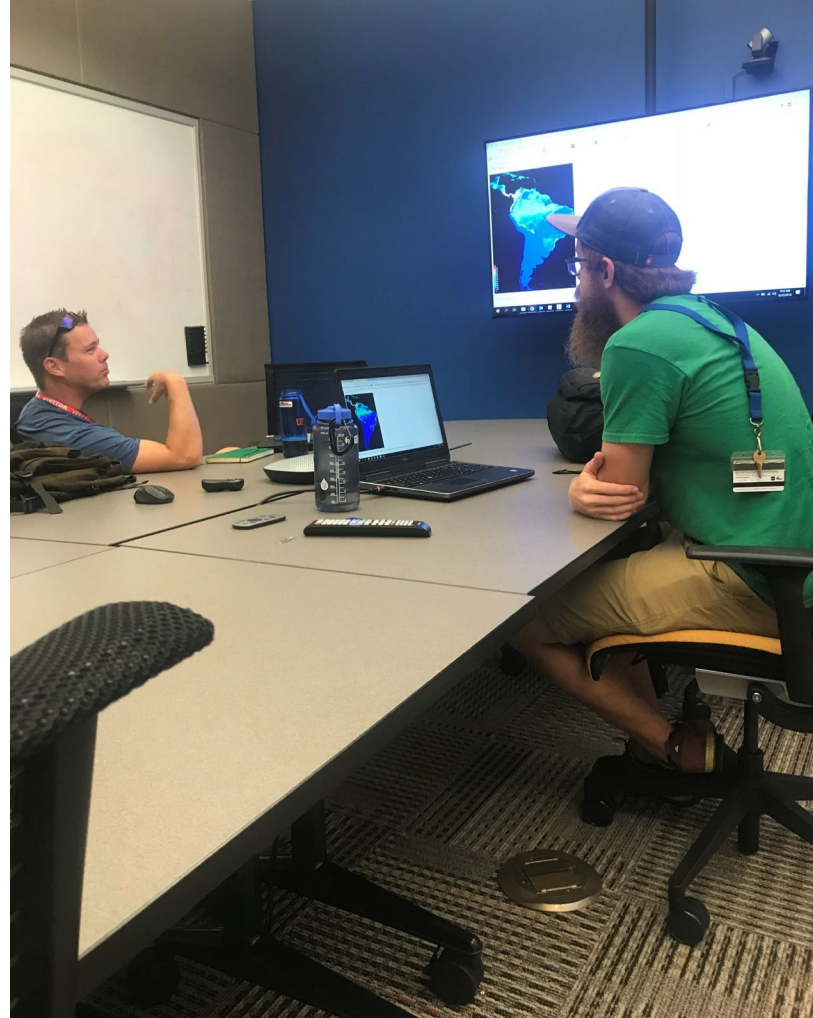




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Florida

The Product: Where to be Especially Careful





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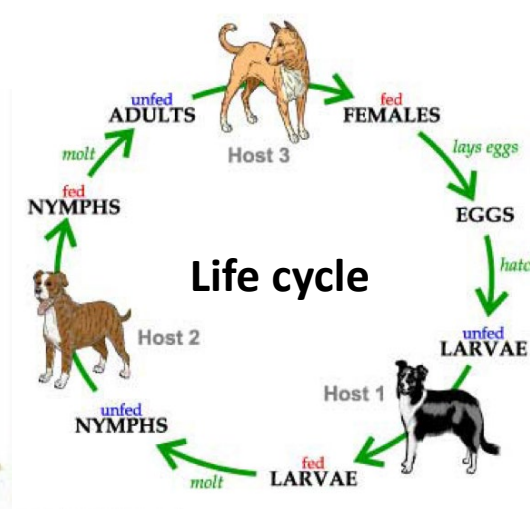
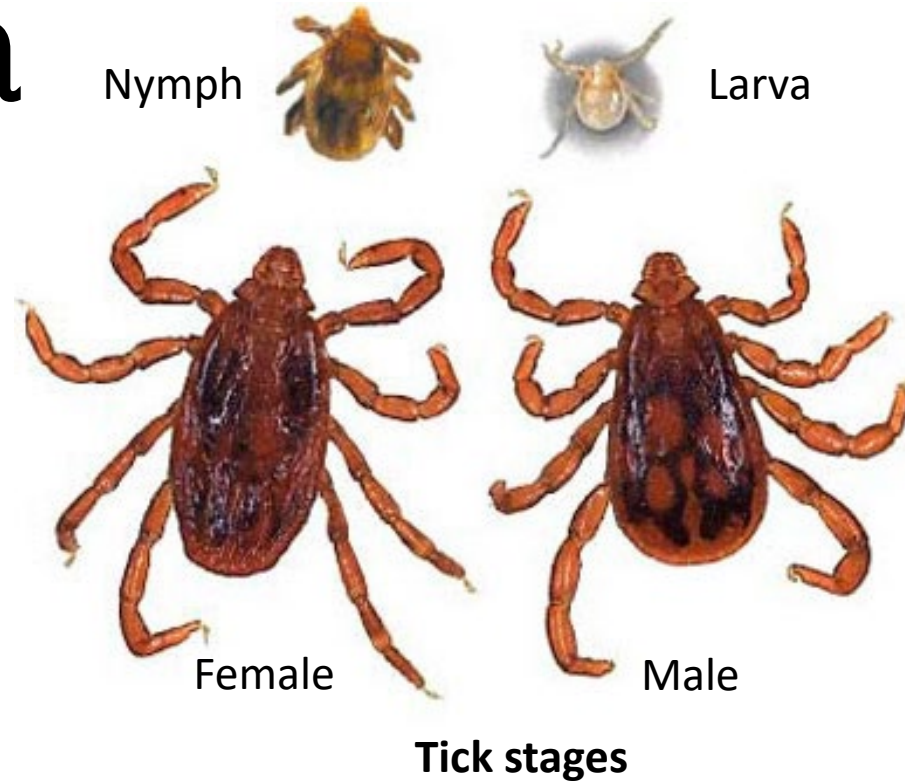
Florida

Yuexun Tian, PhD Student Univ. of Florida
(Lord/Kaufman Laboratories)

Brown dog tick

Rhipicephalus sanguineus

- Worldwide distribution
- Ectoparasite primarily of dogs
- Establish residential populations
- Pathogen vector of dogs and humans
- Resistant to multiple acaricides
- Our goal: understanding environmental effects on brown dog tick residential infestations

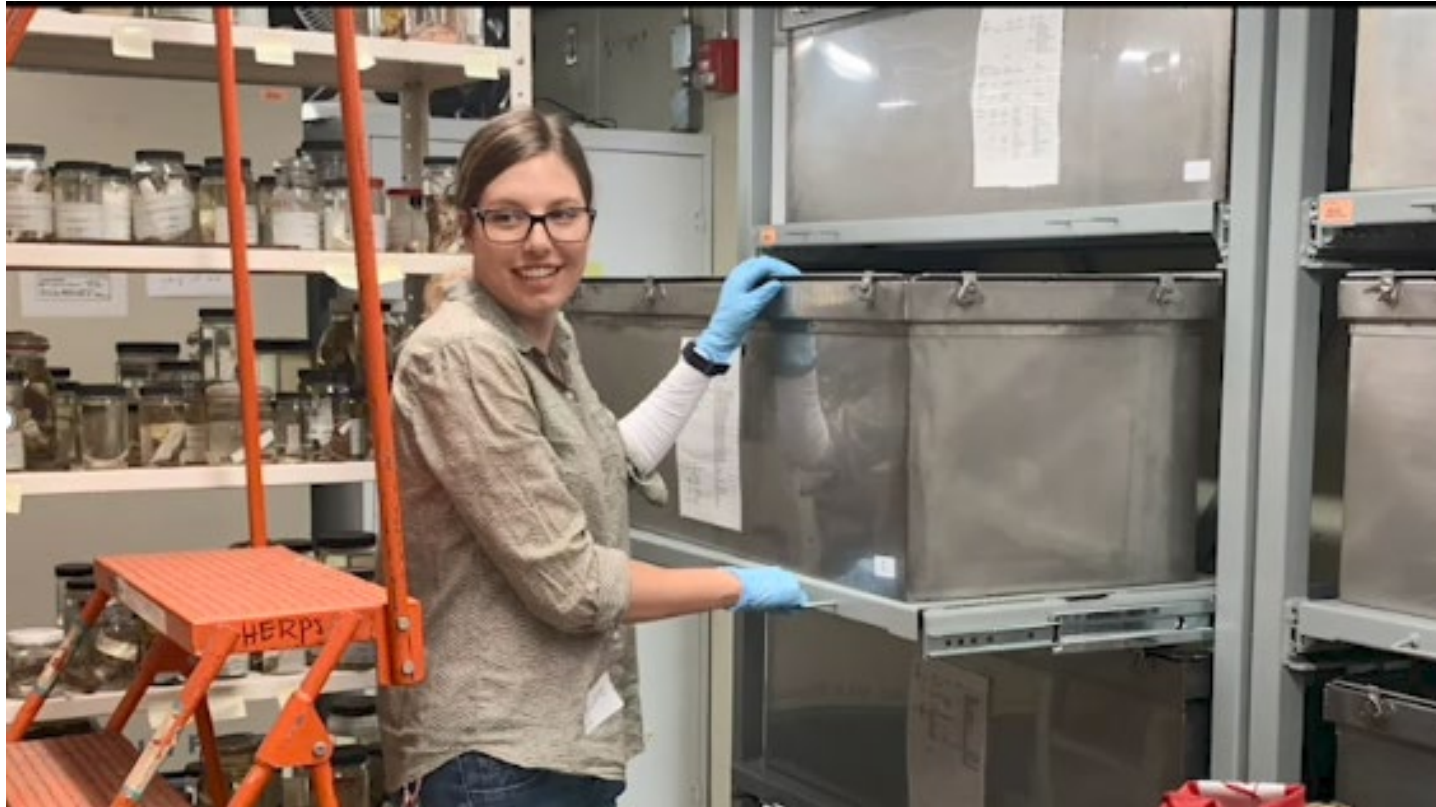




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Florida

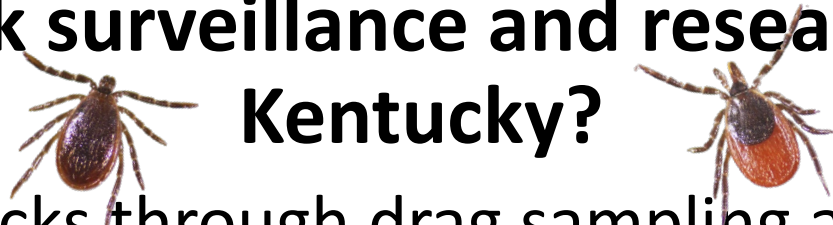
Carrie De Jesus, PhD Student University of Florida (Wisely Laboratory)





Kentucky

What does tick surveillance and research look like in Kentucky?



1. Collecting ticks through drag sampling and submissions from veterinarians, county agents, and health departments.
2. Testing ticks for pathogens that cause tick-borne diseases like Lyme Disease, Spotted Fever Rickettsiosis, and more.
3. Keeping track of what tick species and infected ticks live in what counties.



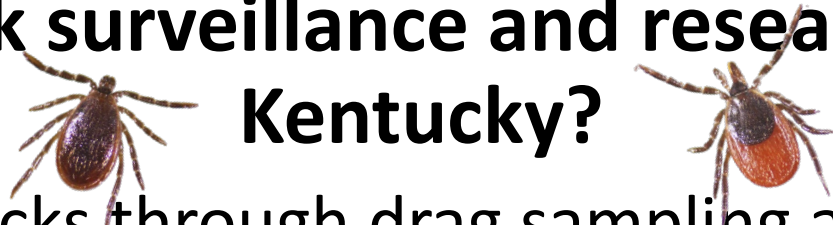
Anna Pasternak
Graduate Research Assistant
University of Kentucky





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Anna Pasternak
Graduate Research Assistant
University of Kentucky





Kentucky



Why do tick surveillance?

1. Surveillance is important for control and management of vectors & disease.
2. Understanding how ticks & tick-borne diseases can impact people and animals in Kentucky helps us better protect and treat them from such diseases.



Anna Pasternak
Graduate Research Assistant
University of Kentucky

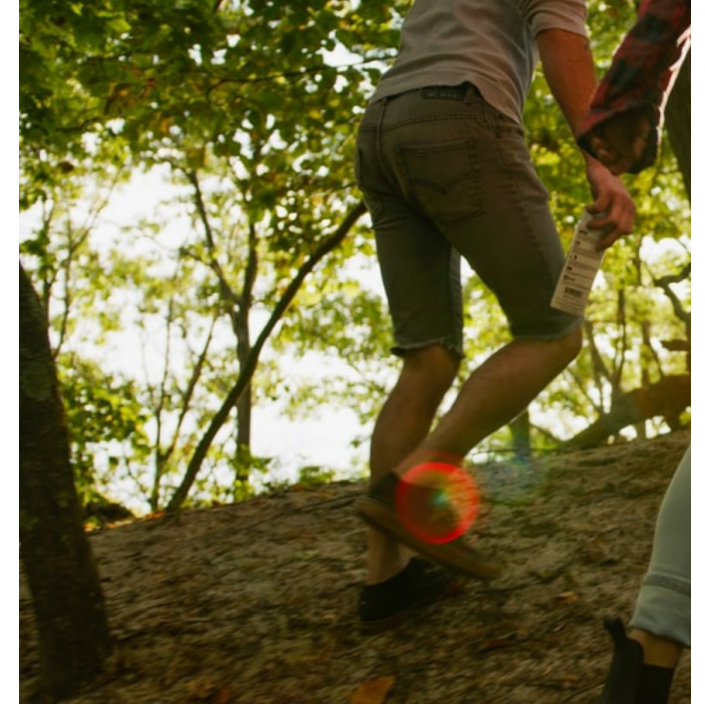




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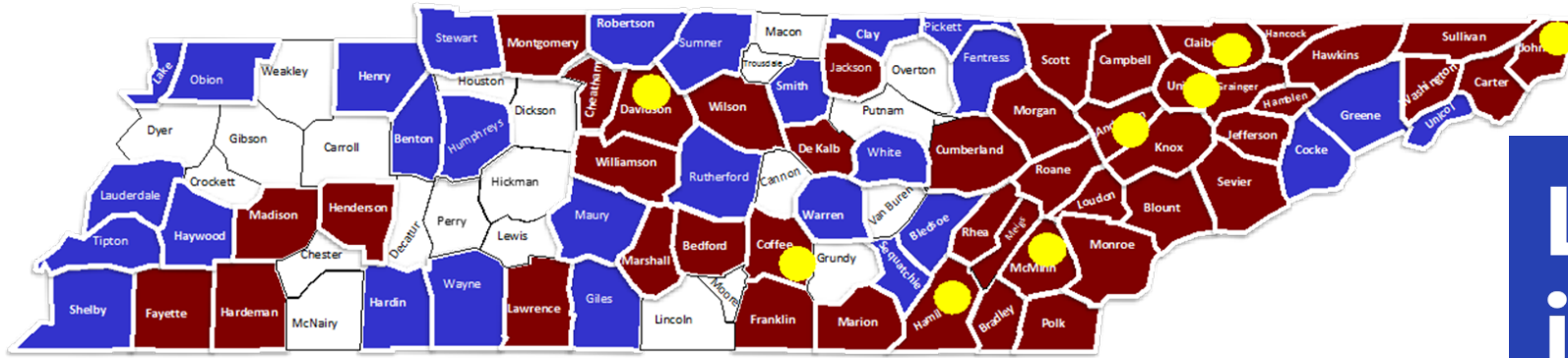
Tennessee

- Statewide surveillance of ticks and pathogens
- Sharing findings with policymakers and the general public
- Building the community of public health entomologists through trainings at professional and academic levels





Tennessee



Lyme Disease in Tennessee

Reported
Counties

Established
Counties

Counties with Lyme
infected *Ixodes*

Counties with reported and established *Ixodes scapularis* populations and locations where *Borrelia burgdorferi* sensus stricto has been identified from unfed adult ticks.



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Tennessee

Public Health Entomologist



Vector-Borne
Disease Surveillance



Mosquito Control Districts | Pest Management Industry | Academia
Citizen Science | Environmental Groups | Wildlife & Agricultural
Agencies | Professional Organizations

Vector
Control



Insecticide
Resistance



Research &
Training



Centers of Excellence in
Vector-Borne Diseases
Academia

Communication &
Coordination



Health Departments
Legislature | Physicians
Media | K-12

CDC

Protecting Public Health

Informing
Policymakers



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South Carolina



- Establishing a student cadre of tick researchers and public health practitioners
- Statewide surveillance
 - 4 regional managers, collecting in state parks
 - March to October
- Informing Policymakers
- Invasive veterinary species
 - Residential veterinarians, humane societies, and animal shelters
 - Dairy cow farms





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Virginia



- Community outreach and engagement
- Statewide surveillance by county
 - Range expansion tracking
- Mathematical modeling and computer simulation of tick-borne diseases





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Alabama



Skyler Kerr – Master's Student

Dr. John McCreadie – Entomology Professor

Dr. Jonathan Rayner – Microbiology Lead

Dr. Ryan Wood – Molecular Lead

Project Background and Methods

- Funding provided by Alabama Study Commission on Tick Borne Illness
- Determine true presence of tick species and tick-borne disease throughout the state of Alabama
- From 2018-2020 statewide collections are taken through CO₂ trapping, host removal, and flagging techniques
- Specimens identified to species then sorted by age and sex
- Specimens undergo nucleic acid extractions and qt-PCR to find pathogen



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South Carolina

UF | UNIVERSITY of
FLORIDA



OLD DOMINION
UNIVERSITY

UK University of
Kentucky



UNIVERSITY OF
SOUTH ALABAMA



**GEORGIA
SOUTHERN**
UNIVERSITY

Please join us for the Lyme Disease Awareness Month Lunch & Learn Series with the Vector-Borne Disease Regional Centers of Excellence

**Every Friday in May at
1pm ET / 12pm CT / 10am PT**

May 1

“Ticks Don’t Social Distance”

Southeastern Center of Excellence in Vector-Borne Diseases

May 8

“Where Ticks Live & Roam”

Northeast Regional Center for Excellence in Vector-Borne Diseases

May 15

“#NoMoreTicks: How to Protect Yourself Against Tick Bites”

Midwest Center of Excellence for Vector-Borne Disease

May 22

“The Travelling Tick: Studying Ticks Across Borders”

Western Gulf Center of Excellence for Vector-Borne Diseases

May 29

“Ticks in the Wild West”

Pacific Southwest Center of Excellence in Vector-Borne Diseases