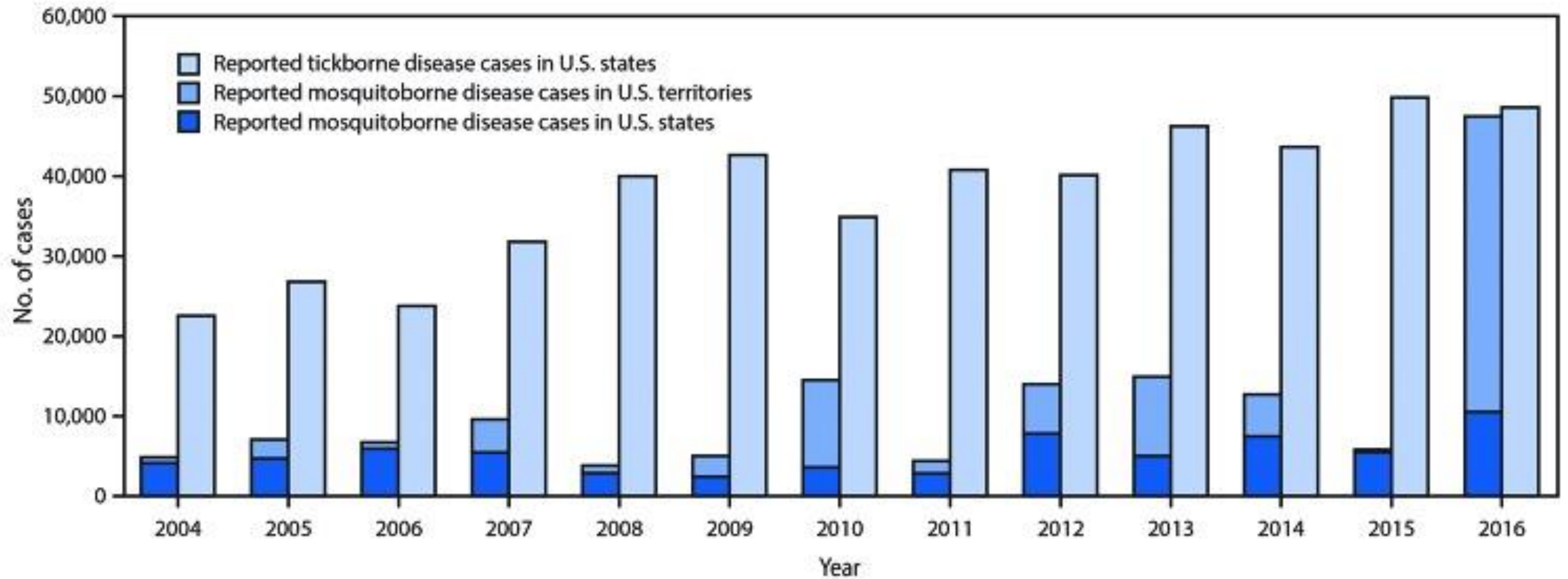


TICK-BORNE VIRUSES OF GEORGIA

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Emory University

Background on tick-borne disease



Heartland & Bourbon Virus

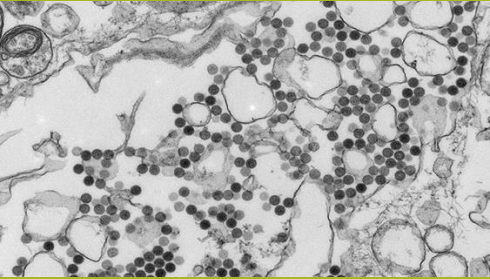
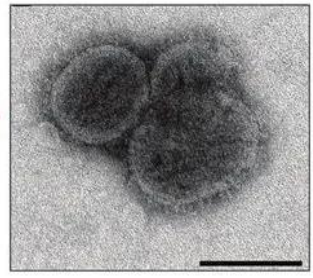
Virus	Genus	Carriers	Symptoms	Year discovered
HRTV 	<i>Bandavirus</i> (3-segmented RNA virus)	<i>A. americanum</i>	Fever, fatigue, headache, nausea, thrombocytopenia, and leukopenia	2009
BRBV 	<i>Thogotovirus</i> (6-segmented RNA virus)	<i>A. americanum</i> <i>H. longicornis</i>	Fever, fatigue, rash, body aches, nausea, vomiting, thrombocytopenia, and leukopenia	2014





Photo by Matthew Pearson
for WABE

Key Players: HRTV,
BRBV, and
A. americanum

Objectives

- Incriminate Heartland Virus reservoir (using BMA)
- Understand HRTV phylodynamics through viral surveillance
- Detect other viruses which may be present (BRBV)
 - Answer similar questions about phylodynamics, reservoirs, and ecology



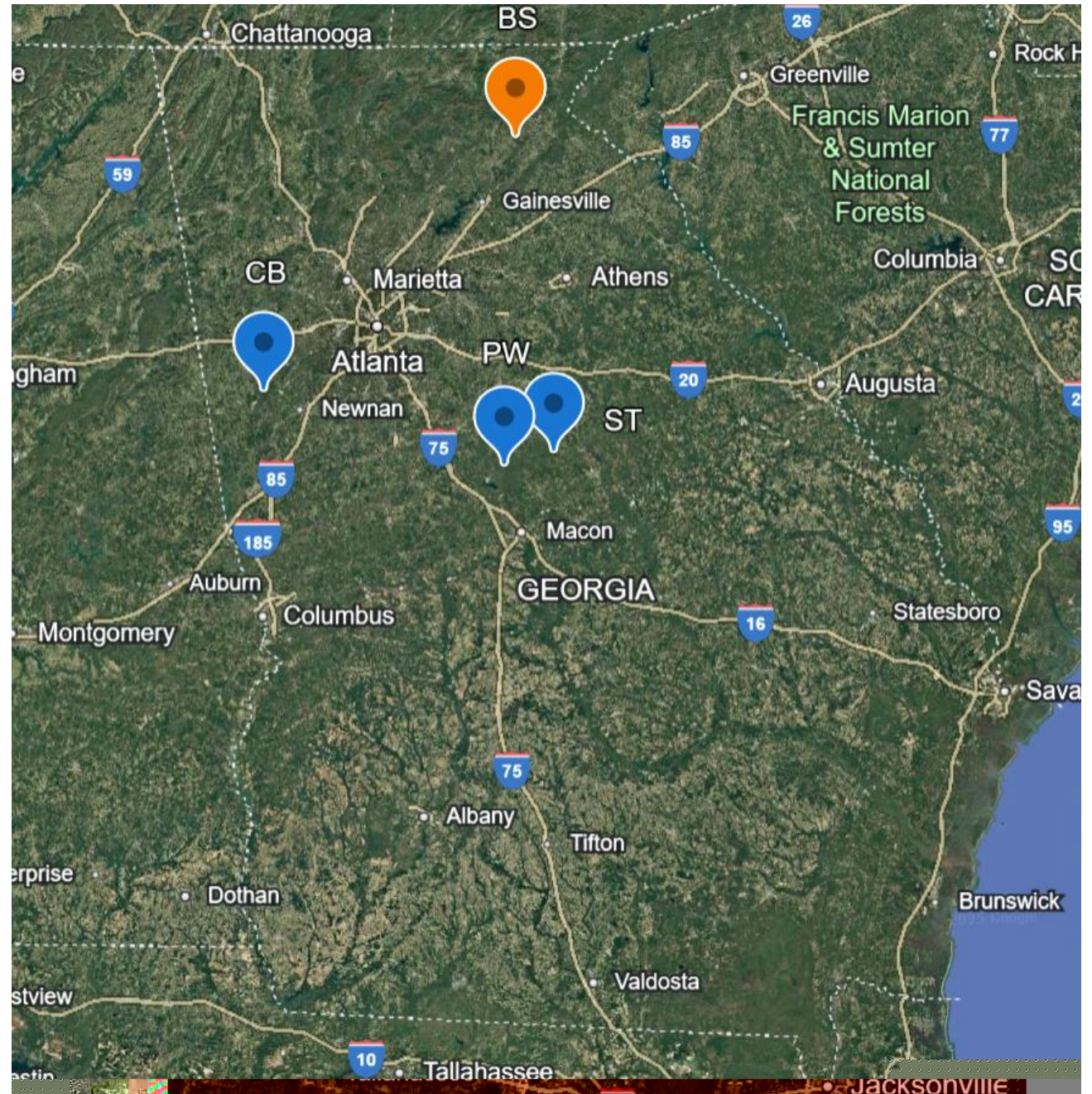
Study sites

CB - Chattahoochee Bend State Park where HRTV was found in 2023

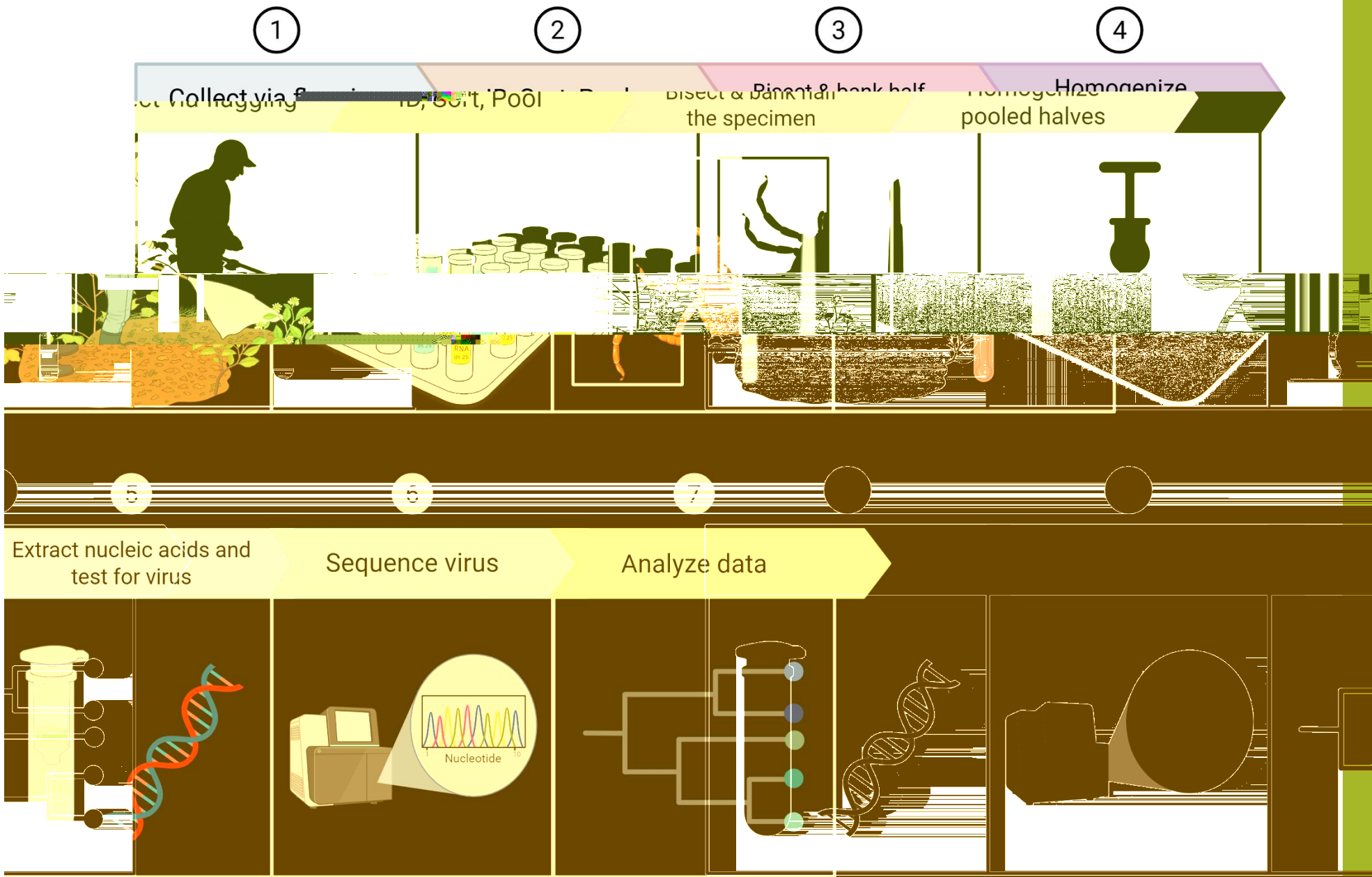
ST – a privately owned patch of woods where HRTV was first detected in 2019

PW – Piedmont National Wildlife Refuge near where positive ticks have been found and in a hot zone based on Steph's map

BS – a site chosen because of the presence of the invasive Asian Longhorn Tick



Methods



Results

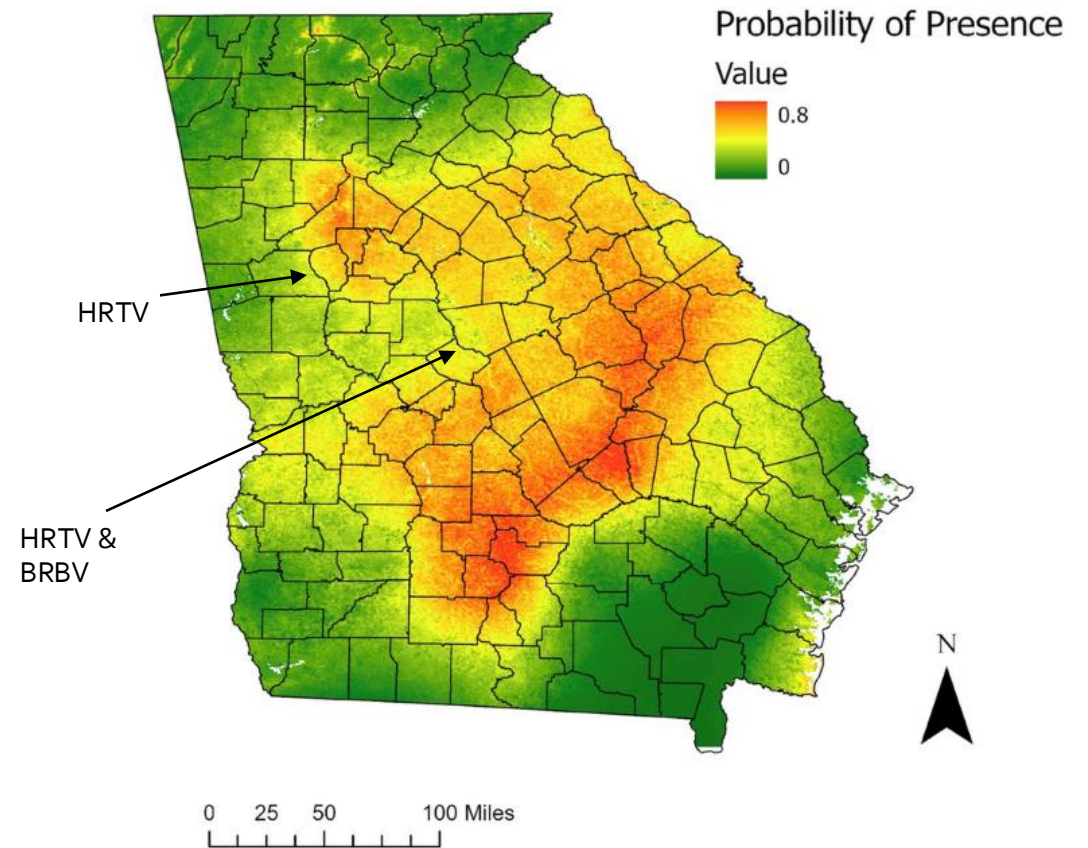
Minimum Infection Rate per 1,000 Ticks

Year	2018	2019	2021	2022	2023	2024	2025*	Totals
HRTV Positive Pools/Total specimens	0/3,002	3/7,503	1/7,687	2/3,447	5/10,211	0/3,370	1/8,007	12/40,225
HRTV MIR per 1,000 samples	0	0.4	0.13	0.58	0.49	0	0.12	0.298
BRBV Positive Pools/Total specimens	0/3,002	0/7,503	NA	NA	NA	0/3,370	3/8,007	3/18,880
BRBV MIR per 1,000 samples	0	0	NA	NA	NA	0	0.37	0.075

*Nymphs have not yet been tested for this year

Sites on *A. americanum* Presence Probability Map

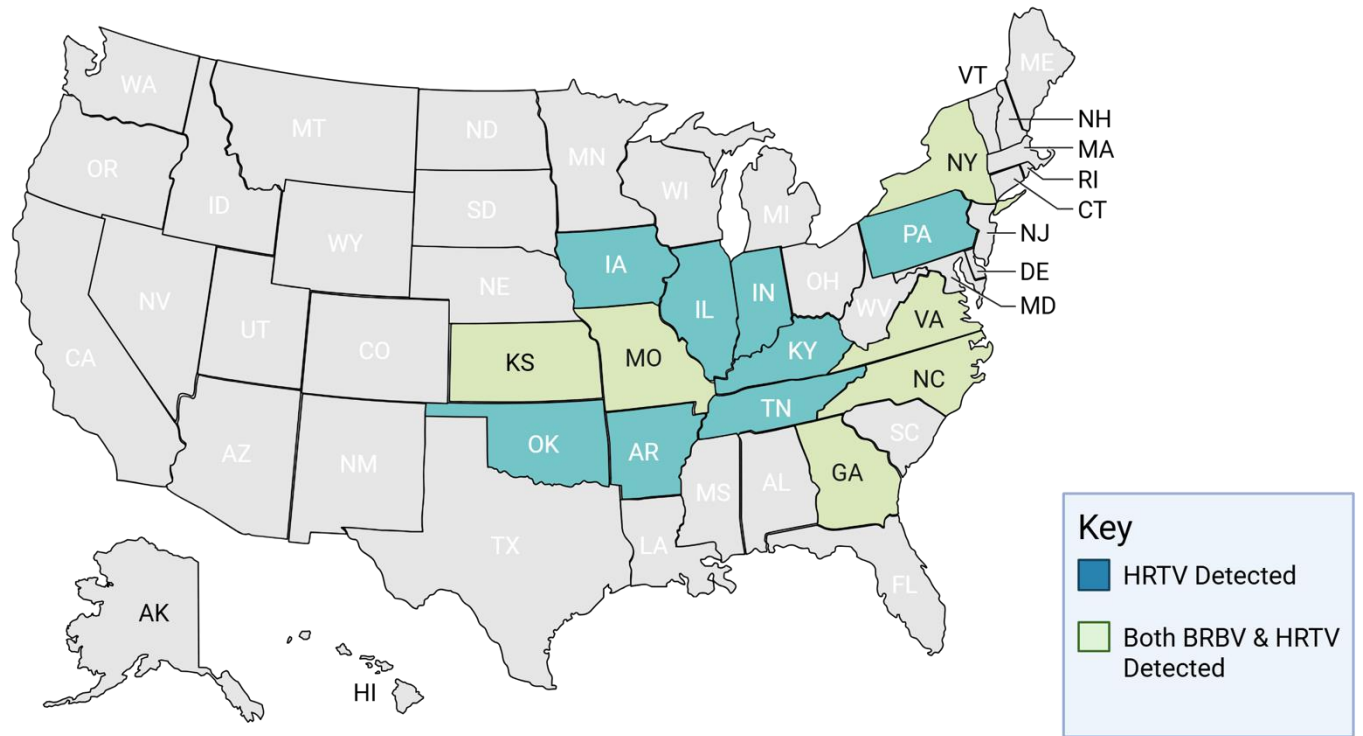
Heat map generated by S. Bellman shows predicted probability of finding AMA. Arrows indicate where viruses were found.



Significance

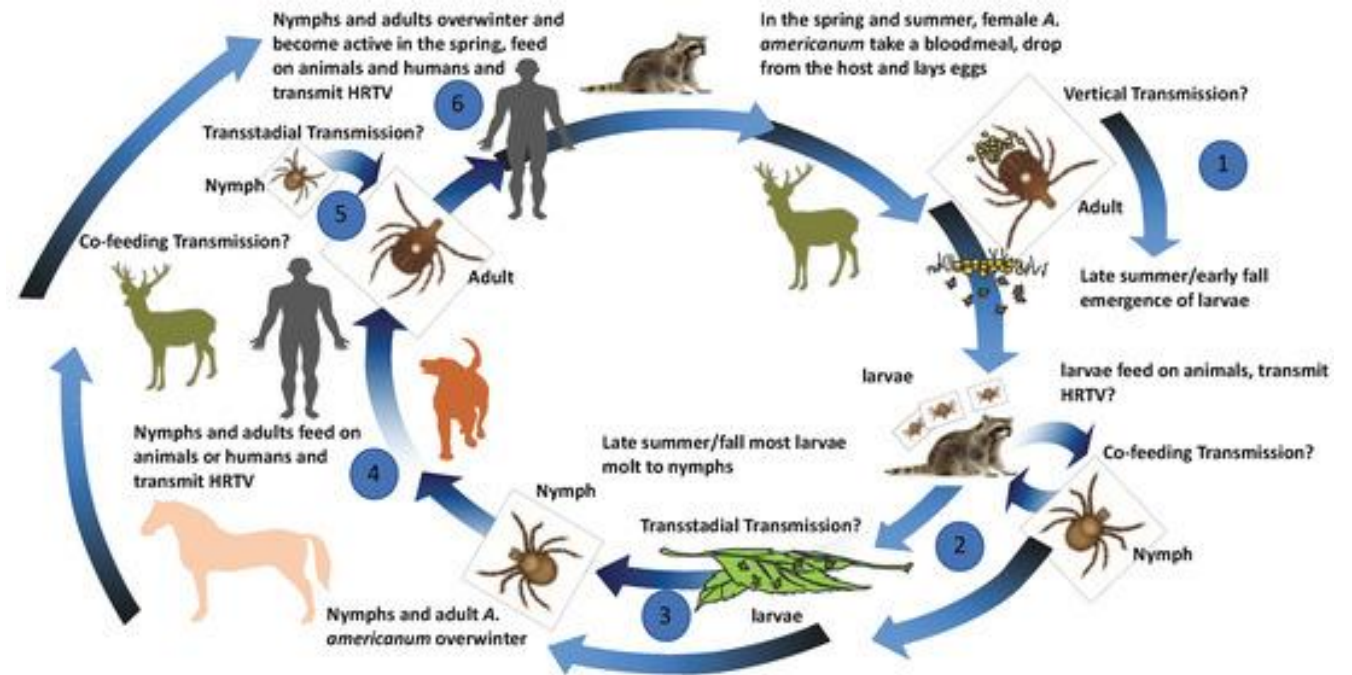
1. BRBV is in GA
2. Transovarial transmission of BRBV in nature
3. Found in same geographic area as HRTV: potential for coinfection

States reporting Heartland and Bourbon Viruses



Future Directions: Fill in the Gaps

- Blood meal Identification
 - Identify reservoirs
 - Clearer picture of what they feed on
- Phylogenetic analysis
 - How are these viruses changing as they spread?



Thank you!

Questions?



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