



A Tale of Ticks and Taq

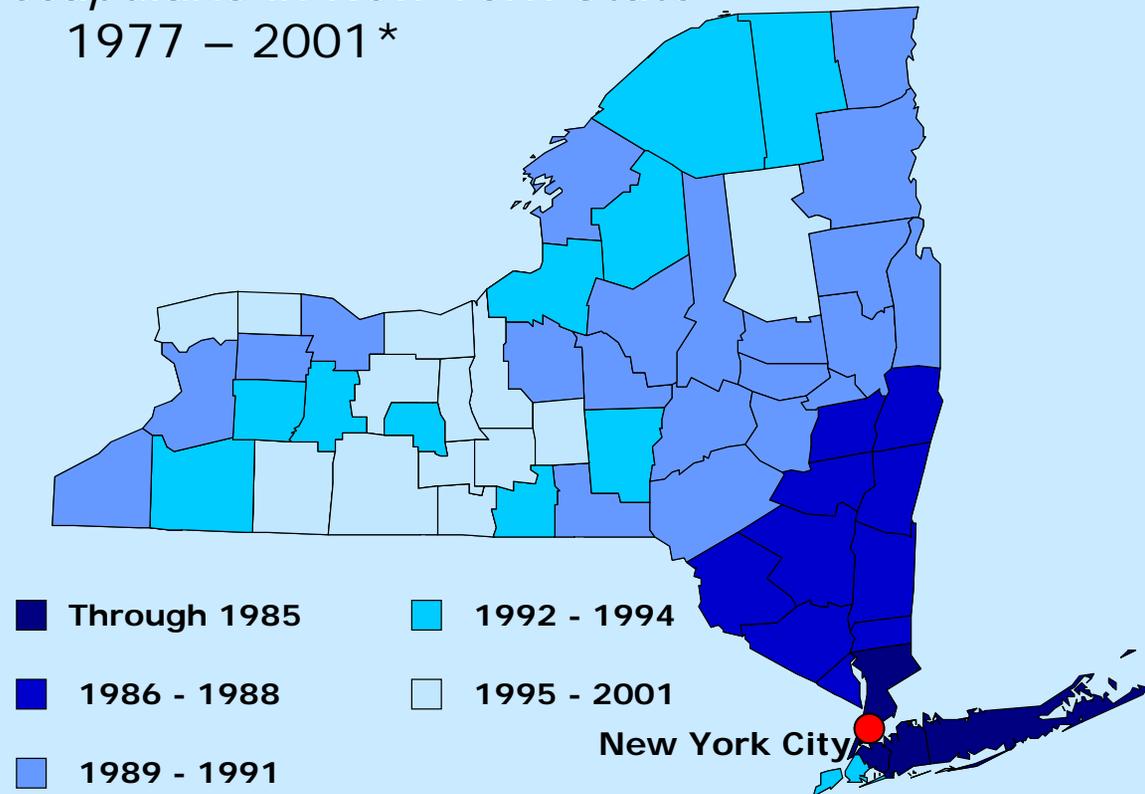
Tick-borne disease ecology research and
surveillance activities of the
New York State Department of Health



Melissa Prusinski
Research Scientist
New York State Department of Health
Arthropod-Borne Disease Program

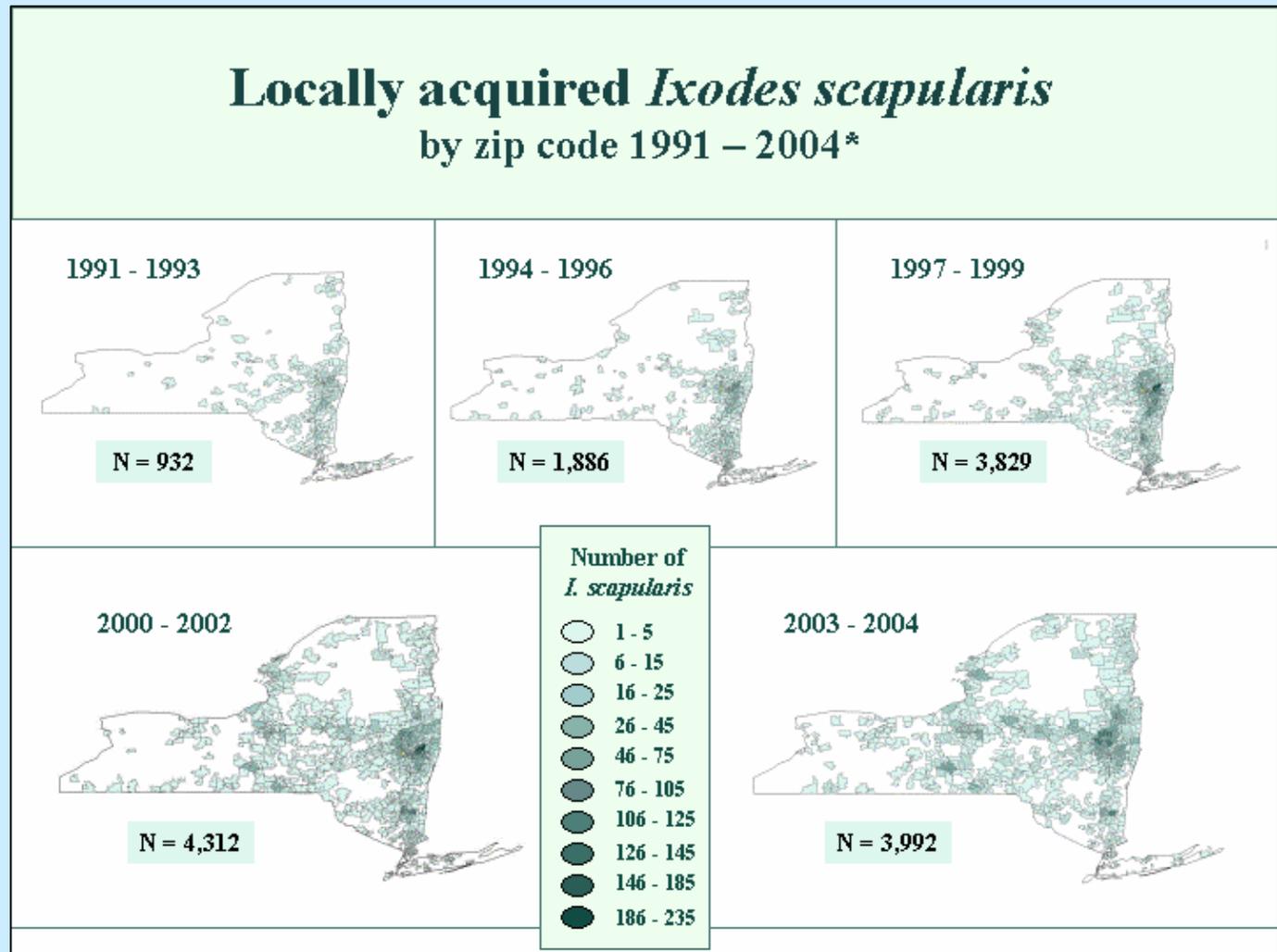
Background:

Geographic and Temporal Distribution of *Ixodes scapularis* in New York State 1977 – 2001*



*NYSM and NYSDOH passive surveillance/Tick Identification Service data

Background:



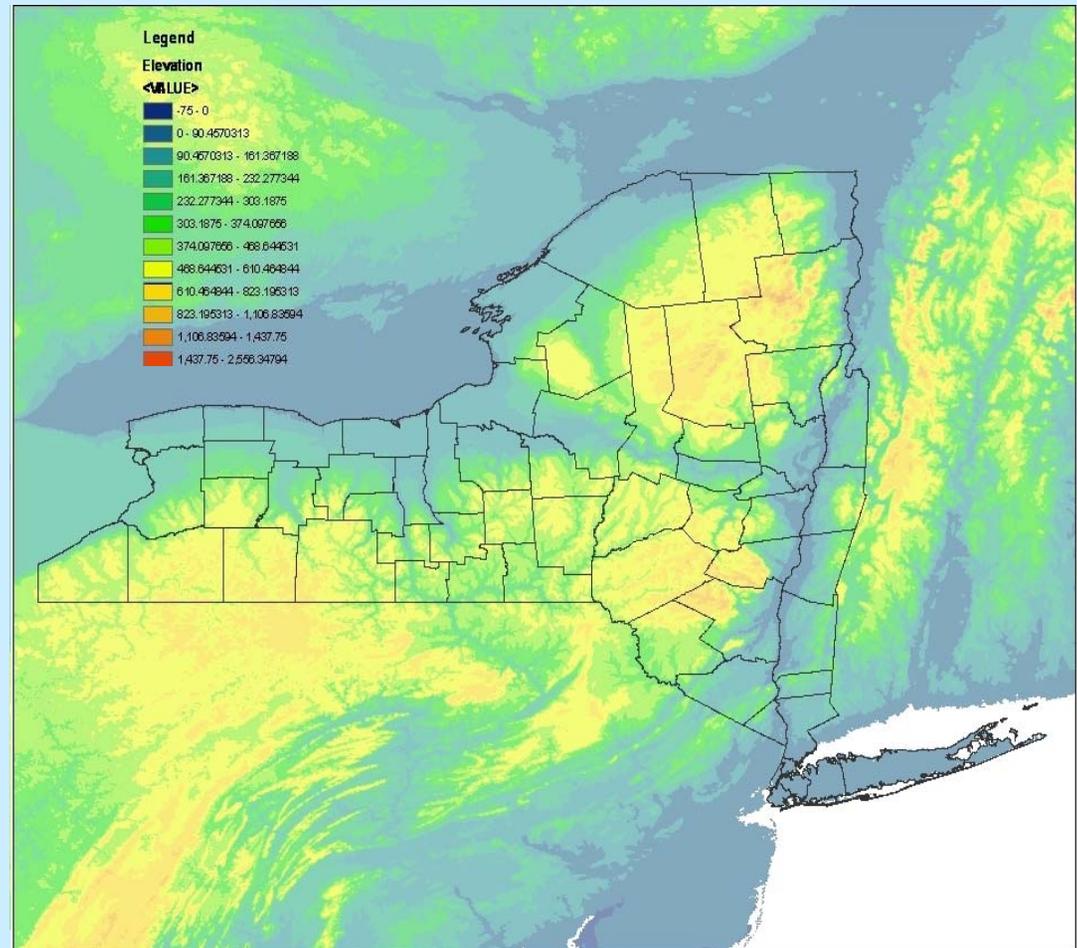
*Unpublished NYSDOH passive surveillance/Tick Identification Service data

Background:

Lyme Disease Cases Mapped by Patient Street Address and Elevation (2007)*

Lyme disease can be acquired across the state, however...

the majority of Lyme disease cases in New York State occur at elevations **below 200 m**

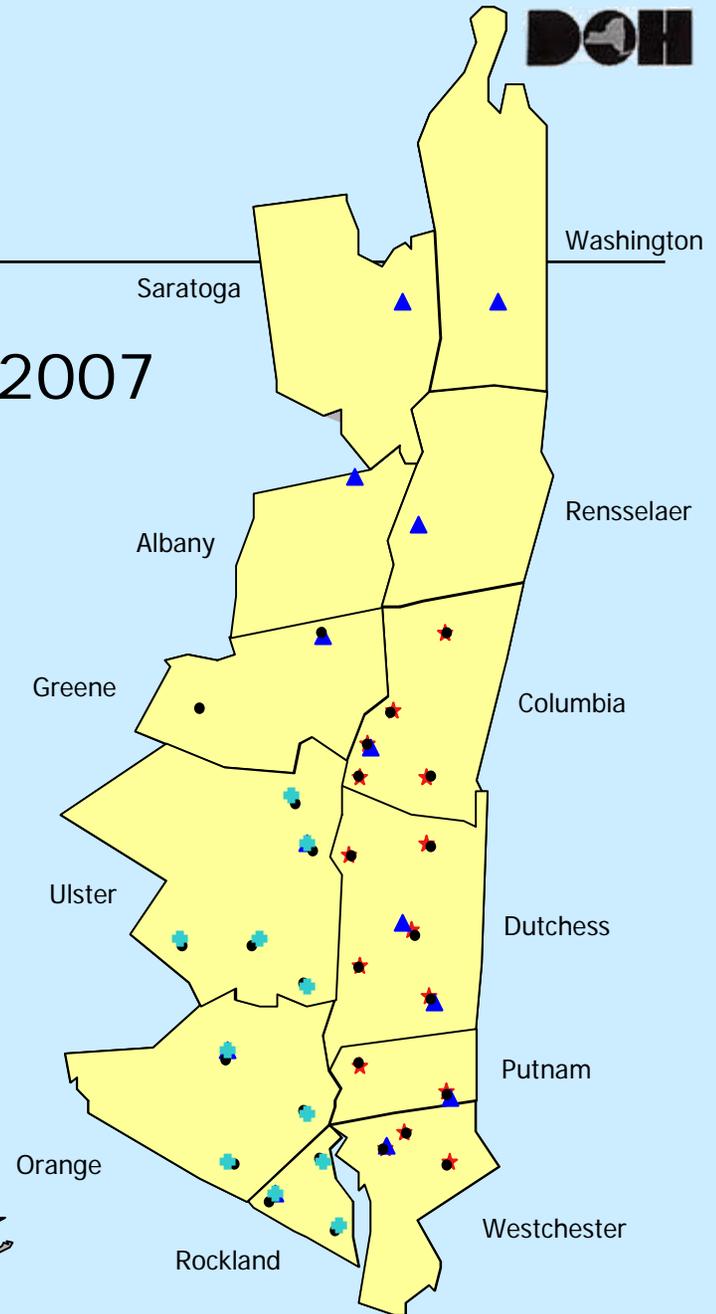
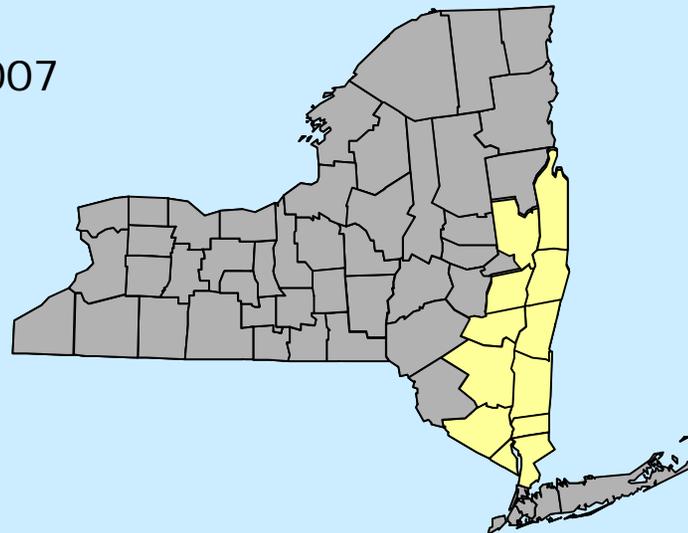


*Unpublished NYSDOH data based on physician reported cases

Tick Collections:

Tick Collection Sites 2002-2007

- ★ 2002 and 2003
- 2004 and 2006
- ⊕ 2005
- ▲ 2007



Tick Collections:

- Each site visited 2 times per year (June and October/November)
- Drag (nymphs)/flag (adults) for 1 hr at each site (Minimum 1000 m² sampled per site)
- Collect only when air temp >6°C and wind speed <10 mph
- Tick density estimates: Avg ticks/hr and ticks/m² sampled (estimated from collector's stride measurement)
- Environmental data collected
 - Air temperature
 - Relative humidity
 - Weather conditions



Collection Summary (*I. scapularis*)

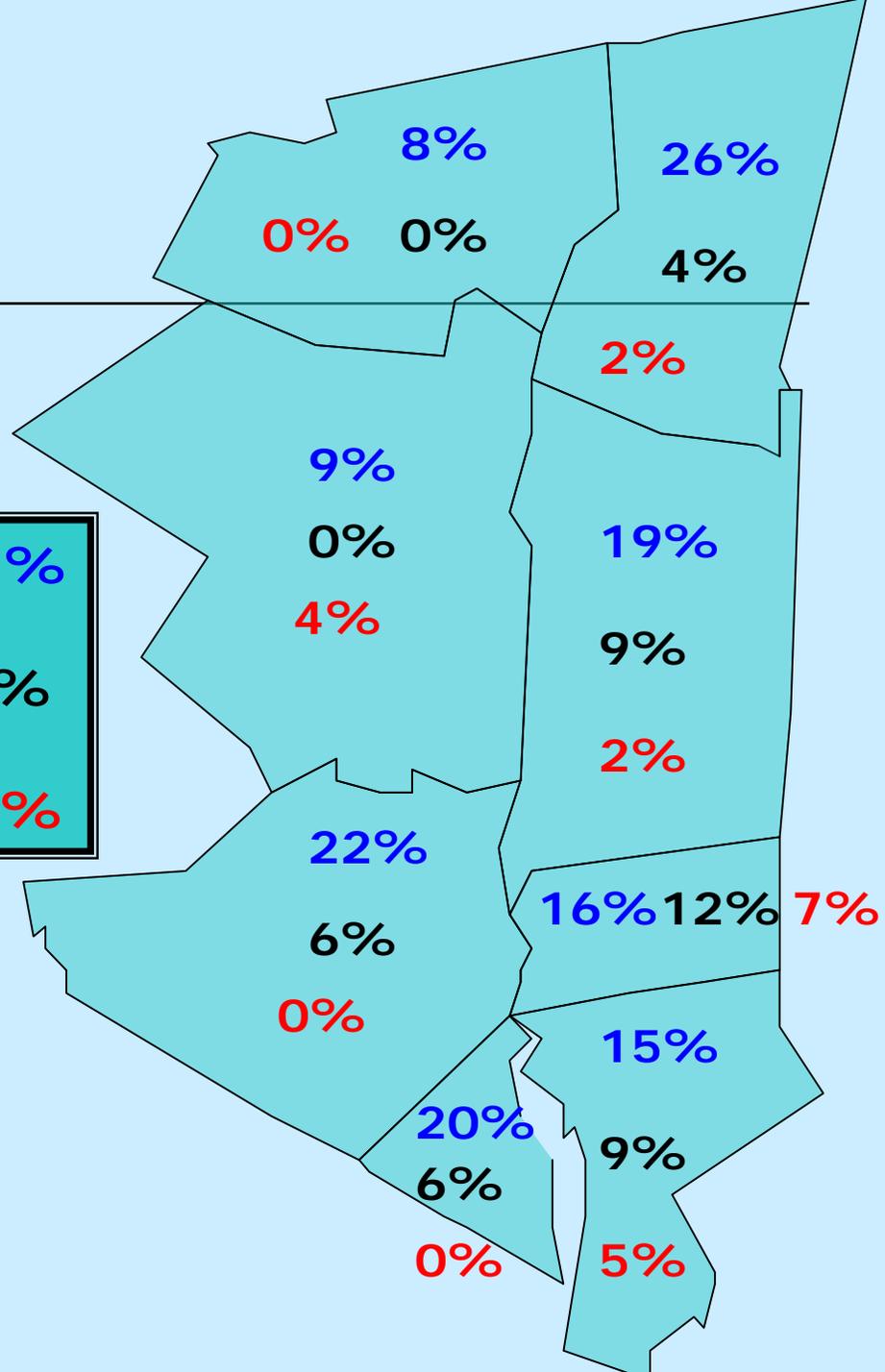
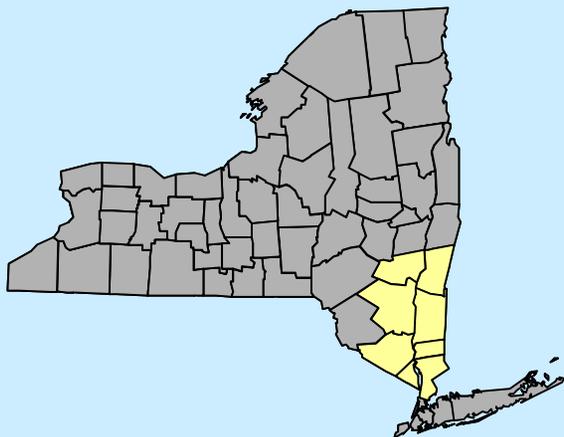
	2003		2004		2005	2006	
	N	A	N	A	A	N	A
Columbia	74	501	190	451		230	637
Dutchess	122	856	236	497		365	742
Putnam	107	393	253	185		284	352
Westchester	420	1094	303	354		393	329
Greene			13	40		32	26
Ulster			22	79	71	79	117
Orange			82	495	199	105	258
Rockland			54	302	89	159	259
TOTALS	723	2844	1150	2403	359	1647	2720

* Unpublished NYSDOH data

Results:

I. scapularis nymphs
2003 – 2006*

<i>B. burgdorferi</i>	= 14 %
<i>A. phagocytophilum</i>	= 7 %
<i>B. microti</i>	= 3 %

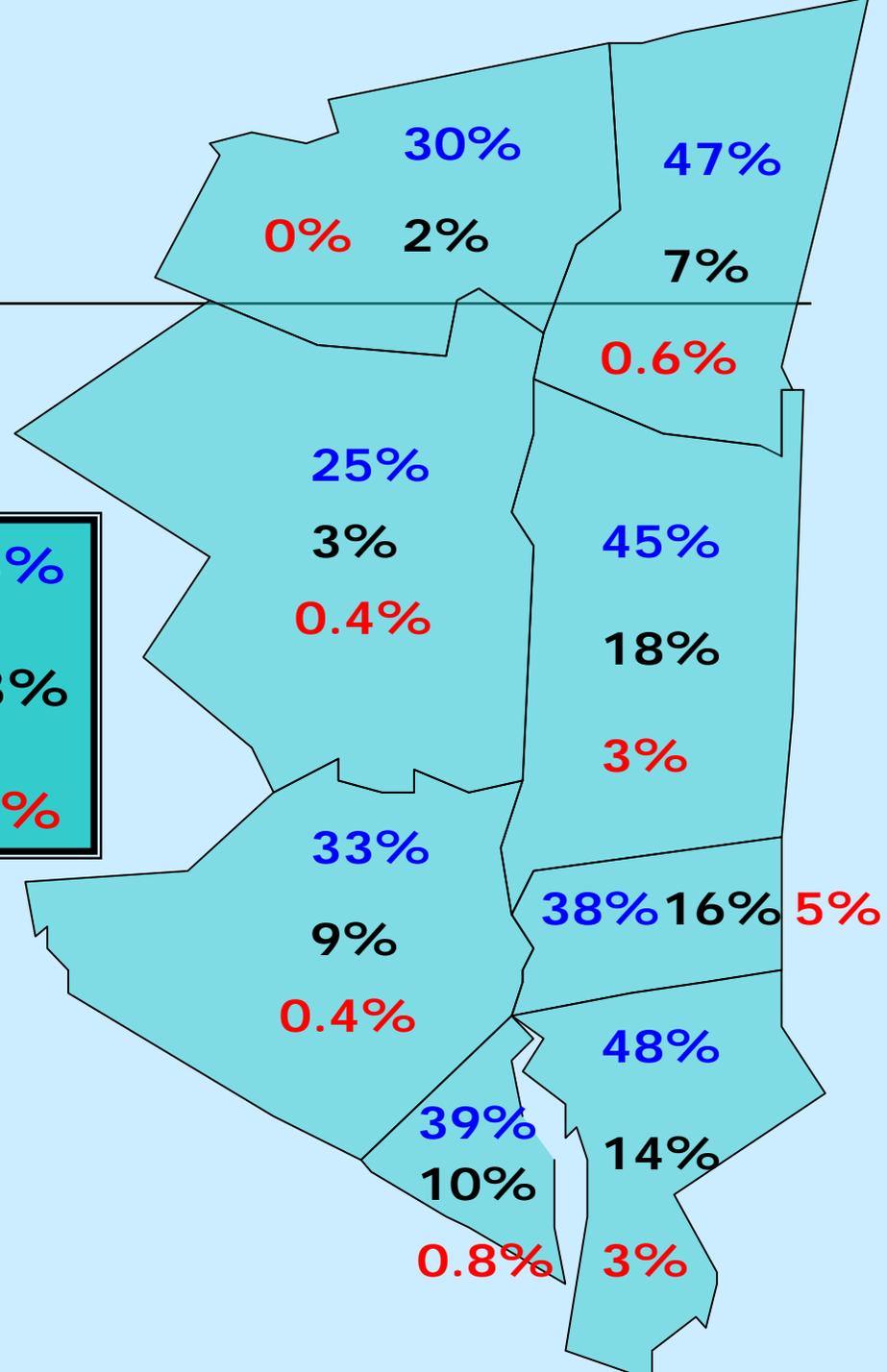
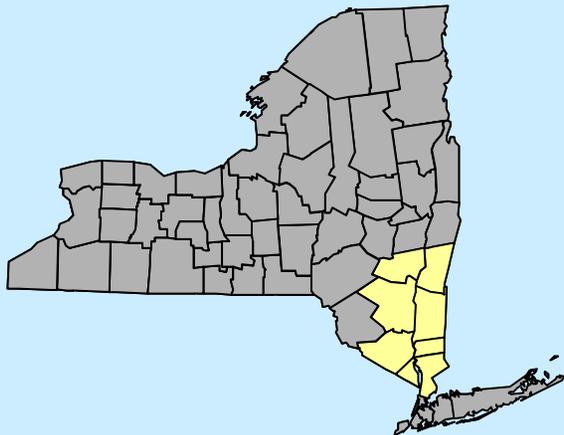


*Unpublished NYSDOH data

Results:

I. scapularis adults
2003 – 2006*

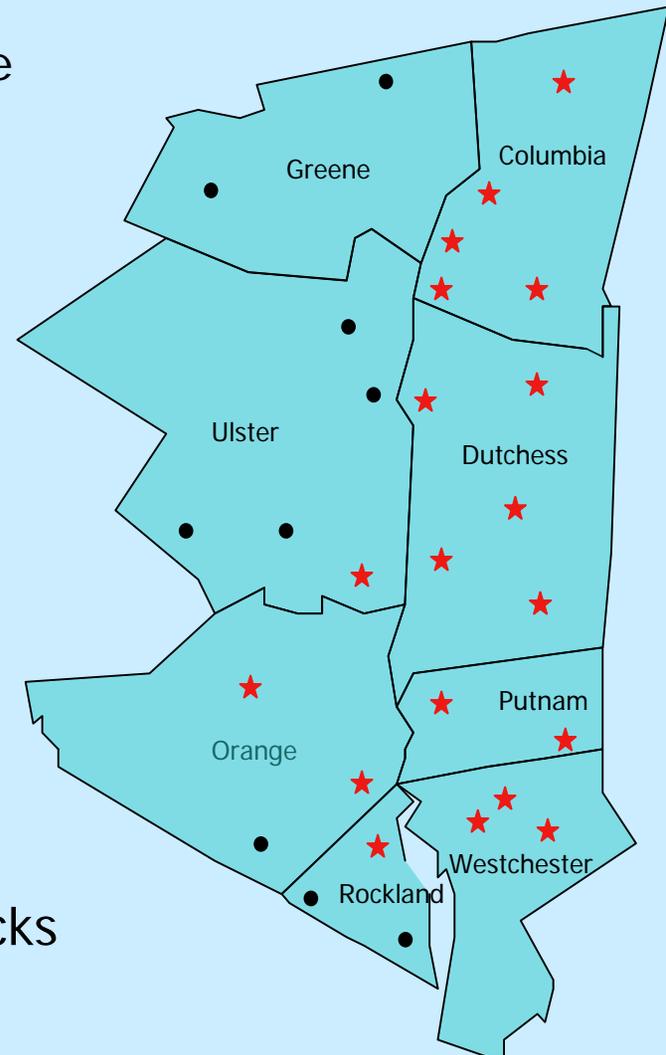
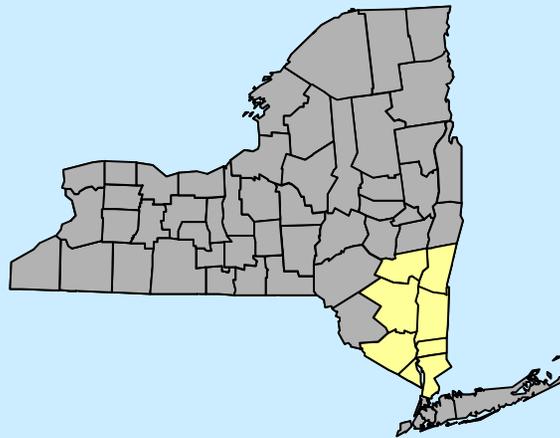
<i>B. burgdorferi</i>	= 44%
<i>A. phagocytophilum</i>	= 13%
<i>B. microti</i>	= 2%



*Unpublished NYSDOH data

Results:

Tick-borne Pathogen Surveillance in the Hudson Valley, New York 2002-2006



● Collection Sites

★ Sites with *B. microti* Positive ticks

Results (polymicrobial infection):

- **Rates of co-infection (overall)**
 - Nymphs (3,300 tested):
 - *B. burgdorferi*/*B. microti* : 1.2%
 - *B. burgdorferi*/*A. phagocytophila* : 0.7%
 - *B. microti*/*A. phagocytophila* : 0.06%
 - Adults (7,904 tested):
 - *B. burgdorferi*/*B. microti* : 1.6%
 - *B. burgdorferi*/*A. phagocytophila* : 6.2%
 - *B. microti*/*A. phagocytophila* : 0.6%

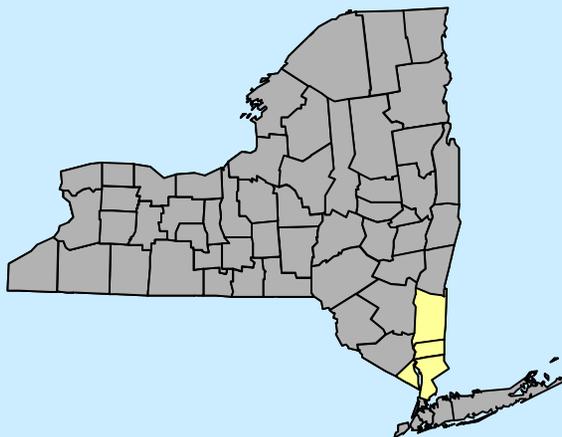


Results (polymicrobial infection):

Triple-infected ticks!

o 32 adult *I. scapularis* (24F, 8M)

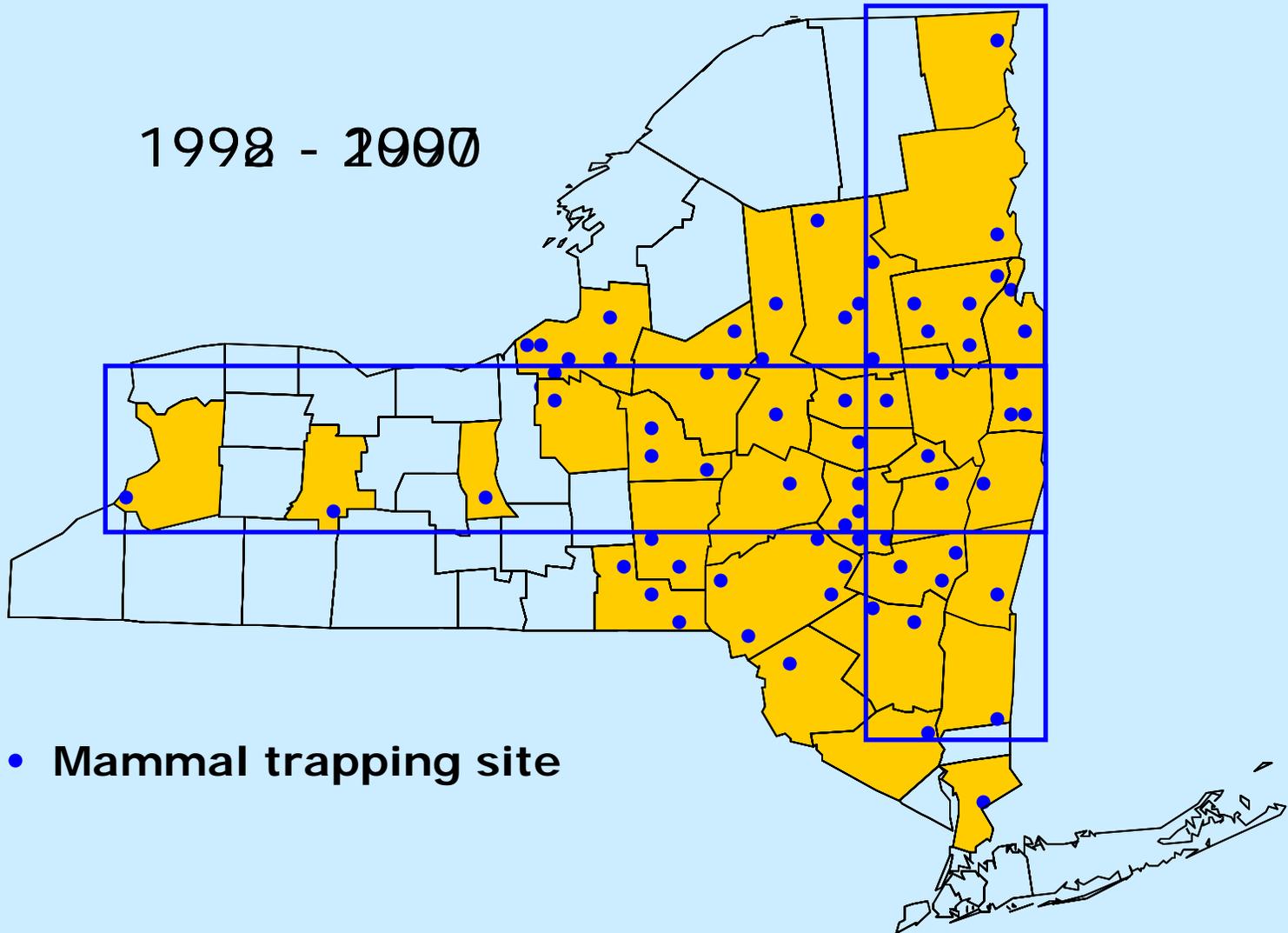
- 5 sites in 4 counties
- Dutchess, Westchester, Rockland, and Putnam



* Unpublished NYSDOH data

Small Mammal Collections

1998 - 2000

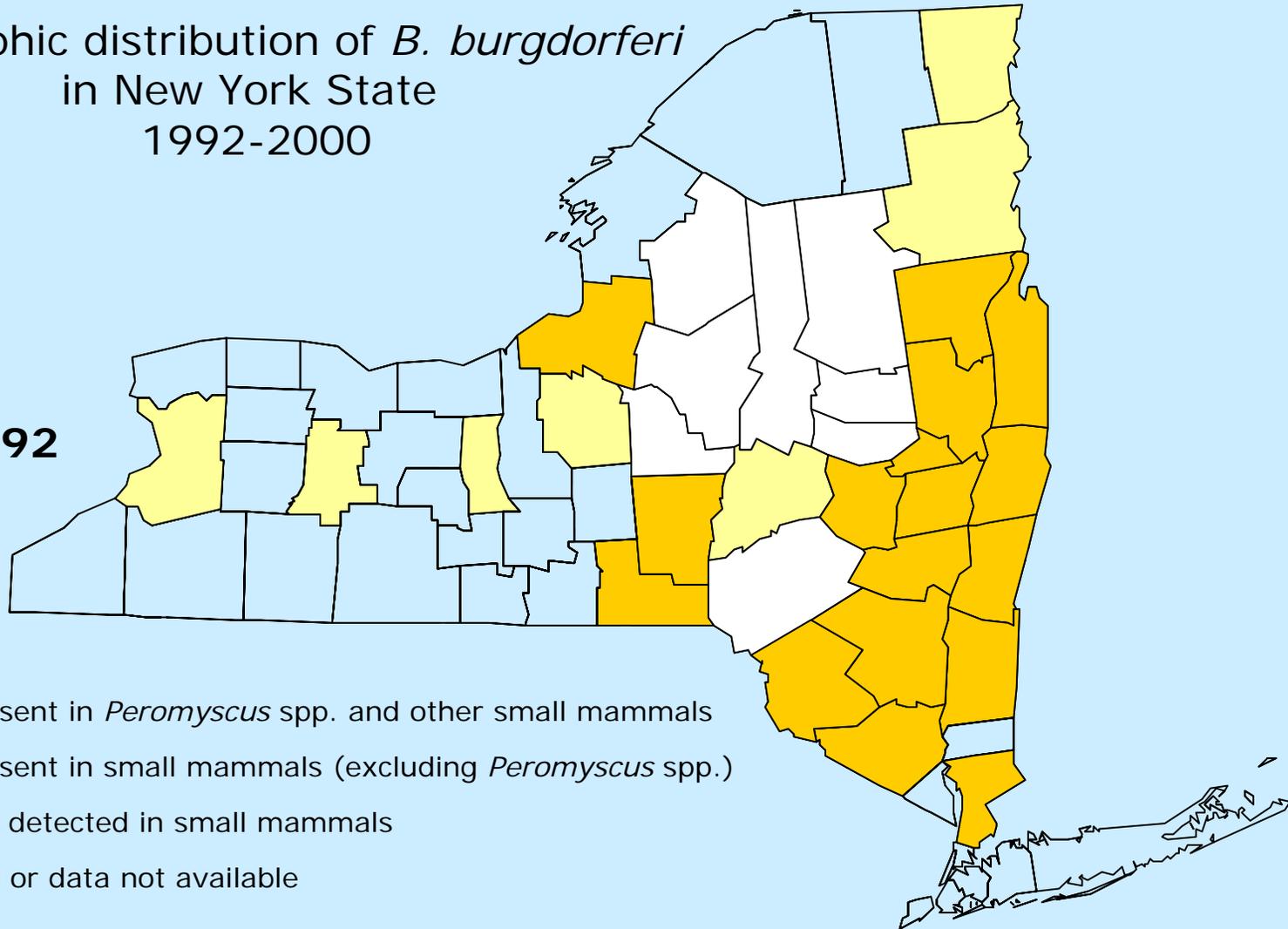


- Mammal trapping site

Small Mammal Collections

Geographic distribution of *B. burgdorferi*
in New York State
1992-2000

n = 4,792



Ticks from Deer

- Long-term monitoring (20 yrs) at NYSDEC hunter check stations in Central NY
- Added multiple sites in Western and Eastern NY in 2005
- *I. scapularis* 1st documented on deer in Central NY in 2004
- Comparatively few *I. scapularis* found on deer in Central and Western regions



The “End”



Questions?