



WHAT ARE THE FACTORS THAT EXPLAIN LYME DISEASE PREVALENCE RATE?

United-States cases

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Outbreak's history

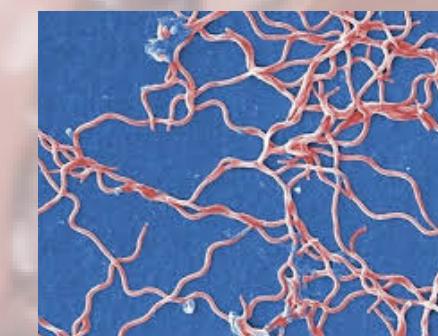
Lyme Disease is caused by the bacterium *Borrelia* carried by some ticks.



Deer tick
(*Ixodes scapularis*)

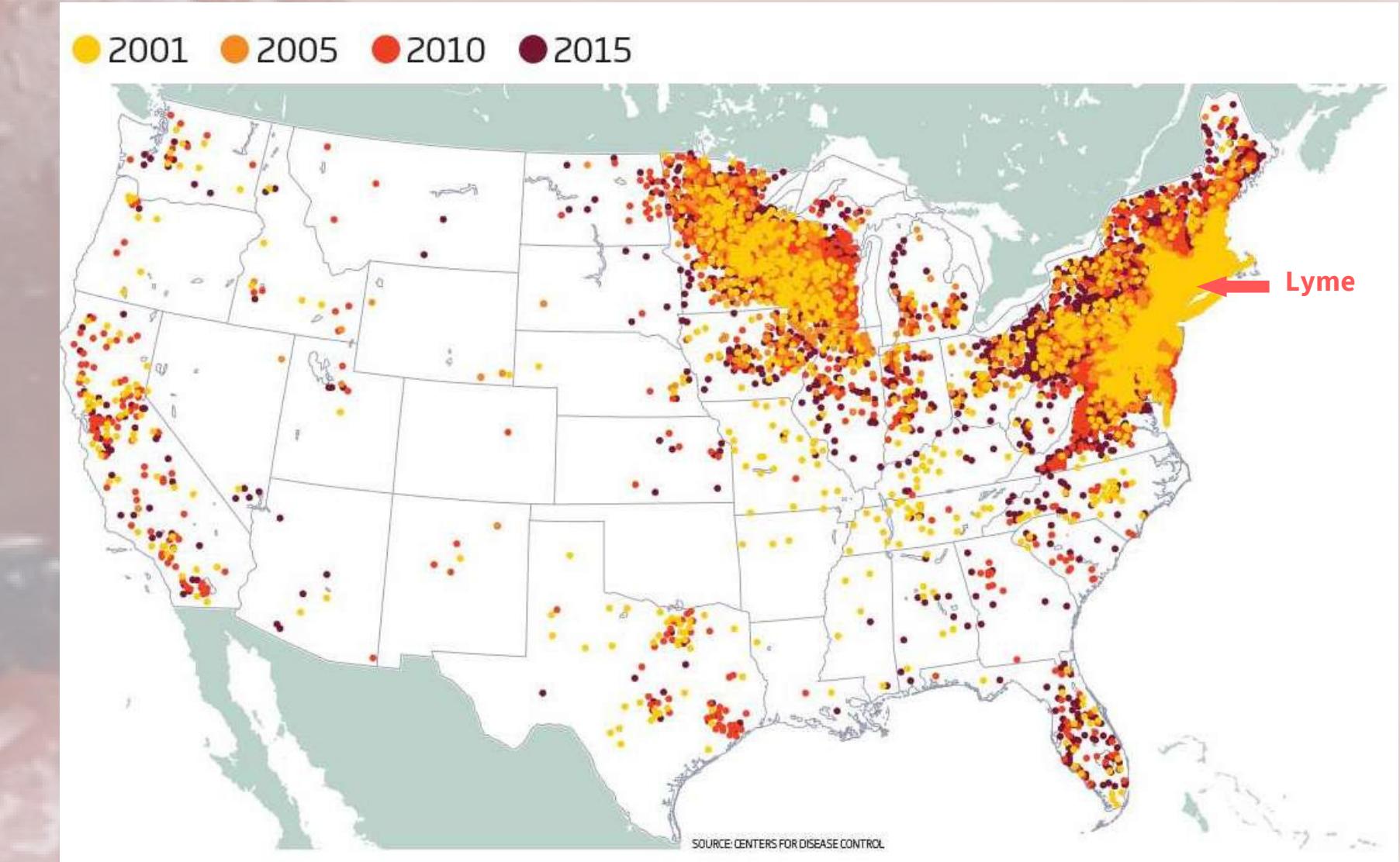


Blacklegged tick
(*Ixodes pacificus*)

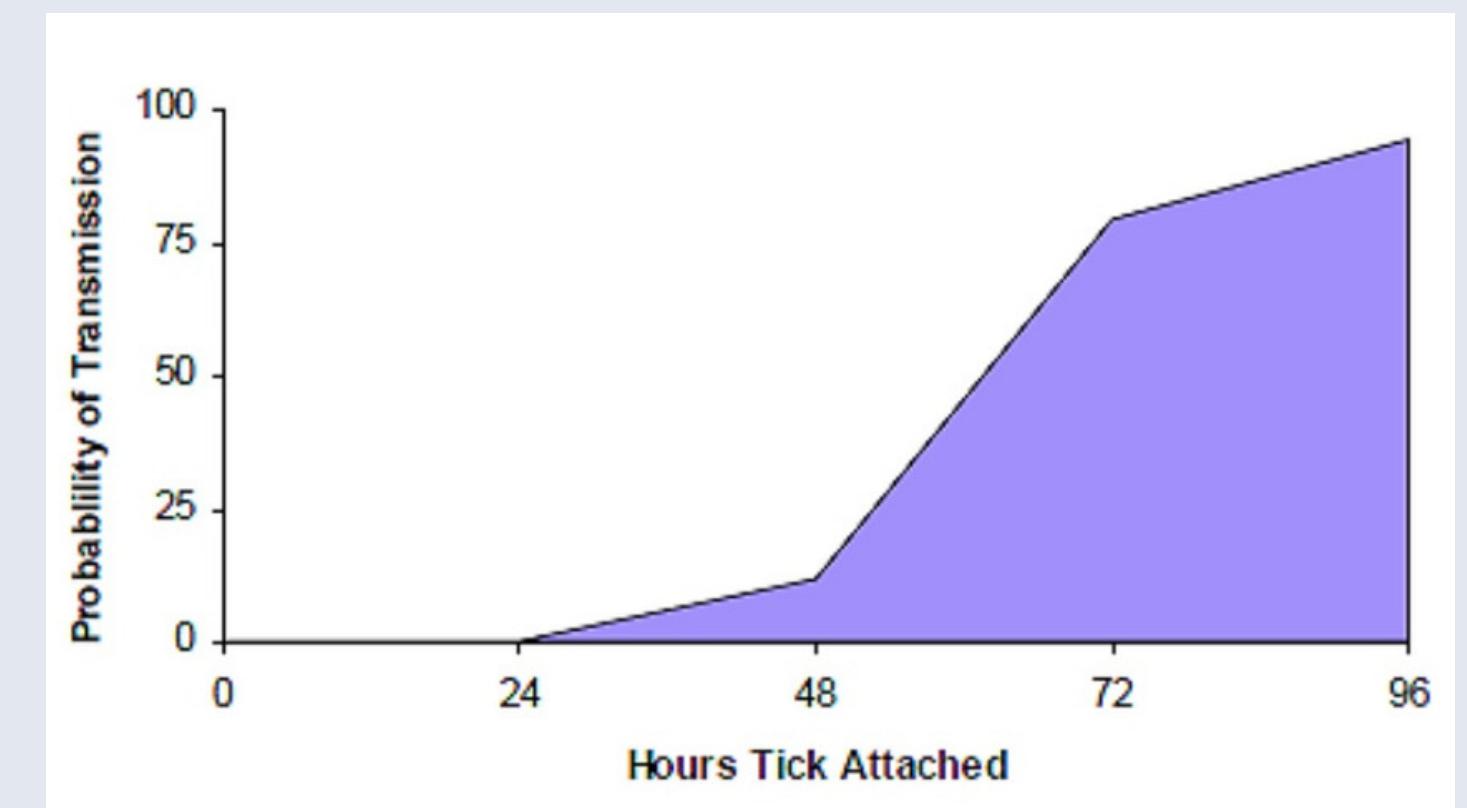
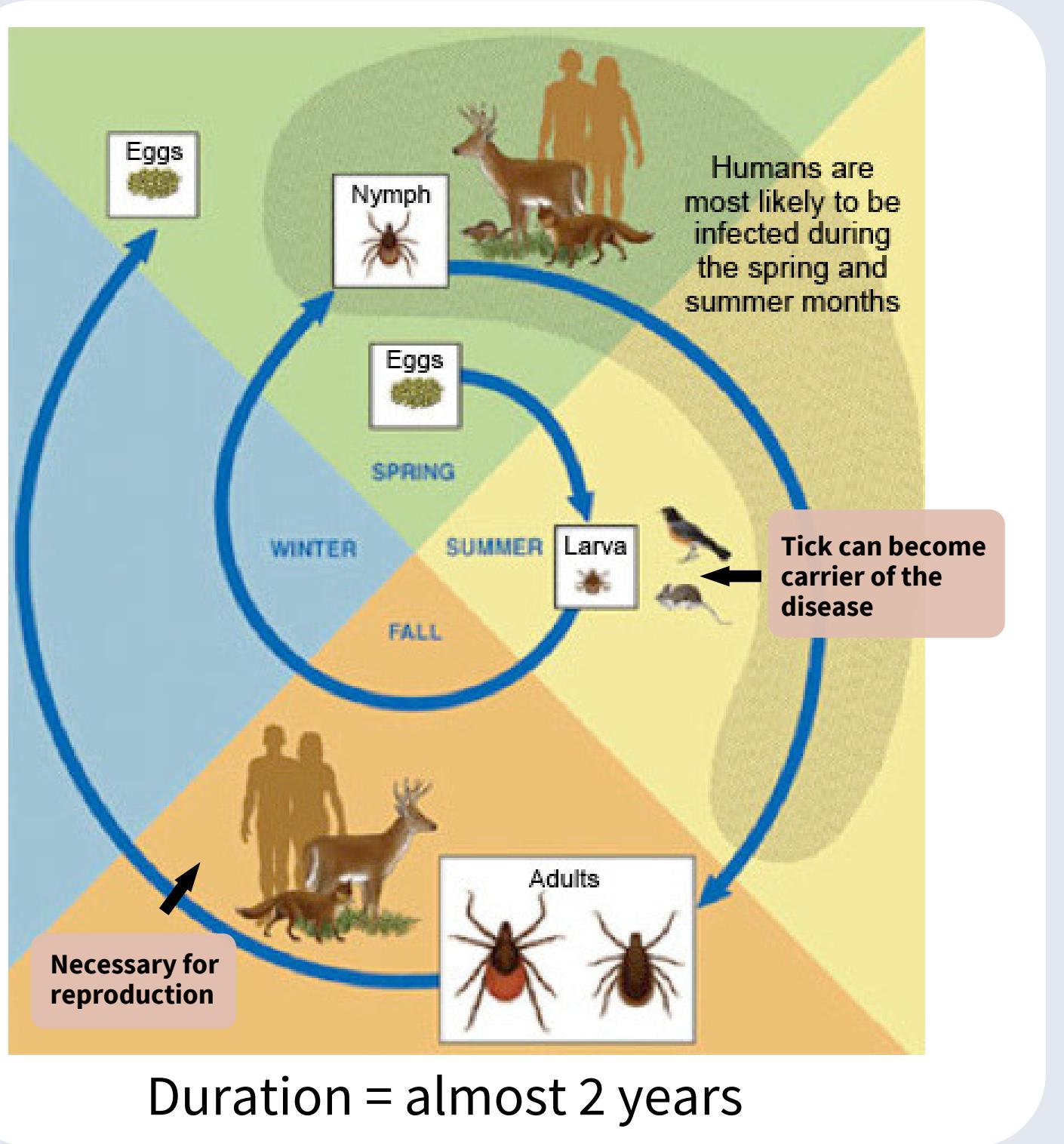


(*Borrelia*)

First cases in the US → 1975 (Lyme, Connecticut)

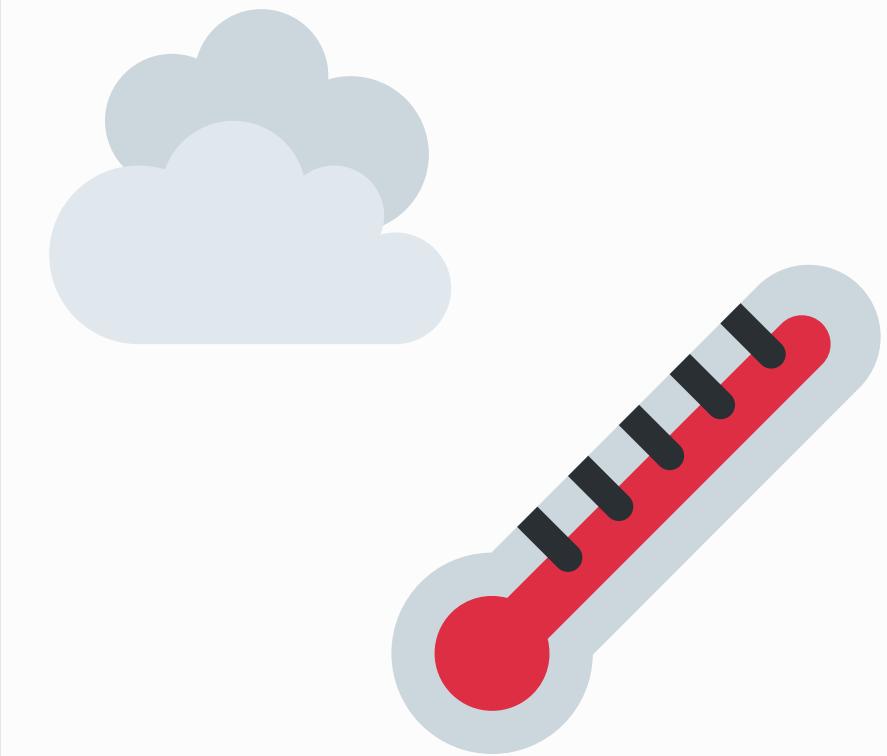


Tick's life cycle

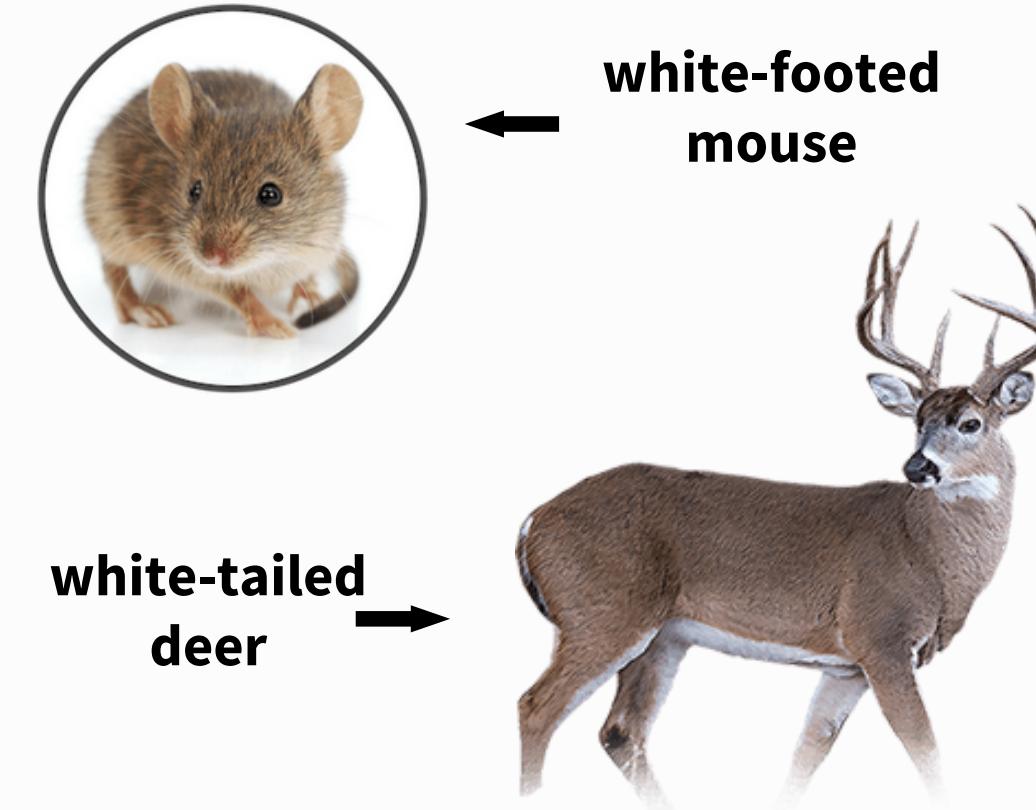


Objectives: quantify the effect of different variables

CLIMATIC



BIOLOGICAL



GEOGRAPHIC



Hypotheses



CLIMATIC

There will be a **positive** relationship between temperature and infection rate

BIOLOGICAL

There will be a **positive** relationship between deer/mouse counts and infection rate

GEOGRAPHIC

Infection rates should be **higher** in eastern states

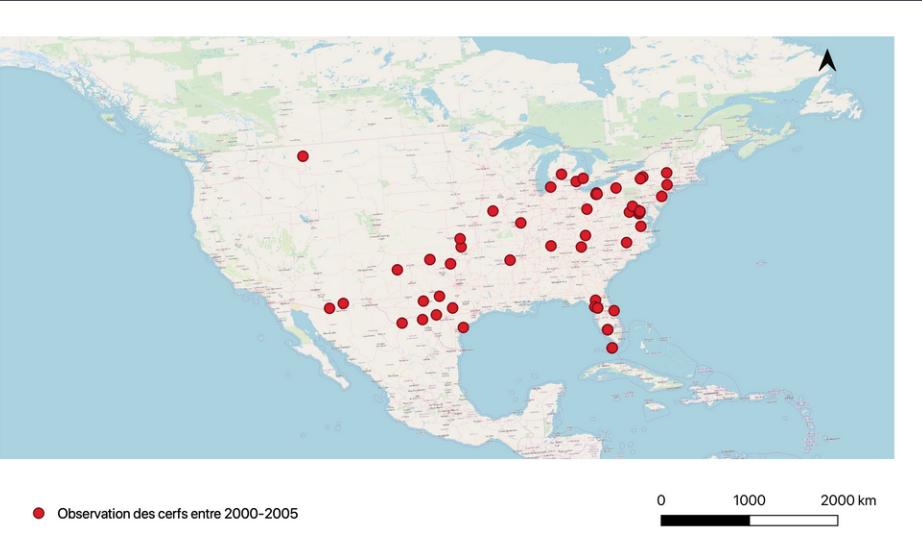
Observations



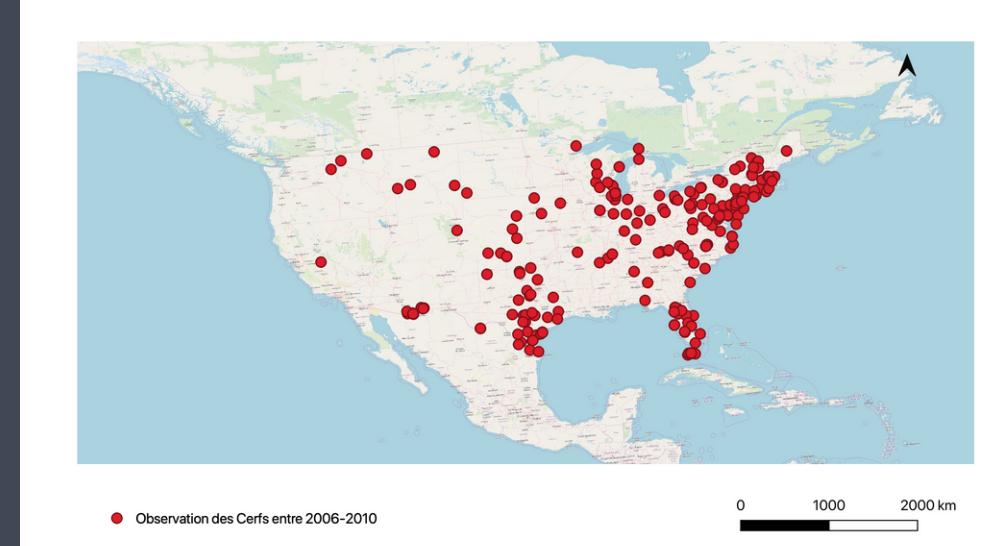
WHITE-TAILED DEER /



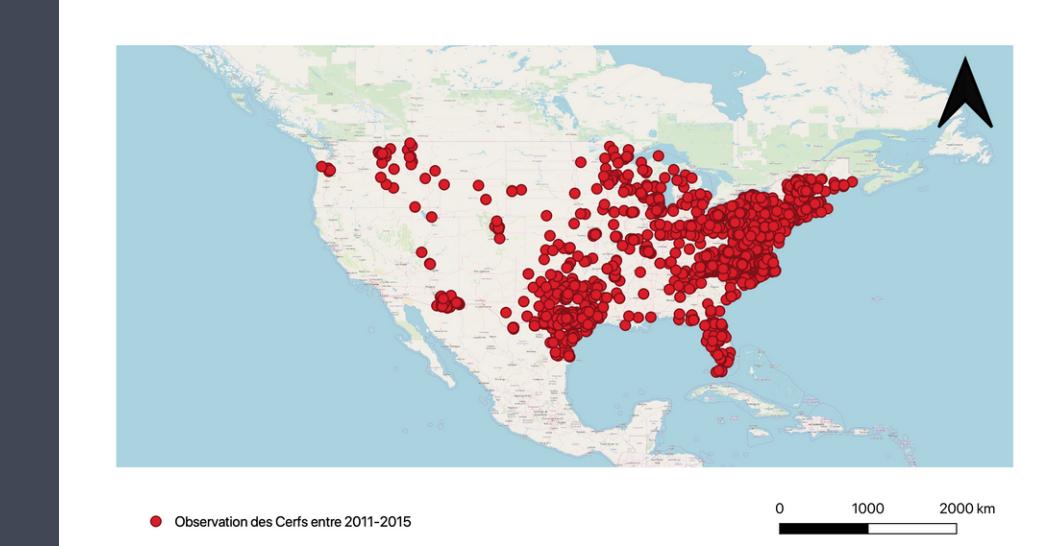
WHITE-FOOTED MOUSE



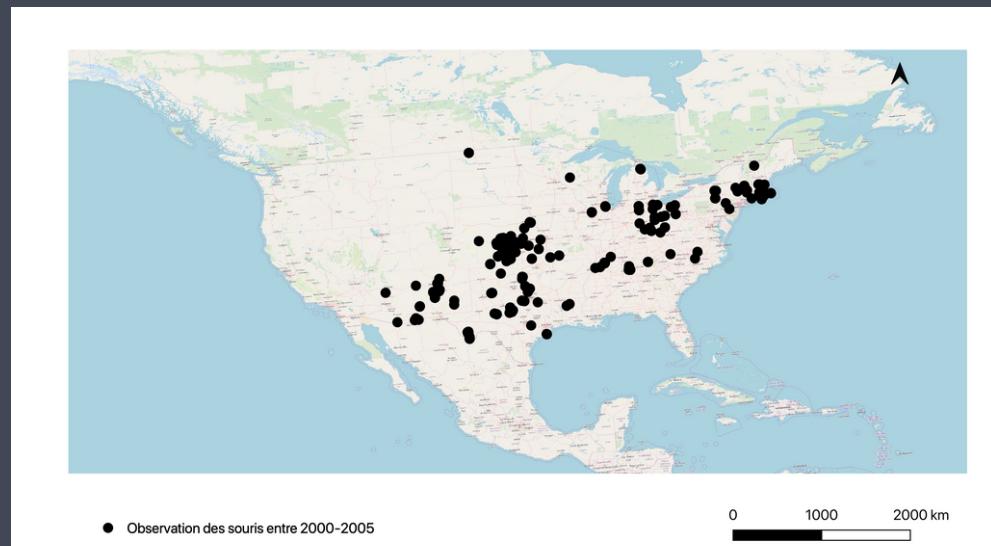
2000 - 2005



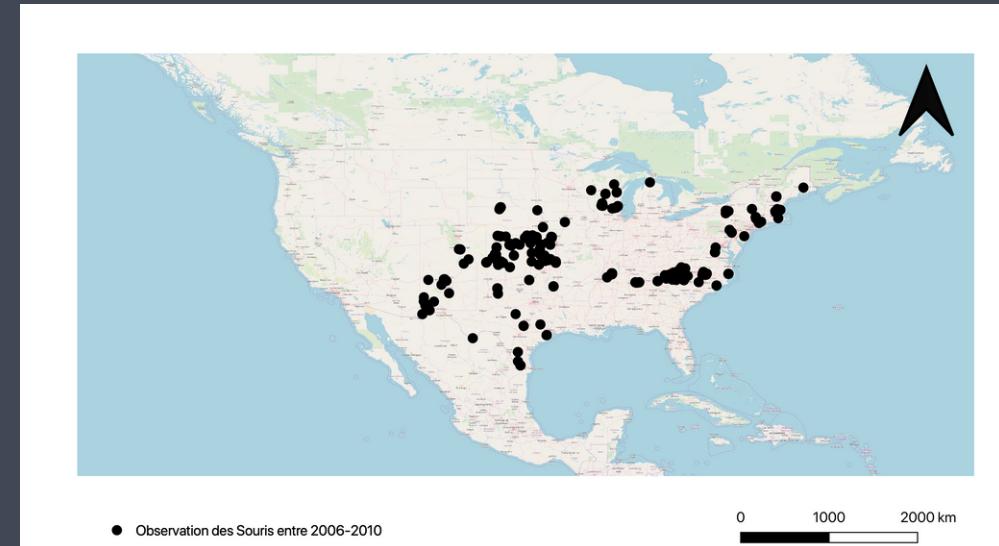
2006 - 2010



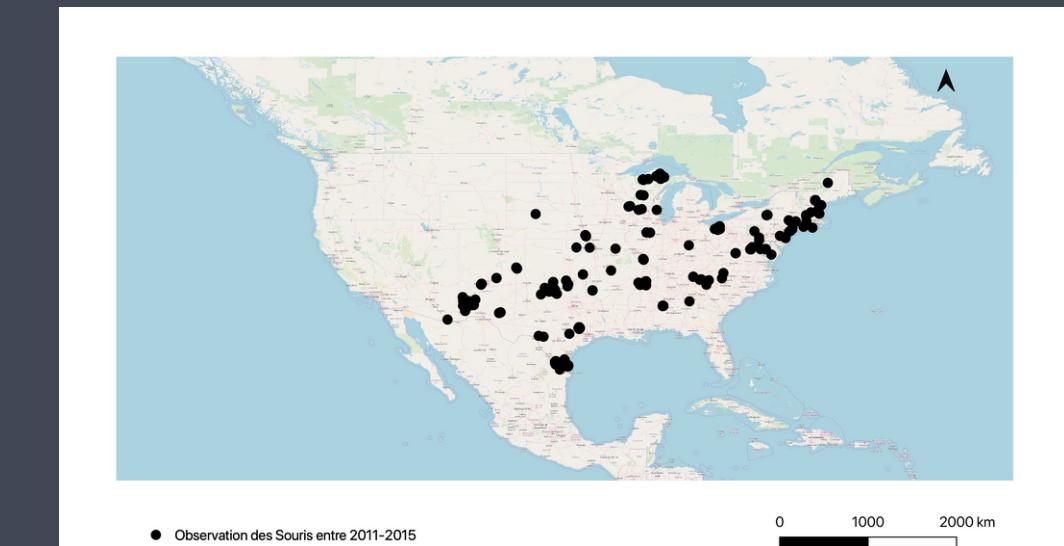
2011 - 2015



2000 - 2005



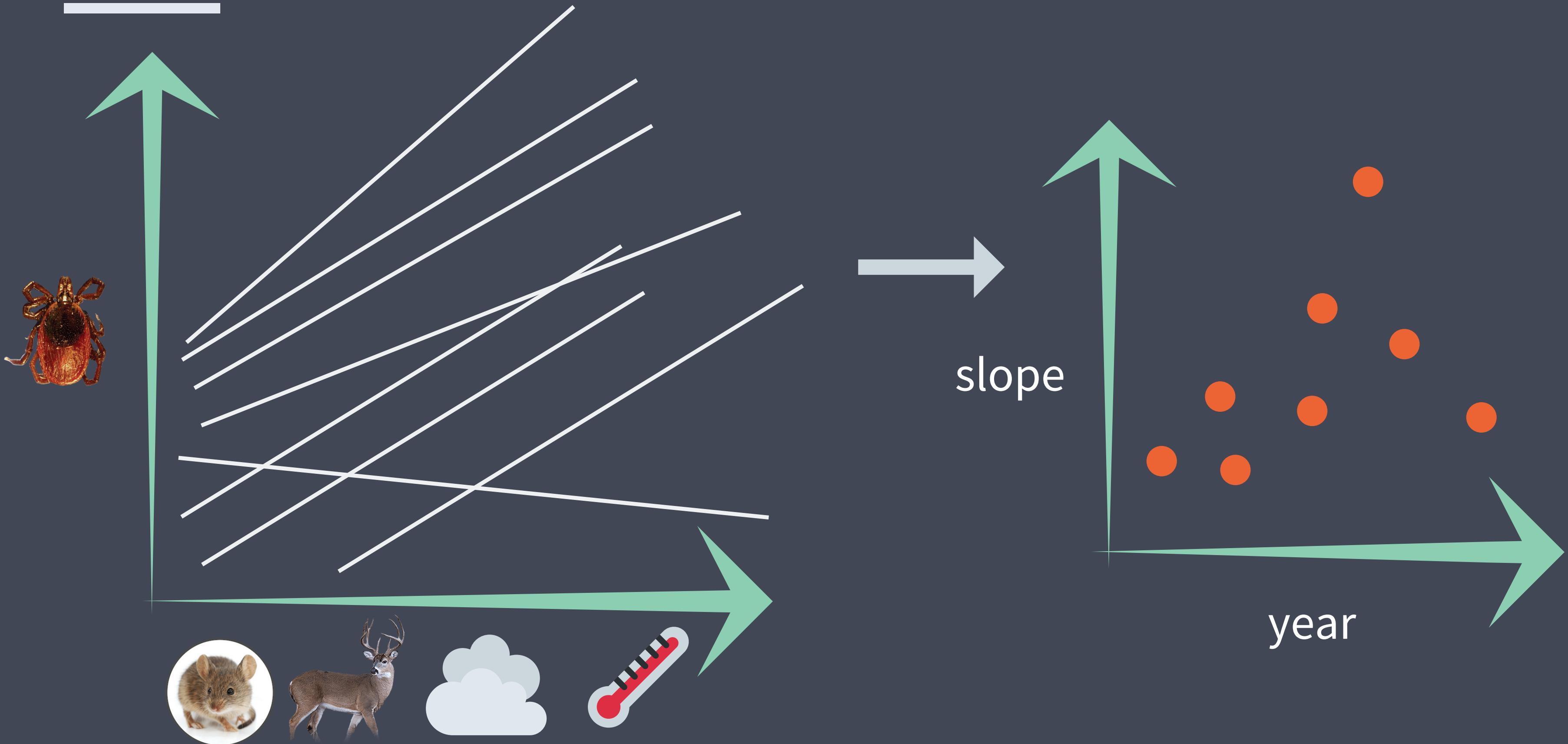
2006 - 2010

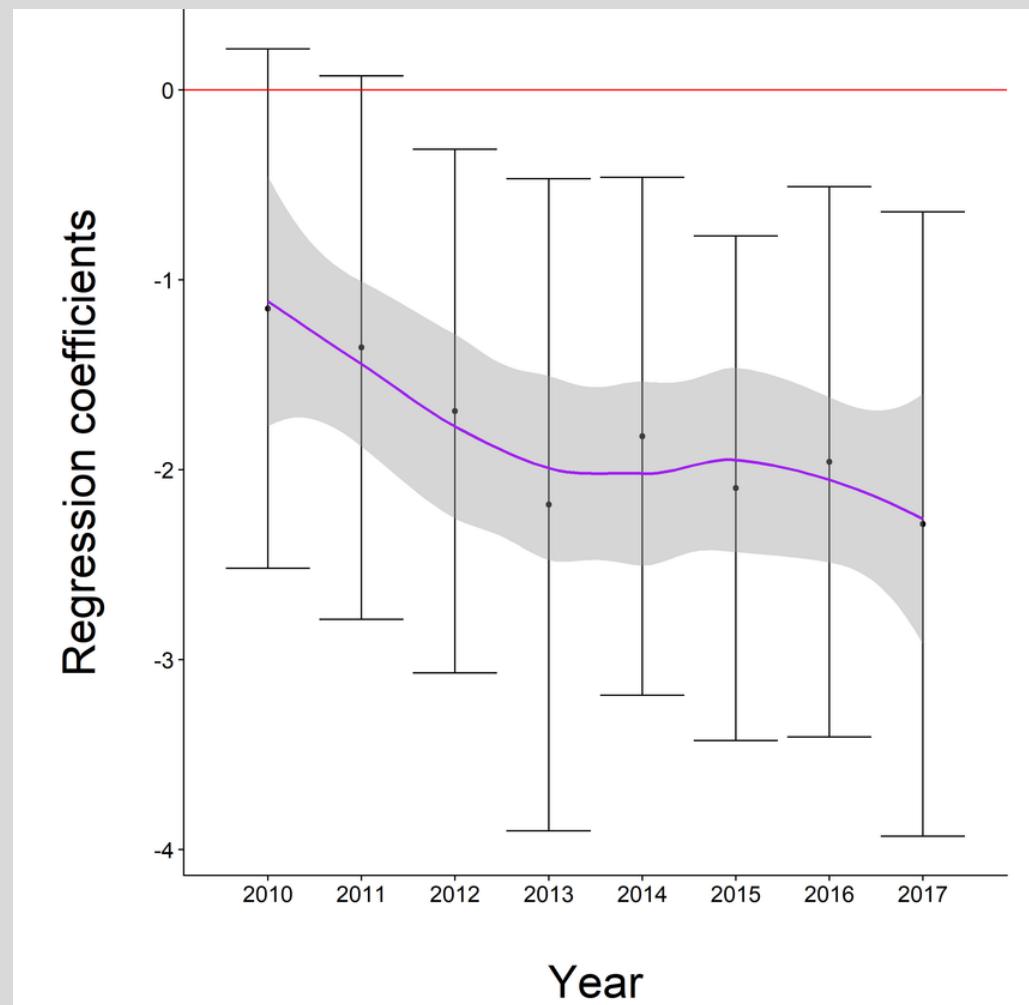


2011 - 2015

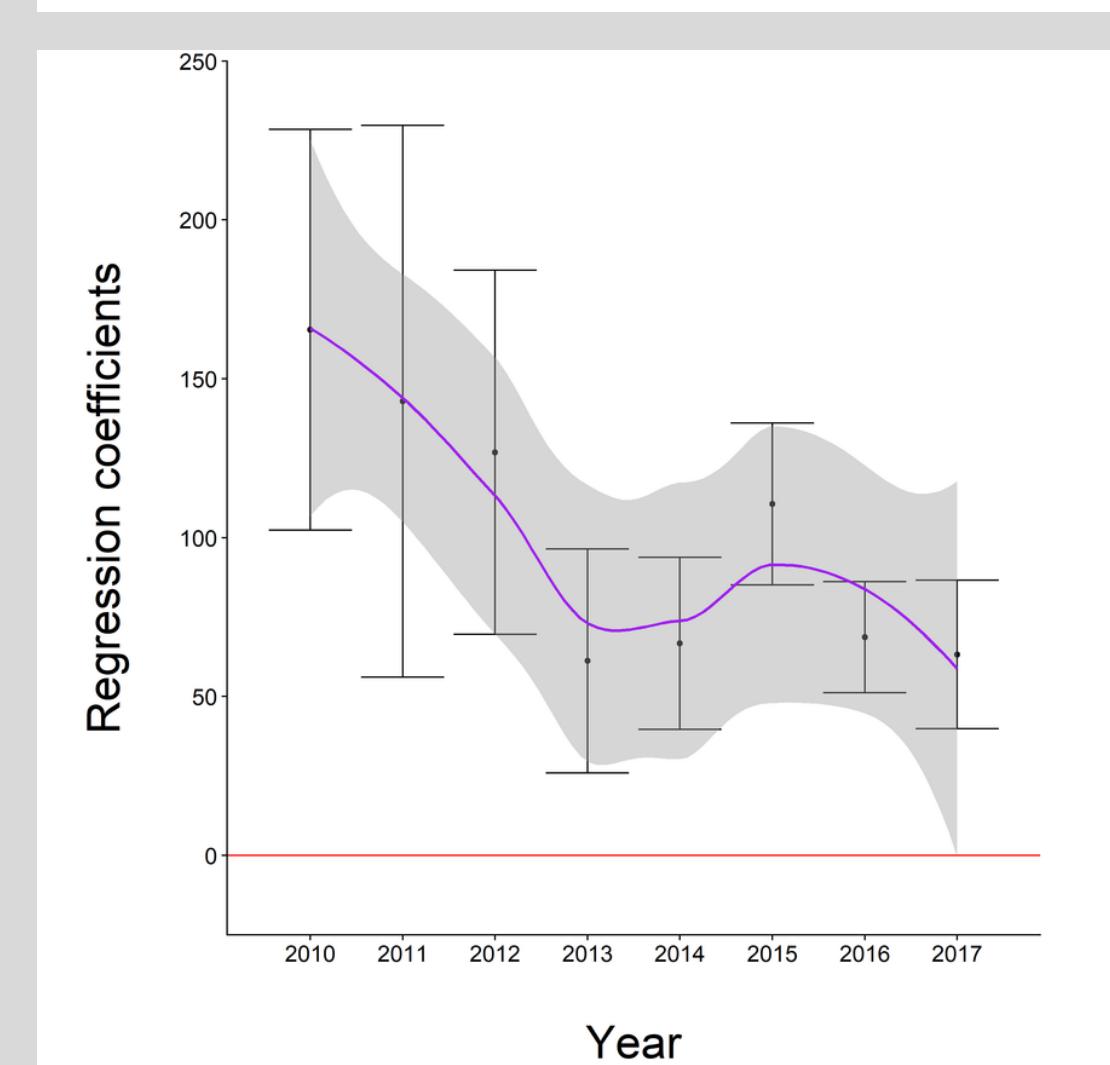
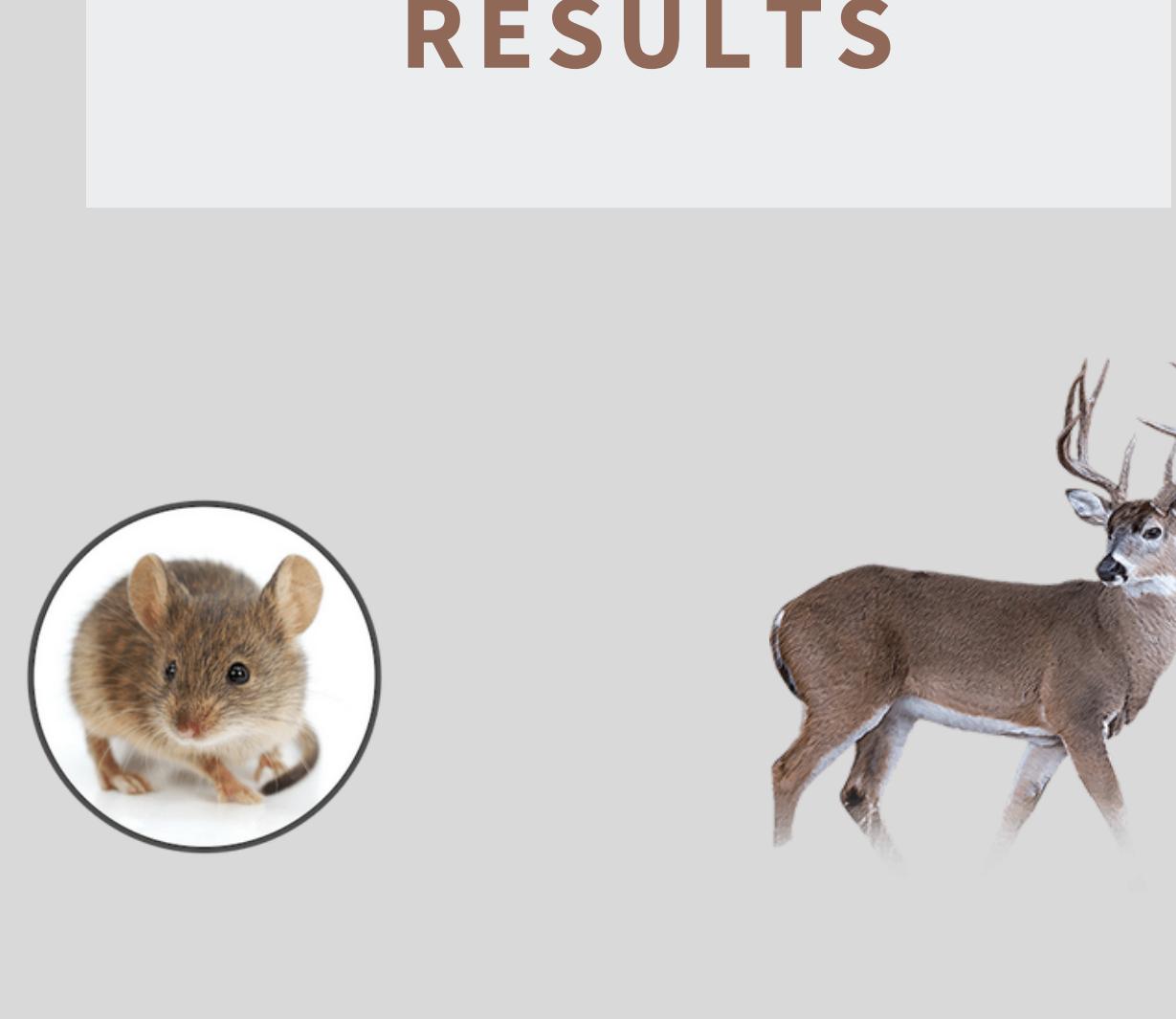
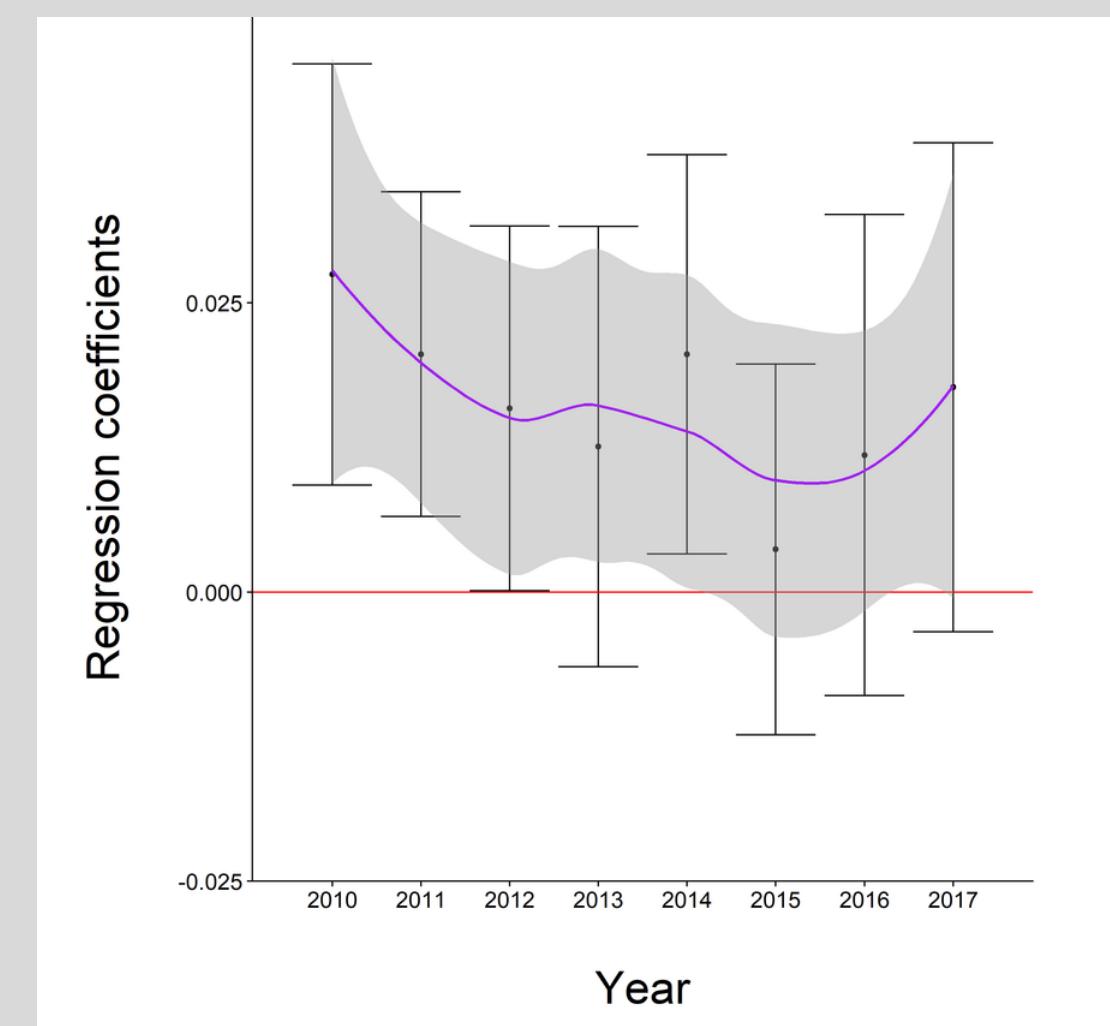
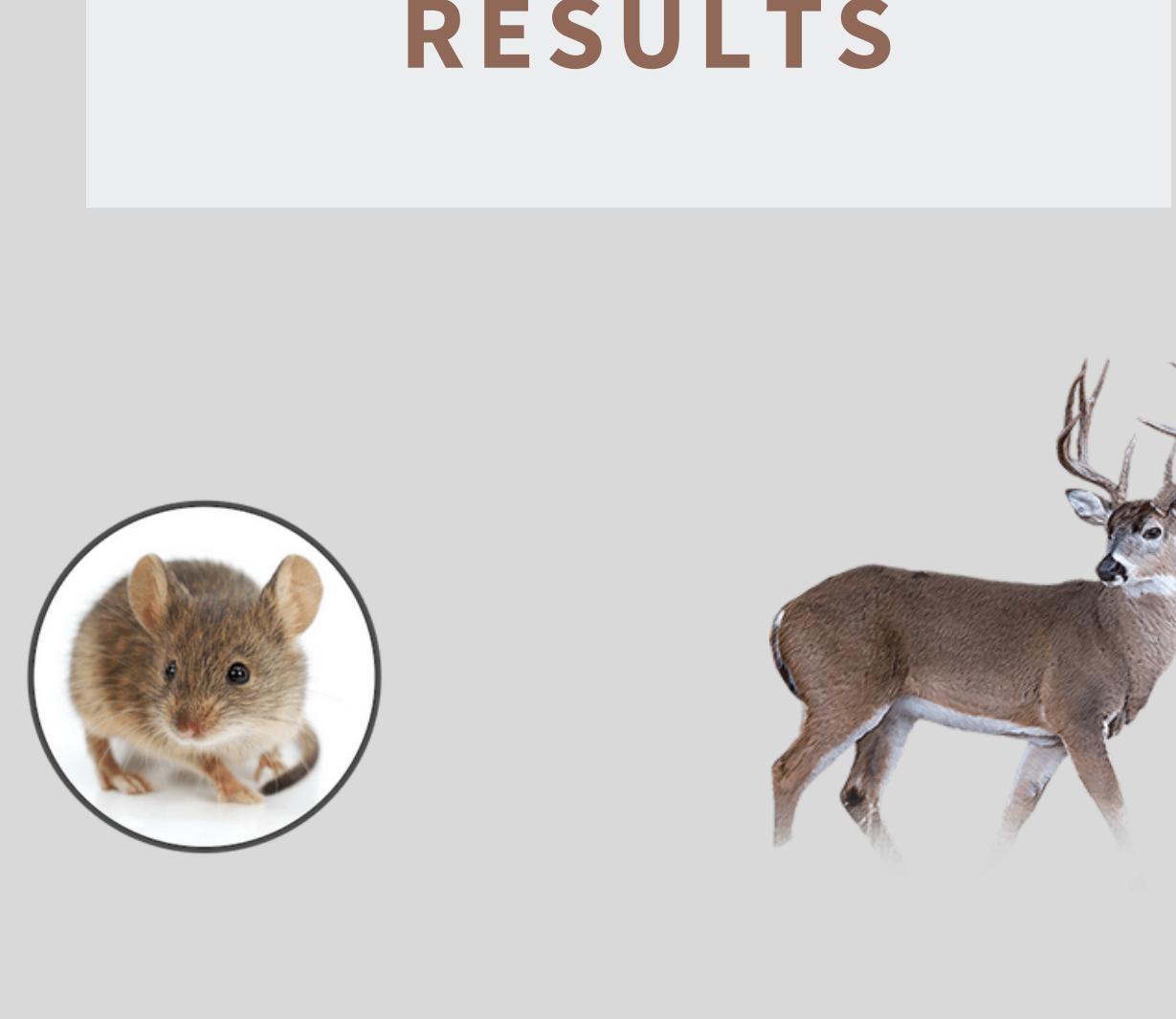


Method





RESULTS



Multiple regression

Table 1: Multiple regression results

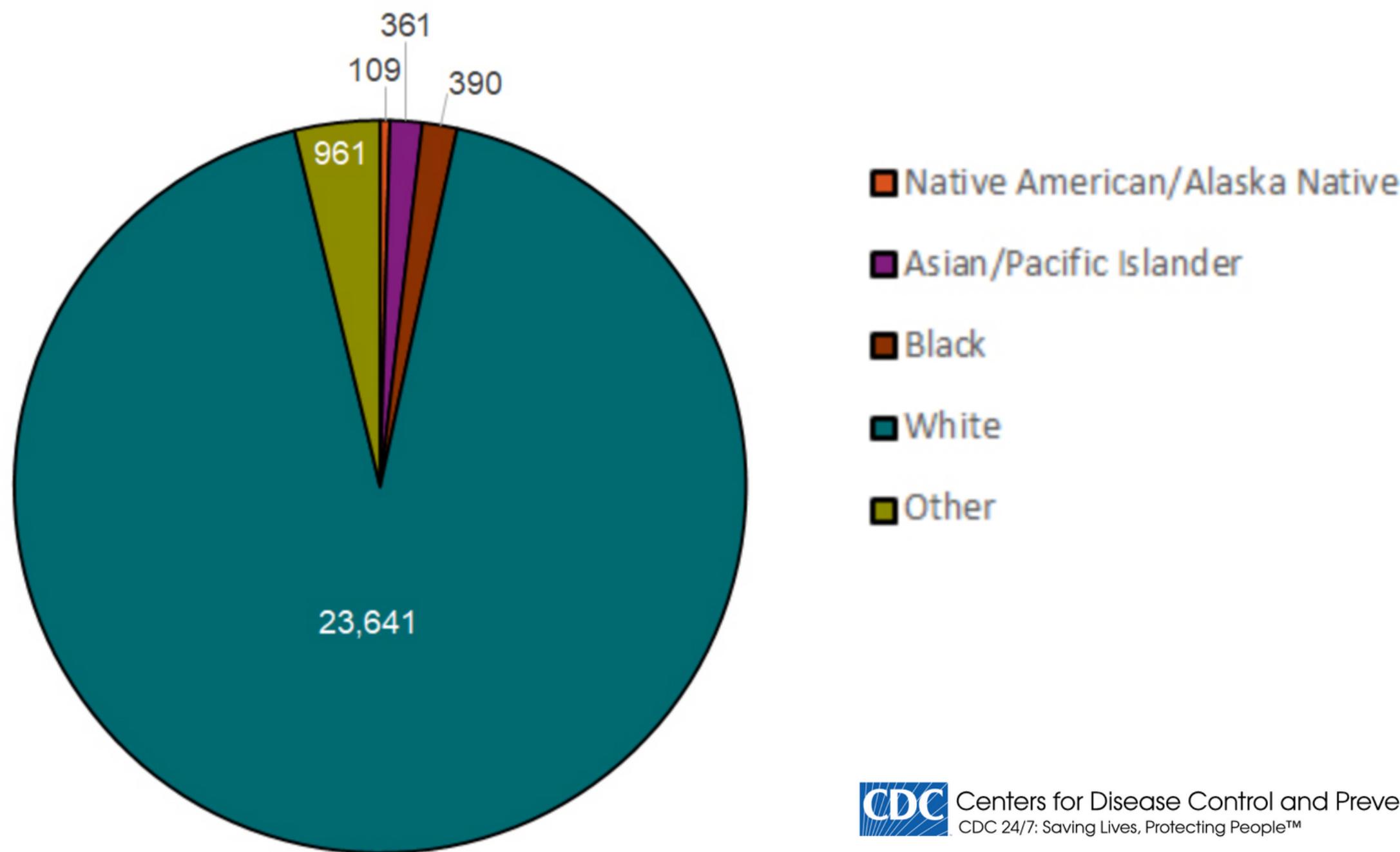
DF = 379

R-squared = 0.4947

	Estimate	std. error	t-value	p-value
Intercept	12.50	2.85	4.38	***
Precipitations	0.02	0.002	7.92	***
Average temperature	-2.24	0.21	-10.82	***
Deer population	48.16	4.60	10.48	***
Mouse population	81.95	22.32	3.67	***

*** = 0.001

Lyme disease—Reported confirmed and probable cases by race of patient, United States, 2017



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

To go
farther...



**HAVE A
NICE
SUMMER!**

