Laura Hungerford, DVM, MPH, PhD, CPH
Dept. Epidemiology and Public Health

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

02:08

Epidemiologic Questions

- Is there a spatial pattern?
  - Visualization
  - Clustering?
  - Other patterns?
- Do patterns co-distribute?
- Do risk factors differ with location?
  - Between parts of the study area?
  - Combining spatial and nonspatial factors
- How does disease spread?

Salmonella

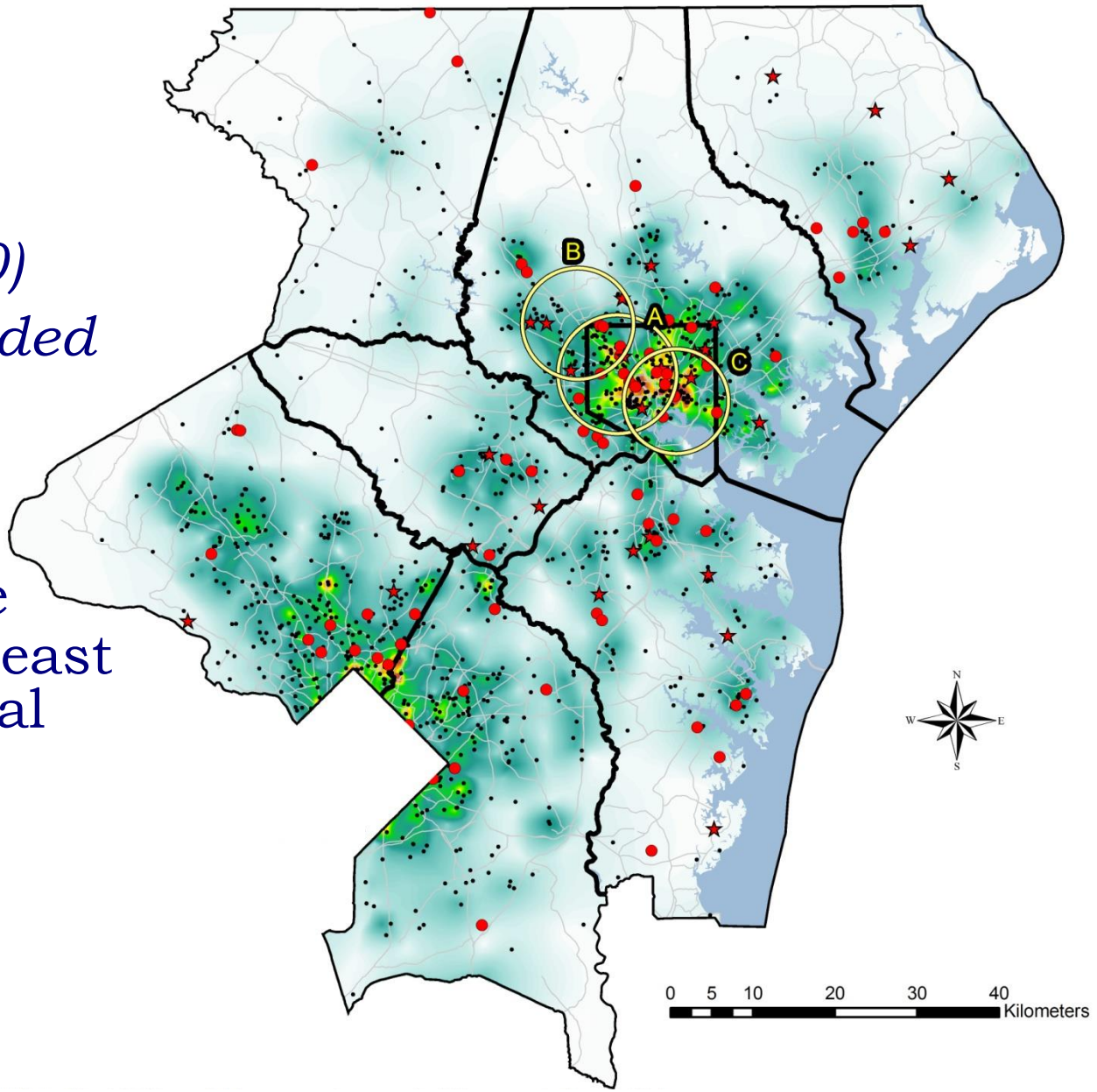
Subsample (n=100) with MIC's provided by NARMS

- Pan-susceptible
- Resistant to at least one antimicrobial

Global

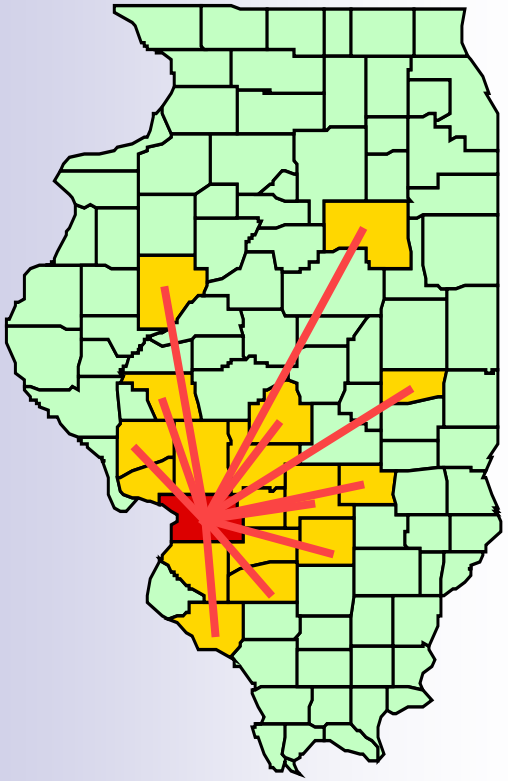
clustering

Local hot spots

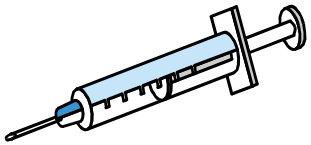


02:03

Anaplasmosis in Illinois



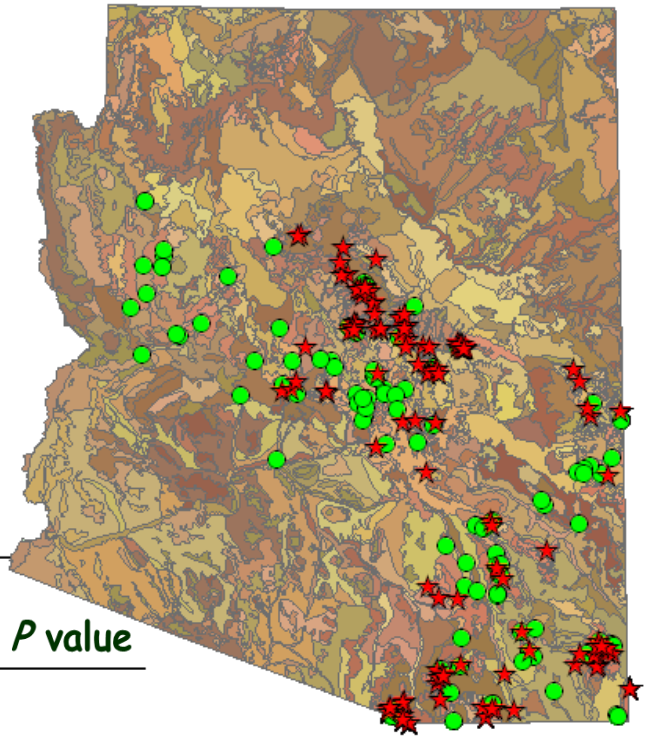
Serosurvey of 5,000 cattle Significantly clustered



MORAN'S I

W matrix	Z value
Borders	7.2
Markets	10.1
Market, no borders	6.7

Capture new data and relationships



Variable	β coeff.	SE	Adj. OR	95% CI	*P* value
intercept	-3.086	0.6247			
elevation	0.002	0.0004	2.66	2.66-2.67	<0.0001
crayfish	0.960	0.4602	2.61	1.06-6.44	0.0370
nearby source	-1.885	0.4248	0.15	0.07-0.35	<0.0001
nearby disappearance	1.463	0.4096	4.32	1.94-9.64	0.0004

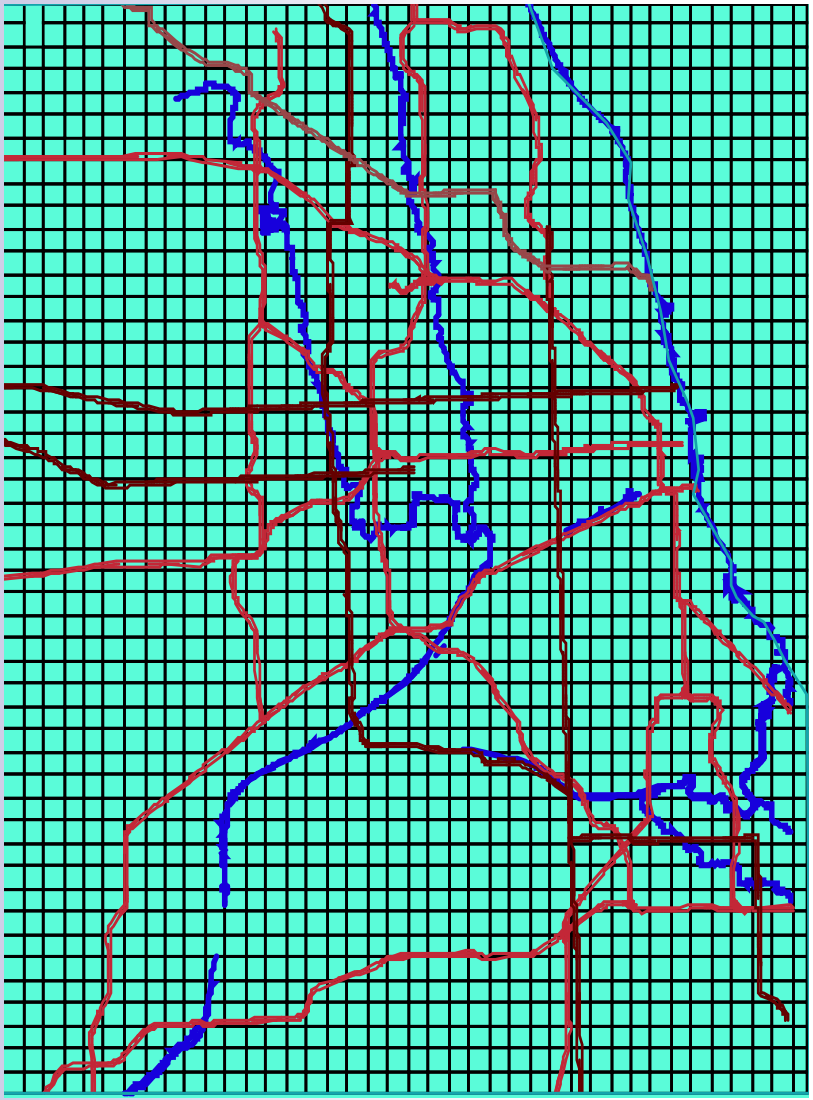
Hosmer-Lemeshaw goodness-of-fit = .86

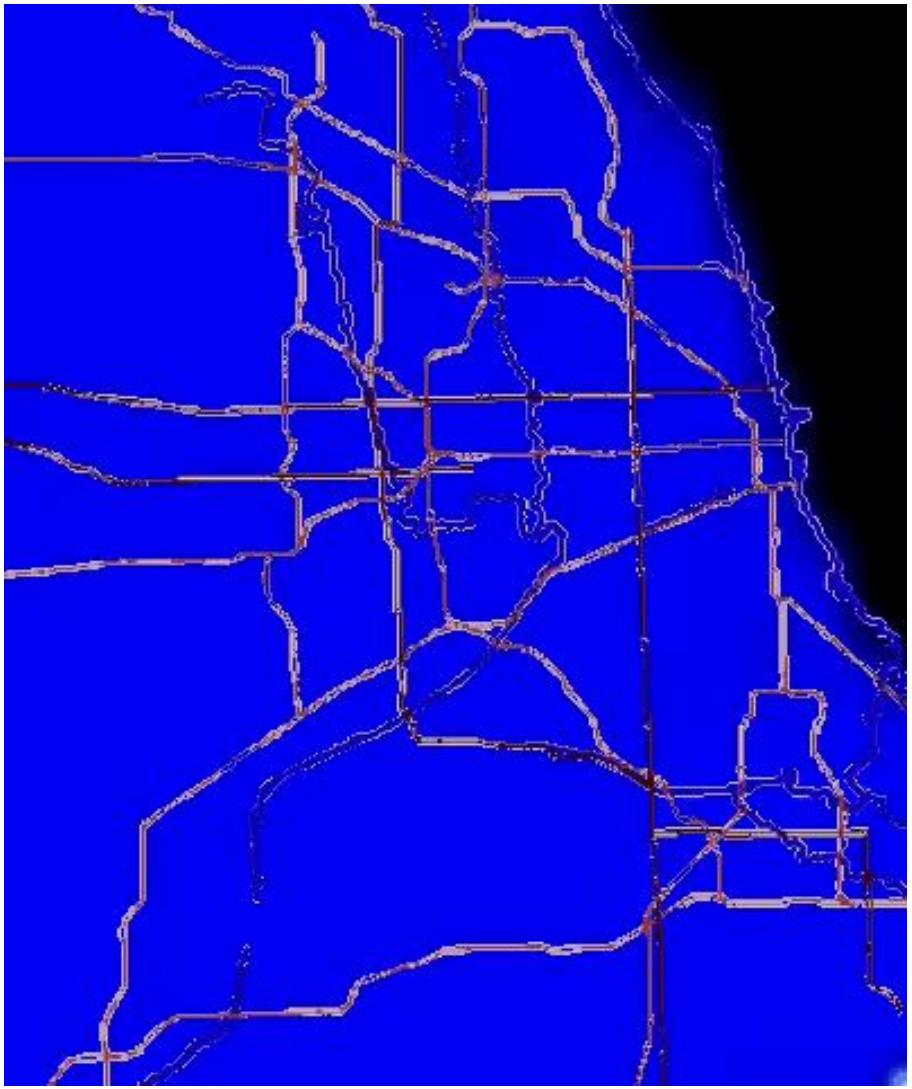
01:52

Modeling approach:

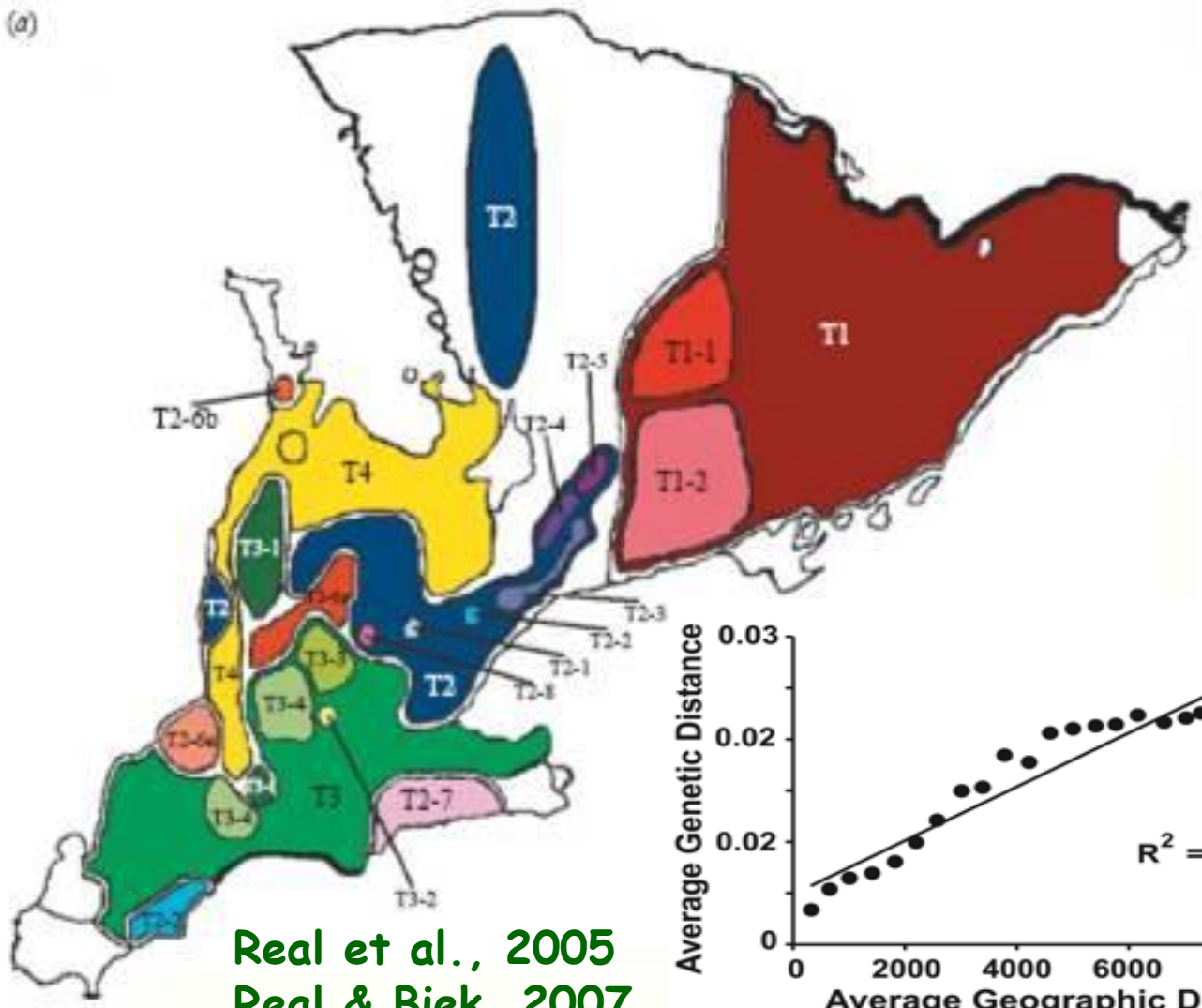
- Dynamic model of rabies in raccoon population with density and movements
- Base grid maps of raccoon habitat, barriers and populations (GRASS)
- Link to run model within each cell of grid over many iterations using SME

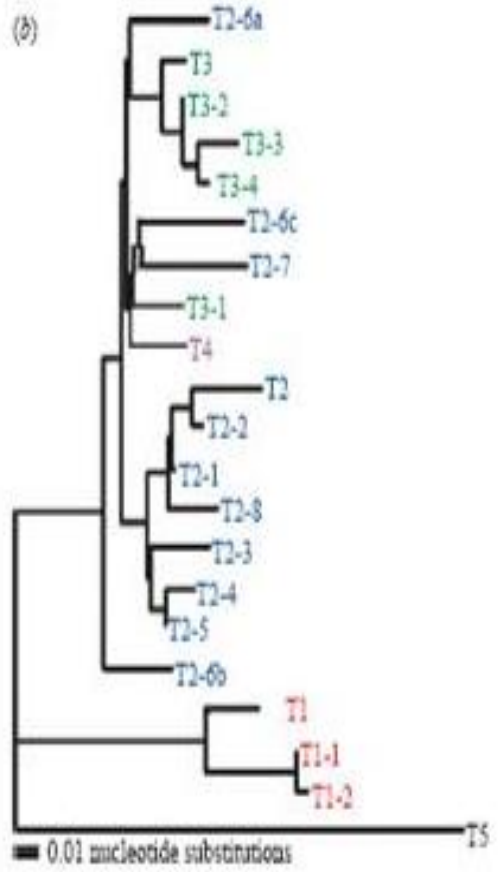
01:51





Is there a spatial pattern?





Real et al., 2005
Real & Biek, 2007

01:19