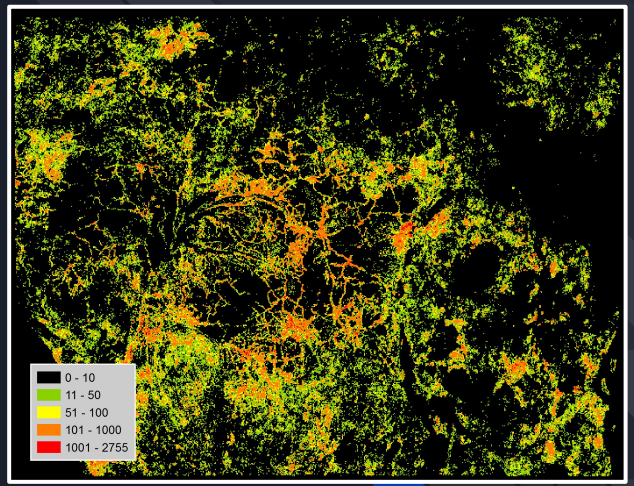
Deforestation and Malaria

Anecia Gentles

Background: Recent studies in various systems have shown that the mosquito species, or vectors, that carry *P. falciparum* are susceptible to habitat changes due to deforestation.

Statistical Question: Is there a correlation between rate of deforestation and the prevalence of malaria at a particular time and place?

Mechanistic Question: Can deforestation data be used as a predictor of changes in malaria prevalence by its effect on mosquito births?



Thanks to: Kim Kivera and Nina Sokolov

Statistical Question

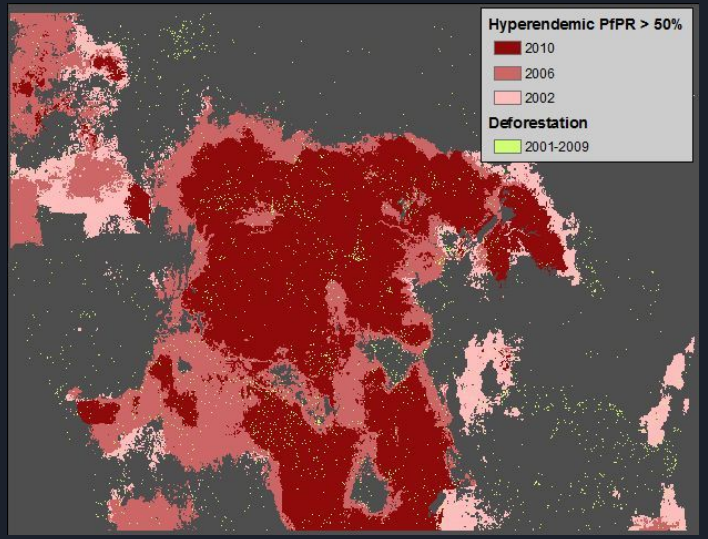
Is there a correlation between rate of deforestation and the rate of malaria prevalence change at a particular time and place?

Response Variable: prevalence of malaria at time = t+1

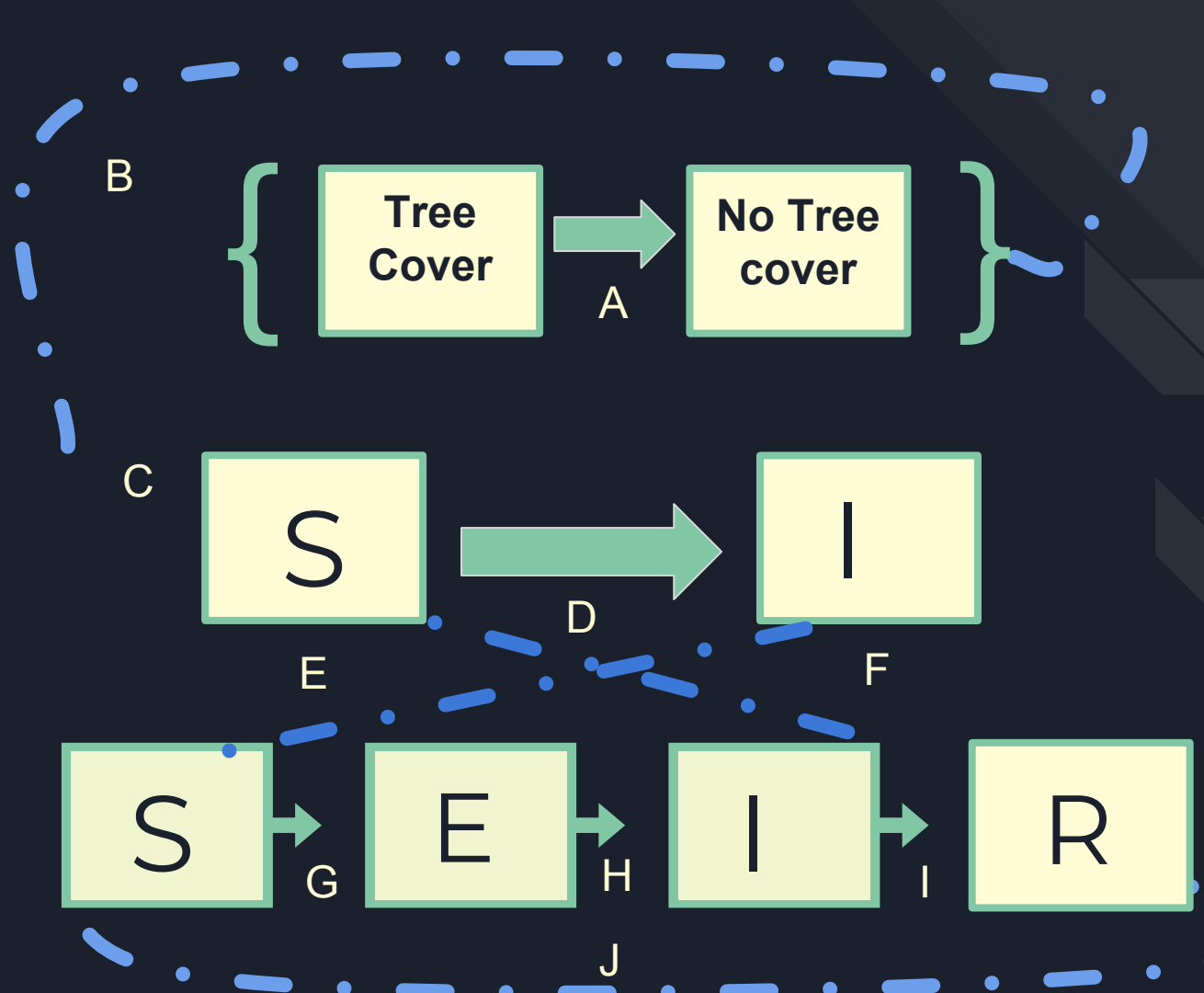
Predictor Variable: percent of deforestation

Function & link: Gaussian, identity

Hypothesis : The prevalence of malaria will increase with deforestation over time.



Function: glm (malaria_prevalence~ percent deforestation), family= “gaussian”)



Mechanistic Question: Can deforestation data be used as a predictor of changes in malaria prevalence by its effect on mosquito births?

A: deforestation rate
B: rate that deforestation affects mos. birth rates
C: mos. Birth rate
D: rate of mos. Infection
E: rate that S.mos die
F: rate that I.mos die
G rate that S.hum become exposed
H: rate that Exp. Become Inf.
I: rate that Inf. Become recovered
J: rate of waning recovery

Next Steps

- Collect empirical data on malaria prevalence and percent deforestation in a certain region for a number of years
- Develop a sensitivity analysis to describe the effect of deforestation on mosquito birth rate
- Include other variables such as mosquito migration and specific land use in a future model