

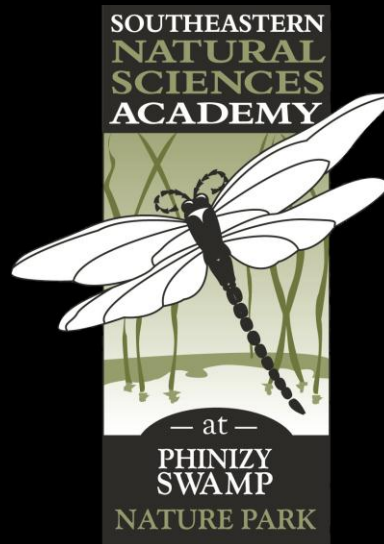
Fecal coliform, mosquitoes, and raw sewage, Oh My!!

Oscar Flite, Ph.D. (SNSA)

Jason Moak (SNSA)

Shawn Rosenquist, Ph.D. (SNSA)

Fred Koehle (A-RC)



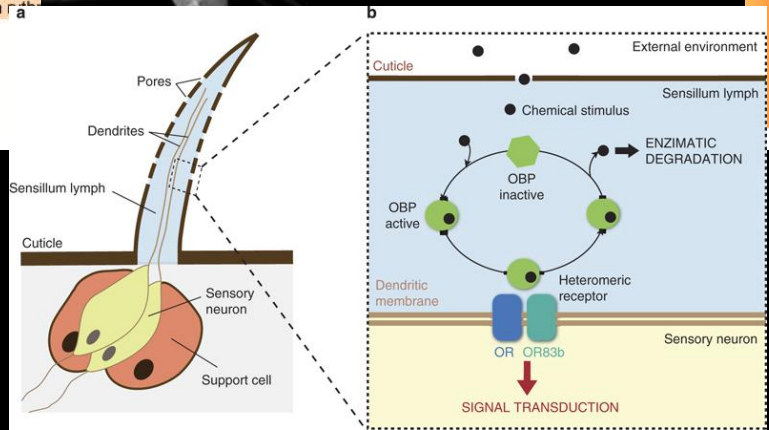
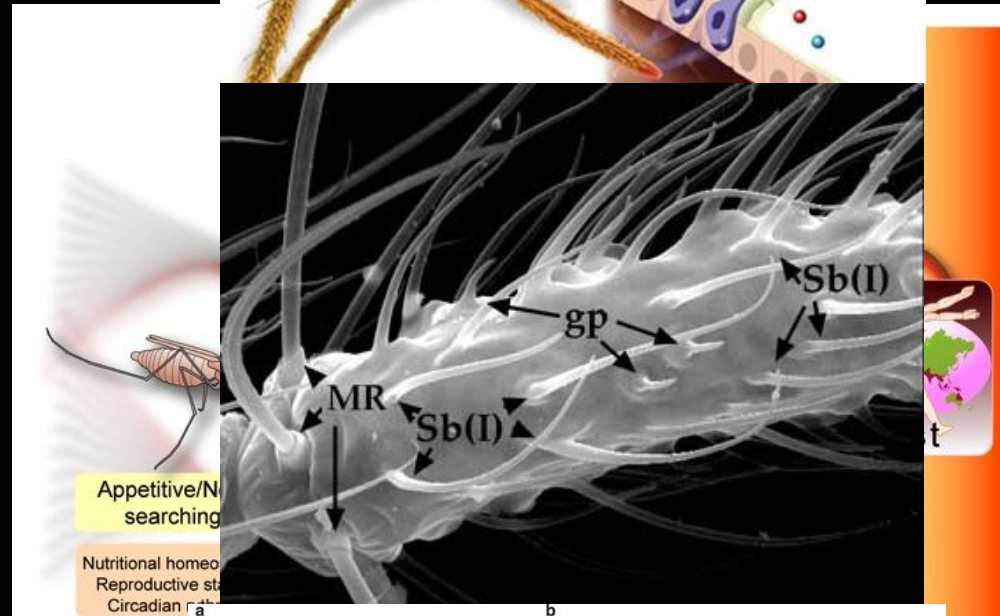
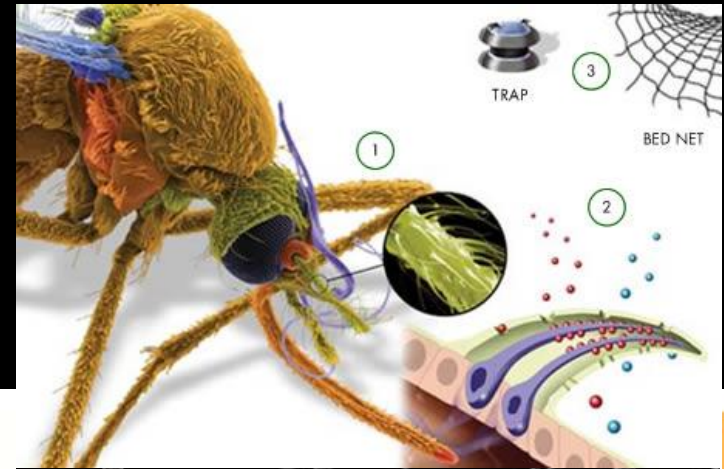
It all started with a conversation...



Can you use mosquitoes to detect leaky septic systems?

Mosquito olfaction

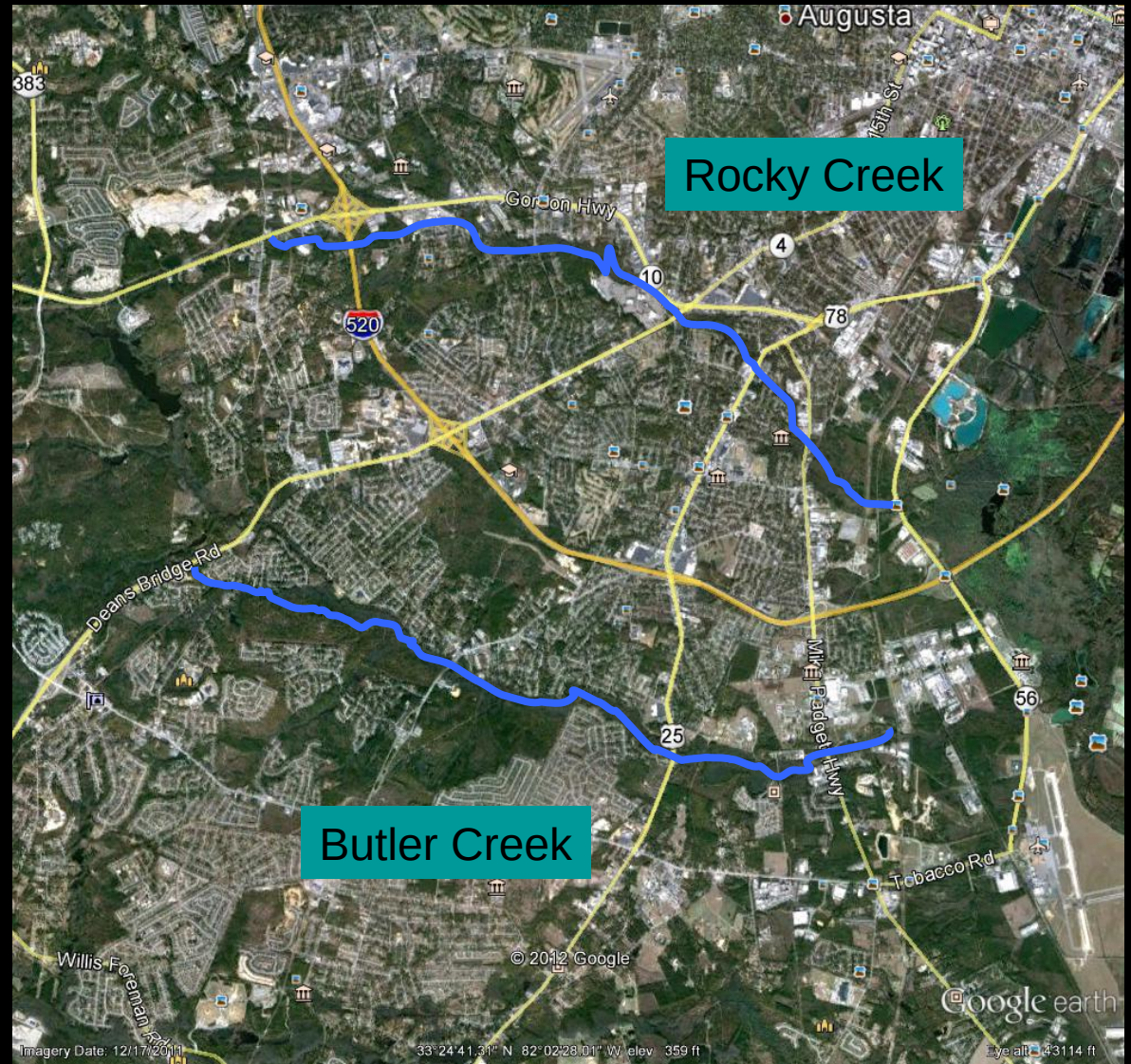
- Mosquitoes have separate specialized sensors and receptor signals for different compounds on the antennae and maxillary palps
- Each is used for different life cycle requirements
- Some of those receptors key on predominant odors in human urine and feces or “human volatiles”



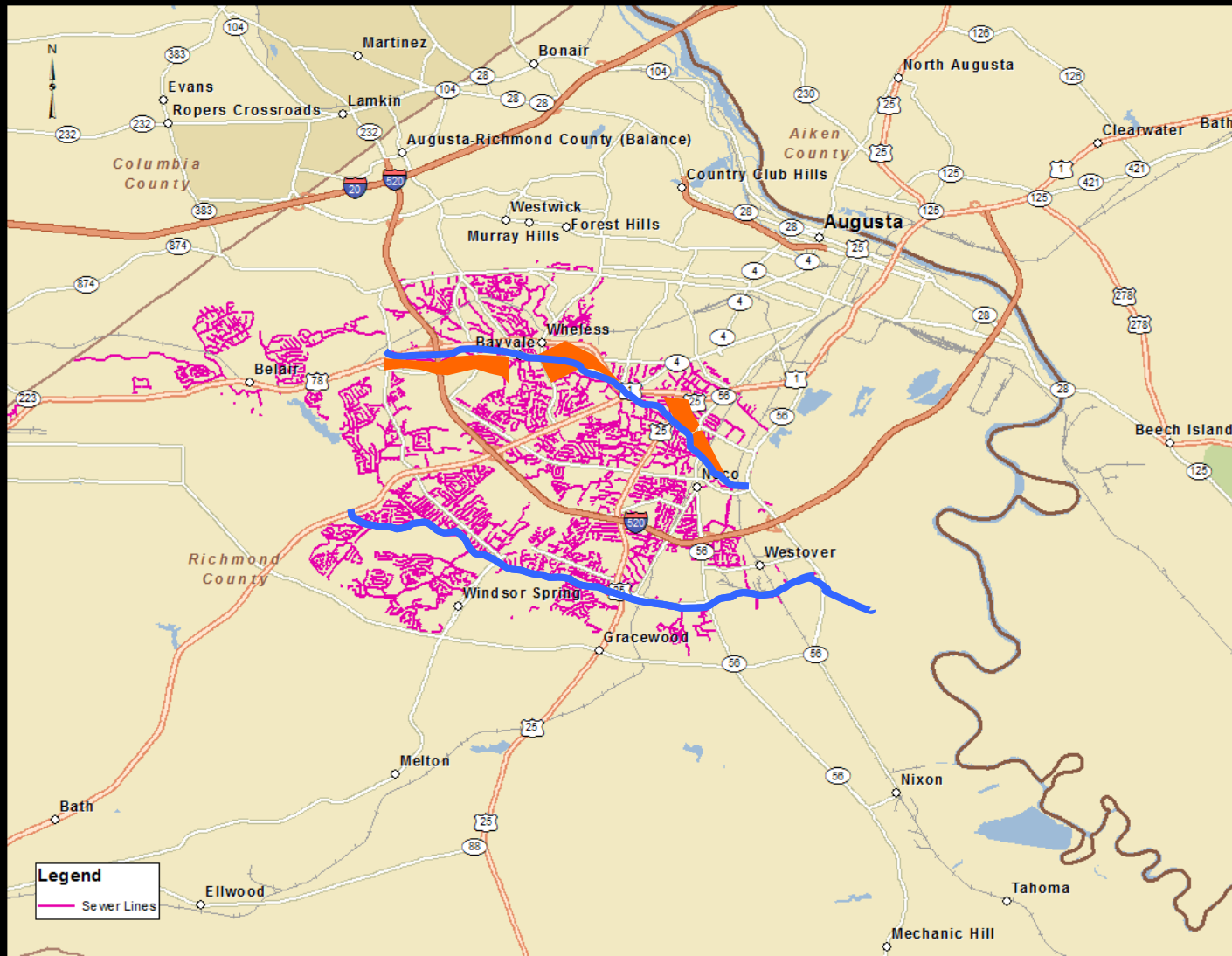
Fecal coliform study

- Determine sources of fecal coliform in 2 streams in Augusta (Butler Creek and Rocky Creek)
 - Use a Lagrangian approach (follow a packet of water)
 - Look for the obvious (broken septic systems, pet contributions, wildlife, broken pipes, etc.)
 - Understand the contribution from sediments and bacteria transported on sediment
- Need to know:
 - Concentrations of fecal coliform in streams
 - Location of septic systems

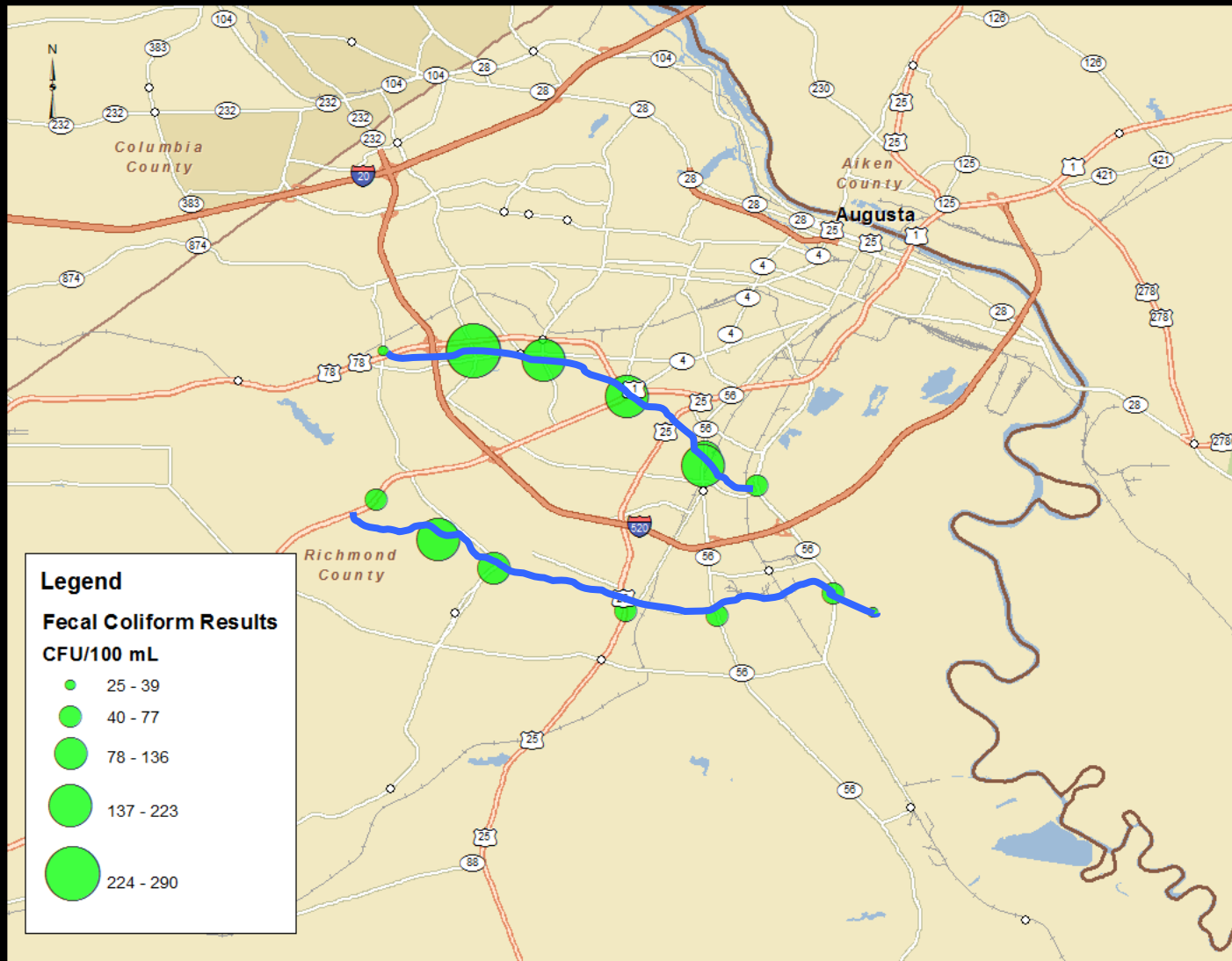
Study area



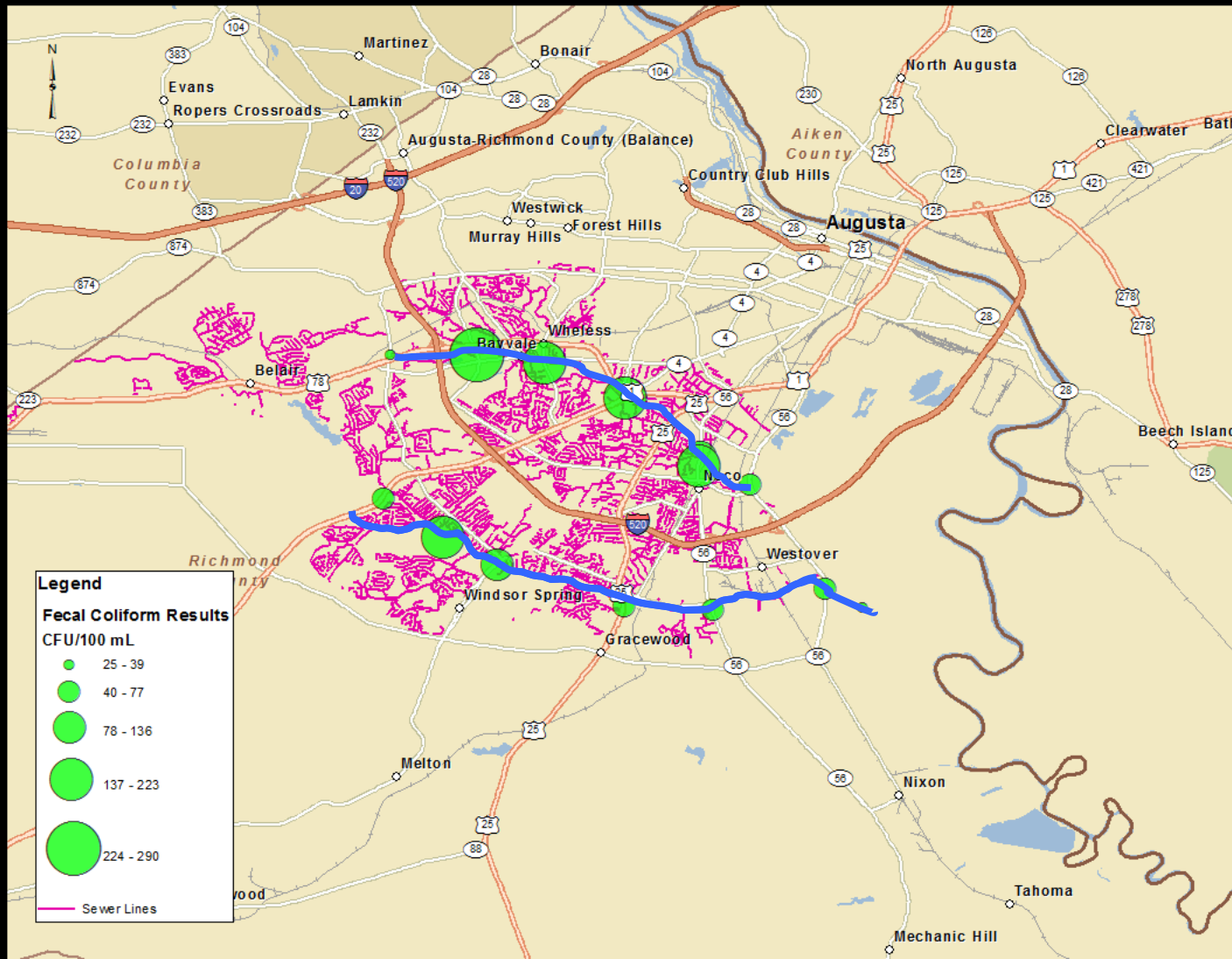
Location of sanitary sewer



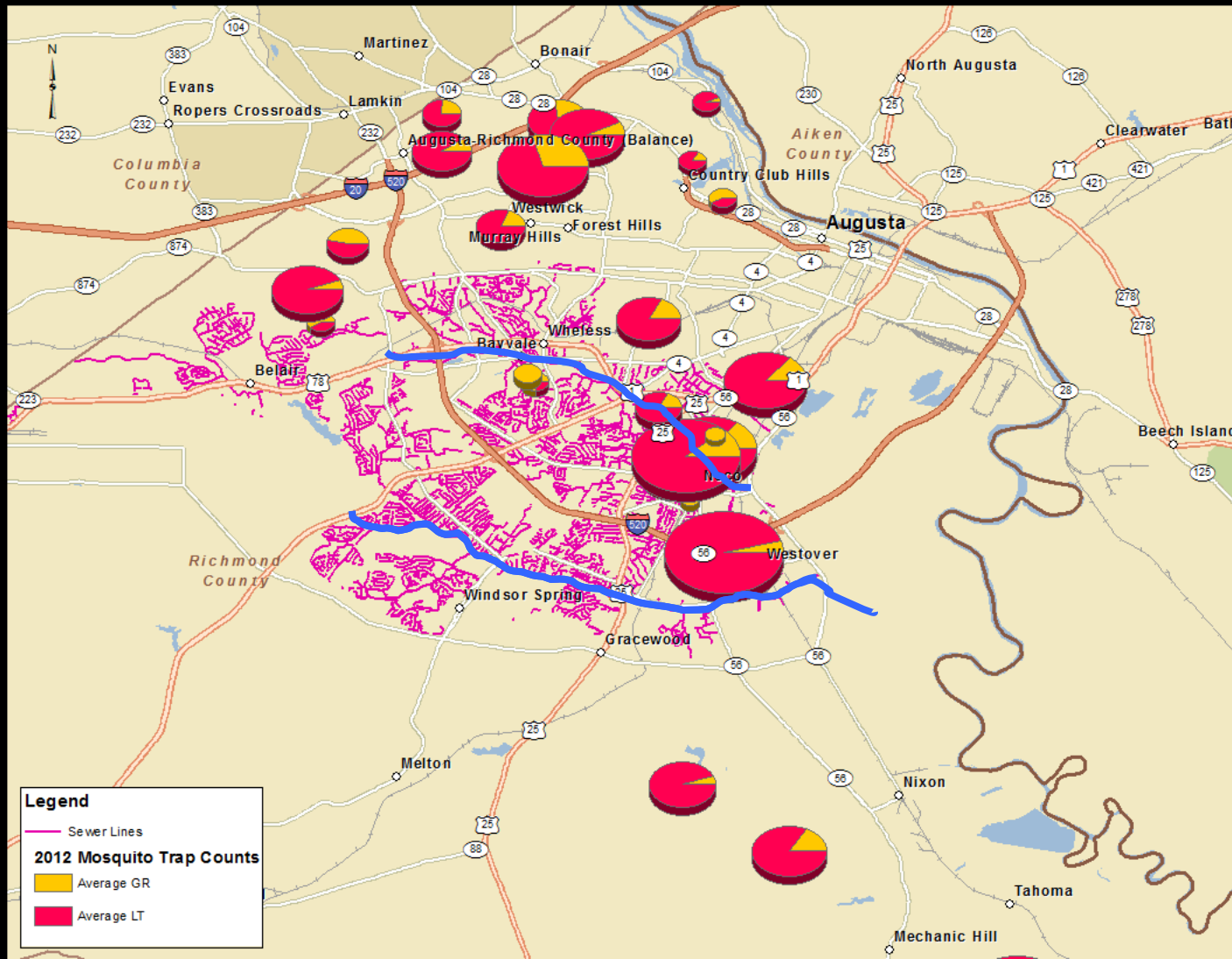
In-stream fecal coliform concentrations



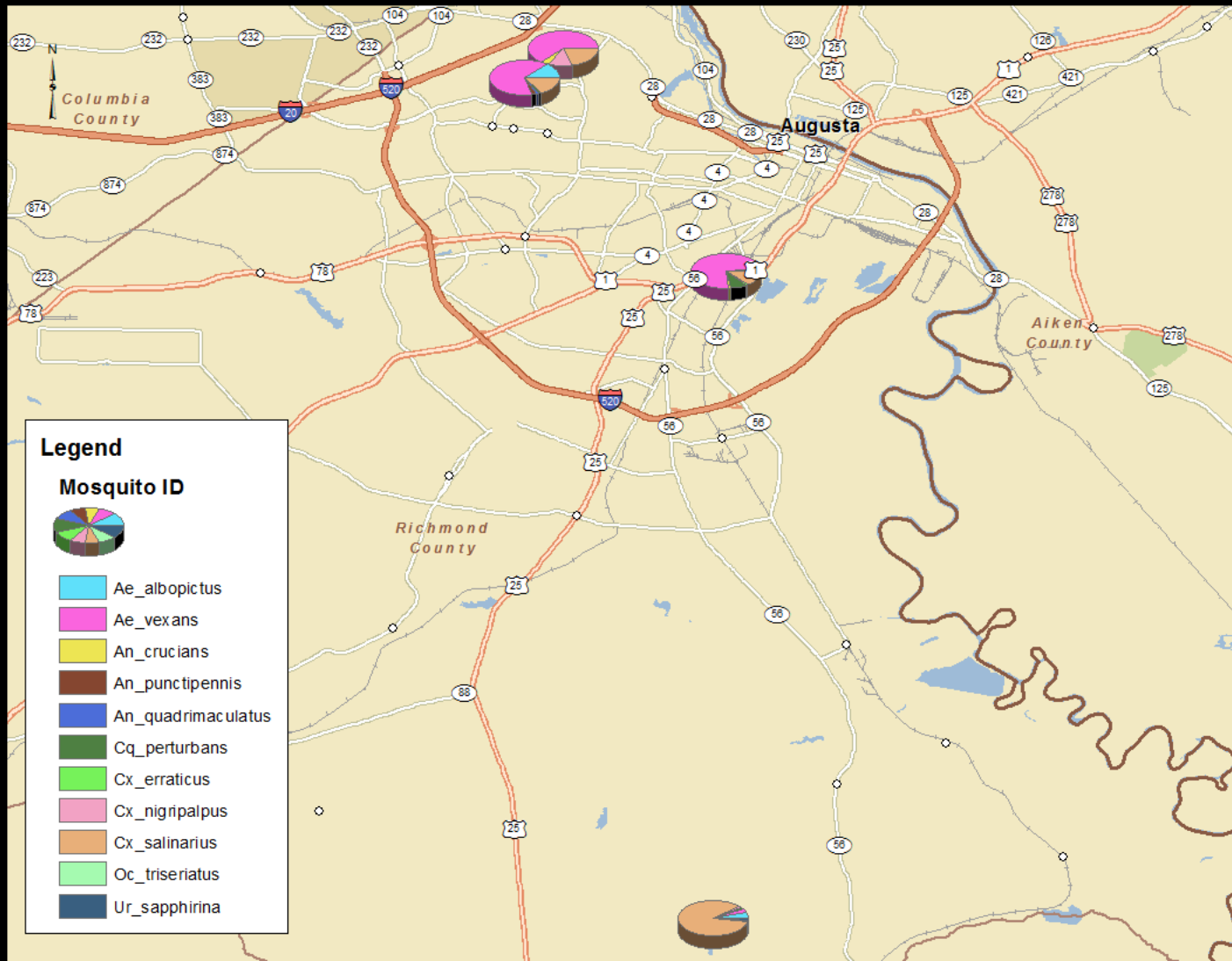
Fecal concentrations and sewer locations



Mosquito trap data



Mosquito IDs



Conclusions

- While mosquitoes have receptors for many odors, some of them are highly correlated with odors from human wastes.
- More work is needed but it looks promising thus far

Acknowledgements

- Our fecal coliform grant is funded by GAEPD and Augusta-Richmond County's Engineering Department
- Mosquito data was provided by Augusta-Richmond County's Mosquito Control Program
- Sanitary sewer location data was supplied by Augusta-Richmond County's Utilities Department
- Thank you to Rose Kelly for the species data
- Questions?