## DEVELOPMENT OF NEW MARKERS TO TRACK FECAL CONTAMINATION IN THE MAY RIVER



Water Quality Lab Tye Pettay August 22, 2024





# **BACTERIAL SOURCE TRACKING – MAY RIVER**



- Began in late 2016
  - Goal: identify source of bacteria
  - Establish mitigation plans
  - Monitor for "leaky" septic systems
- Detect:
  - Human fecal contamination
  - Livestock/pets
  - Wildlife
- Samples collected:
  - Monthly basis at DHEC sites (Shellfish)
  - Town of Bluffton
    - Wet & dry
    - MRWAP & MS4
- Began at USCB in July 2021



MST Sampling Location
Flowline

Town Jurisdiction

MICROBIAL SOURCE TRACKING LOCATIONS

**Town of Bluffton** 







# SOURCE SAMPLES



Animal	# Samples	Location	# Analyzed
Dog	11	Beaufort, Bluffton, Hilton Head, Summerville	10
Horse	14	Beaufort, Okatie, Claxton (GA)	13
Deer	9	Bluffton, Sheldon	9
Goose	14	Beaufort, Bluffton	14
Chicken	4	Okatie, Columbia	3
Duck	2	Bluffton	2
Pig	3	Okatie, Columbia	2
Donkey	2	Okatie, Columbia	1
Goat	3	Beaufort, Okatie, Columbia, Summerville	1
Bobcat	2	Shledon	0
River Otter	2	Sheldon	0
Rabbit	2	Beaufort, Columbia	0
Turkey	1	Sheldon	0
Woodstork	1	Sheldon	0
Cow	6	Yemassee, Summerville	0
Alpaca	1	Columbia	0
Cat	0	N/A	0
Total	77		55



#### **NEW MARKER RESULTS**



◆ Sensitivity ★ Specificity ● Accuracy



MST Marker	Positive	False Negative	Negative	False Positive	Sensitivity	Specificity	Accuracy
Dog	7	3	46	0	0.70	1.00	0.95
Horse	11	2	41	2	0.85	0.95	0.93
Deer	7	2	47	0	0.78	1.00	0.96
Bird	7	12	12	0	0.37	1.00	0.61

### **NEXT STEPS**

- Discuss locations to begin using new markers on a regular basis
- Retroactively analyze previous samples with high contamination not attributed to human sources
- Continue screening markers from additional animal sources
- Develop additional new markers
  - Optimization
  - Newly designed (i.e., cat)
- Publish results
  - Screening of new markers
  - Long-term MST data for the May River





### **QUESTIONS?**











