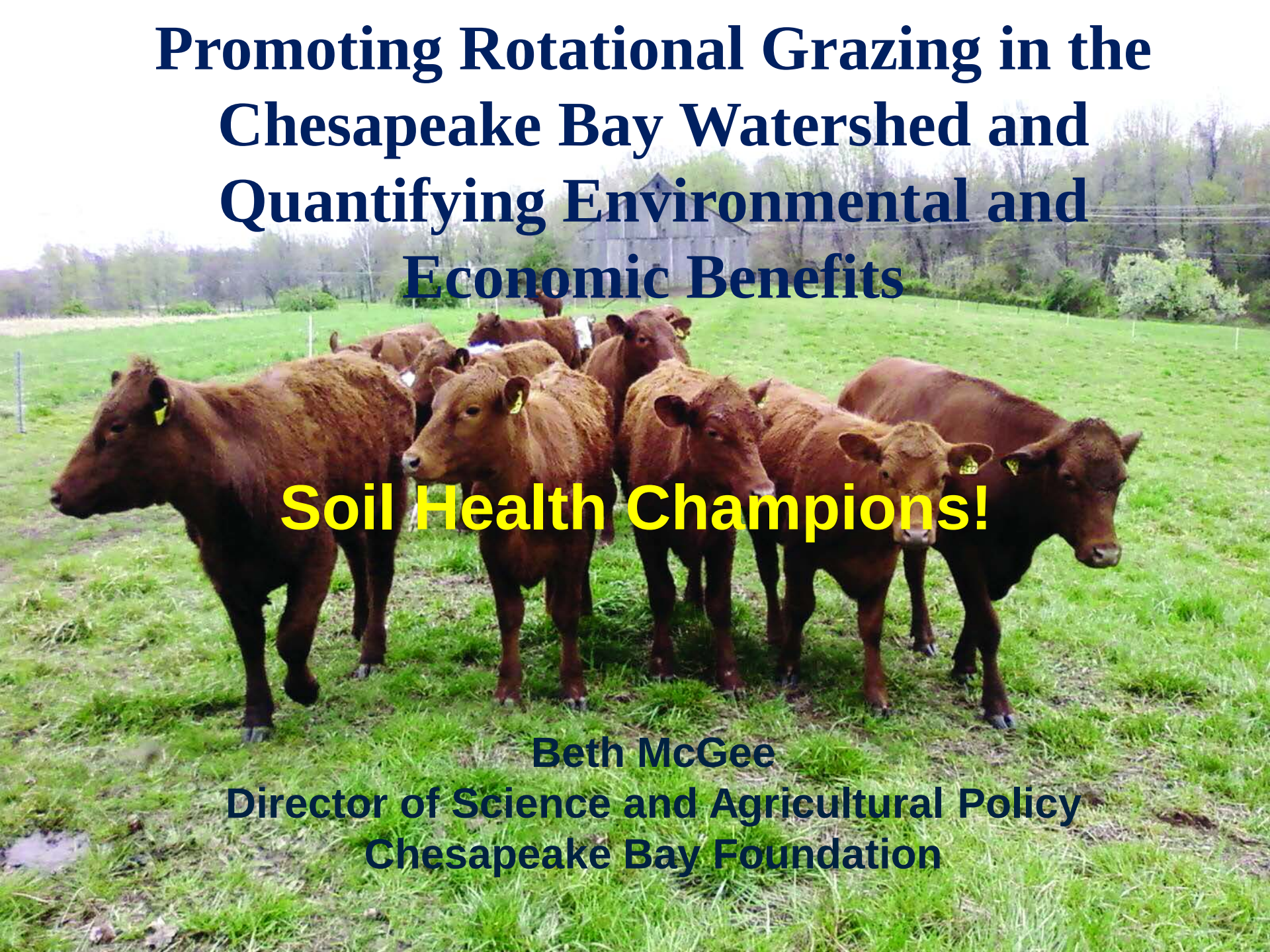
Promoting Rotational Grazing in the Chesapeake Bay Watershed and Quantifying Environmental and Economic Benefits



Soil Health Champions!

Beth McGee
Director of Science and Agricultural Policy
Chesapeake Bay Foundation

- Virginia Forage & Grassland Council
- Capital Resource Conservation & Development Area Council (PA)
- Future Harvest/Chesapeake Alliance for Sustainable Agriculture
- University of Maryland
- Red Barn Consulting
- World Resources Institute
- Texas Institute for Applied Environmental Research

CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

Promoting rotational grazing

- "Before and after" scenarios for 8 farms
  - Greenhouse Gases: Comet-Farm & A-Microscale (ACR – GLLM methodology)
  - Water Quality: Chesapeake Bay Nutrient Trading Tool (modified version of NTT)
  - Soil Health: Cornell Soil Health Testing Lab
  - Economics: UMD Economist
- Leveraging the "Carbon Reduction Fund"
  - WGL Energy Carbon Offsets/Sterling Planet

Case Study Farms

Group	Indicator	Value	Rating	Constraints
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**11.4**	**10**	**Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff**
biological	Organic Matter	**2.5**	**5**	**Nutrient and Energy Storage, Ion Exchange, C Sequestration, Water Retention**
biological	Soil Respiration	**0.5**	**35**	
chemical	Soil pH	**6.7**	**100**	
chemical	Extractable Phosphorus	**48.2**	**9**	**High Phosphorus, Environmental Impact Risk**
chemical	Extractable Potassium	**291.4**	**100**	
chemical	Minor Elements Mg: 176.1 / Fe: 1.9 / Mn: 16.0 / Zn: 1.6		**100**	

Overall Quality Score: **51** / Medium

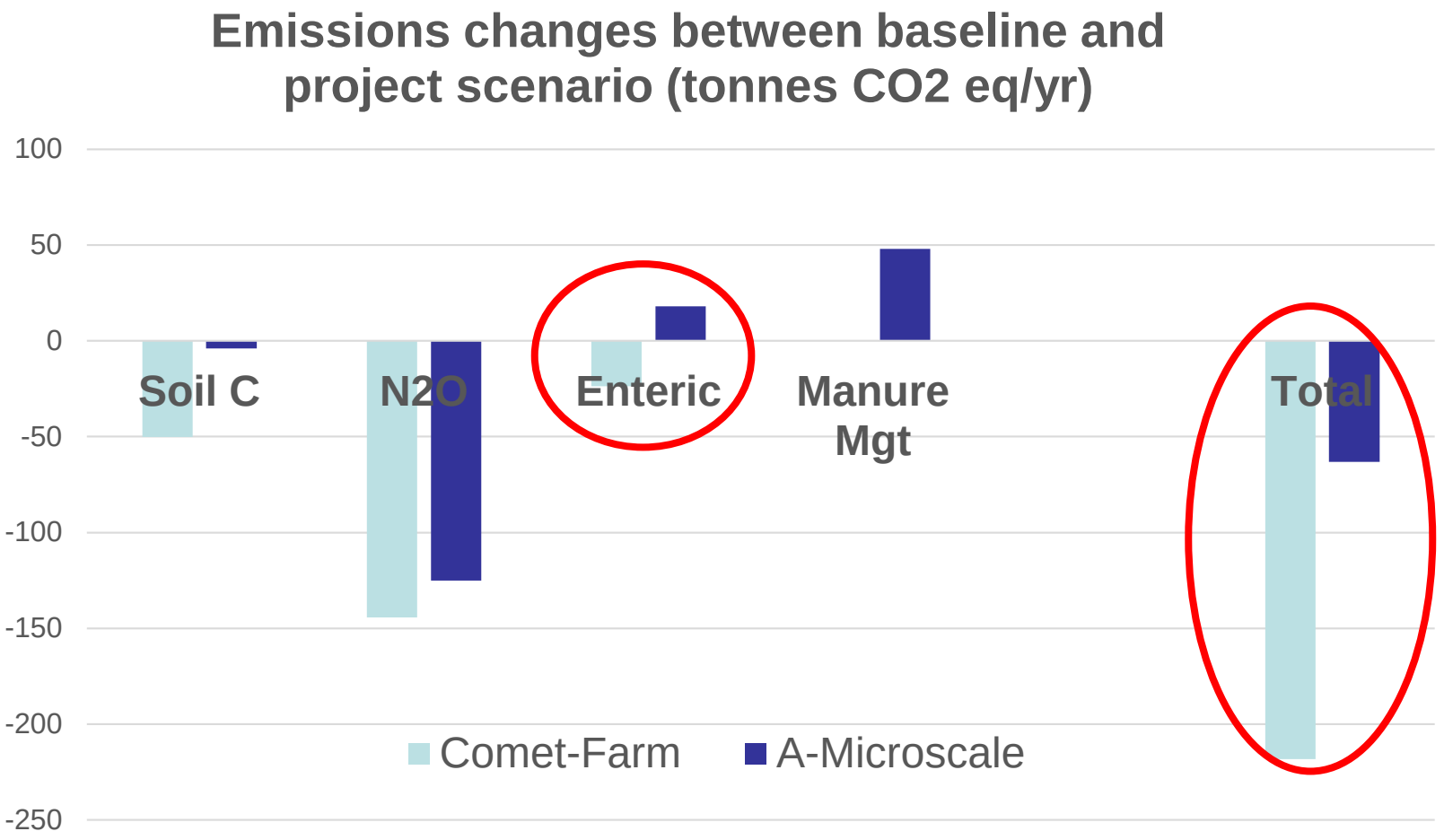
Case Study Farm 1

- 198 acre dairy farm in PA
- Baseline:
  - 90 acres in cropland – alfalfa, corn, rye
  - 37 acres rotational grazing/pasture
  - Use of manure and fertilizer on all fields
- Project:
  - 40 acres in cropland
  - 87 acres in rotational grazing
  - No commercial fertilizer

Case Study Farm 1

- 100 milking cows, 96 in project scenario; roughly 22 dry cows and 50 calves
- Diet transition to more grass, less grain/corn.
- Manure handling: slurry pit; then slurry pit and dry stacking in project scenario.
- Milk production increased in project scenario

How do GHG model results compare?



Closing thoughts…

- Sensitivity analysis of model inputs (even qualitative) would be useful, especially around diet choices
- Explanation of differences in enteric emissions estimates between Comet-Farm and A-Microscale worth exploring
- Comet-Farm inputs very similar to CB-NTT. Assumptions well documented, though not readily available. Field scale info is insightful. Ability to save different scenarios would be useful.
- A-Microscale is somewhat less data intensive, but a little clunky. Results relatively consistent with Comet-Farm.
- Obvious trade-off of simplicity vs complexity