

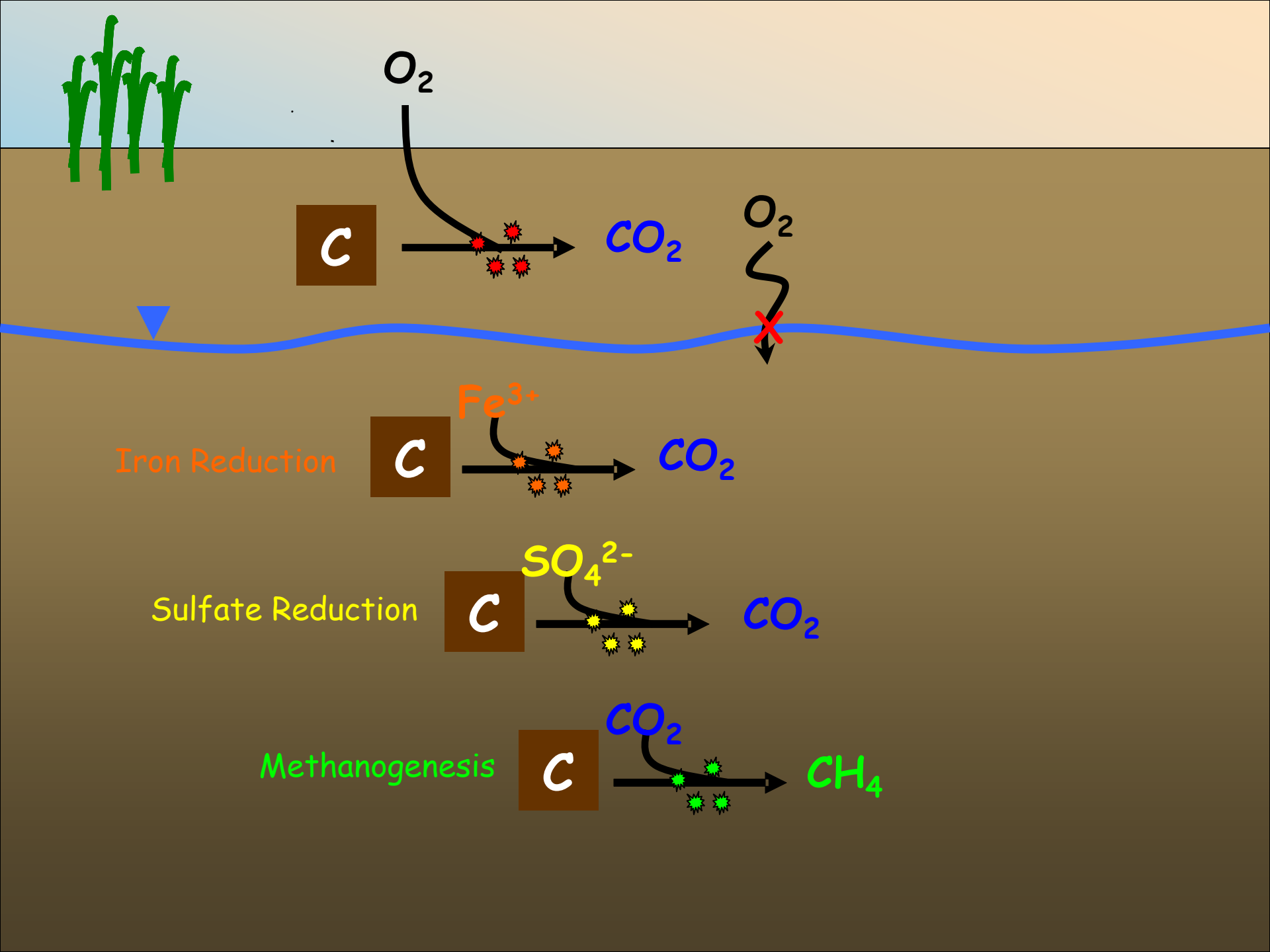
The role of humic substances as terminal electron acceptors in peatland decomposition

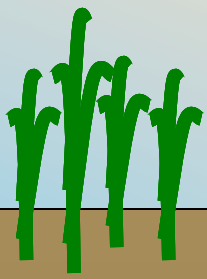
Jason K. Keller

Kimberly K. Takagi and Crisand Anderson



CHAPMAN
UNIVERSITY





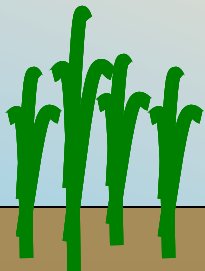
The Peatland Gradient

Ombrotrophic Bog

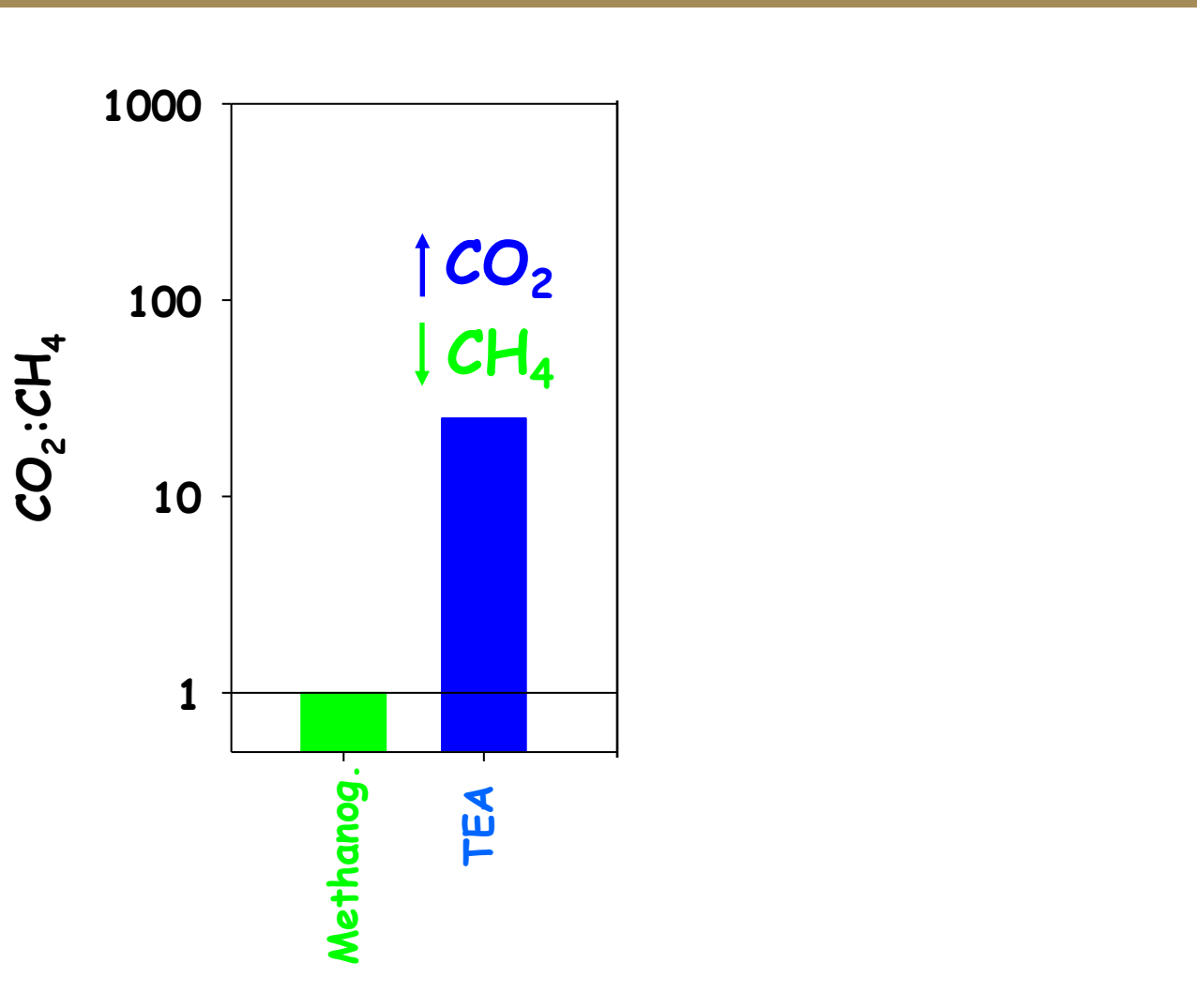


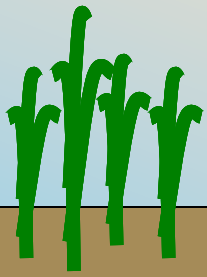
Minerotrophic Rich Fen



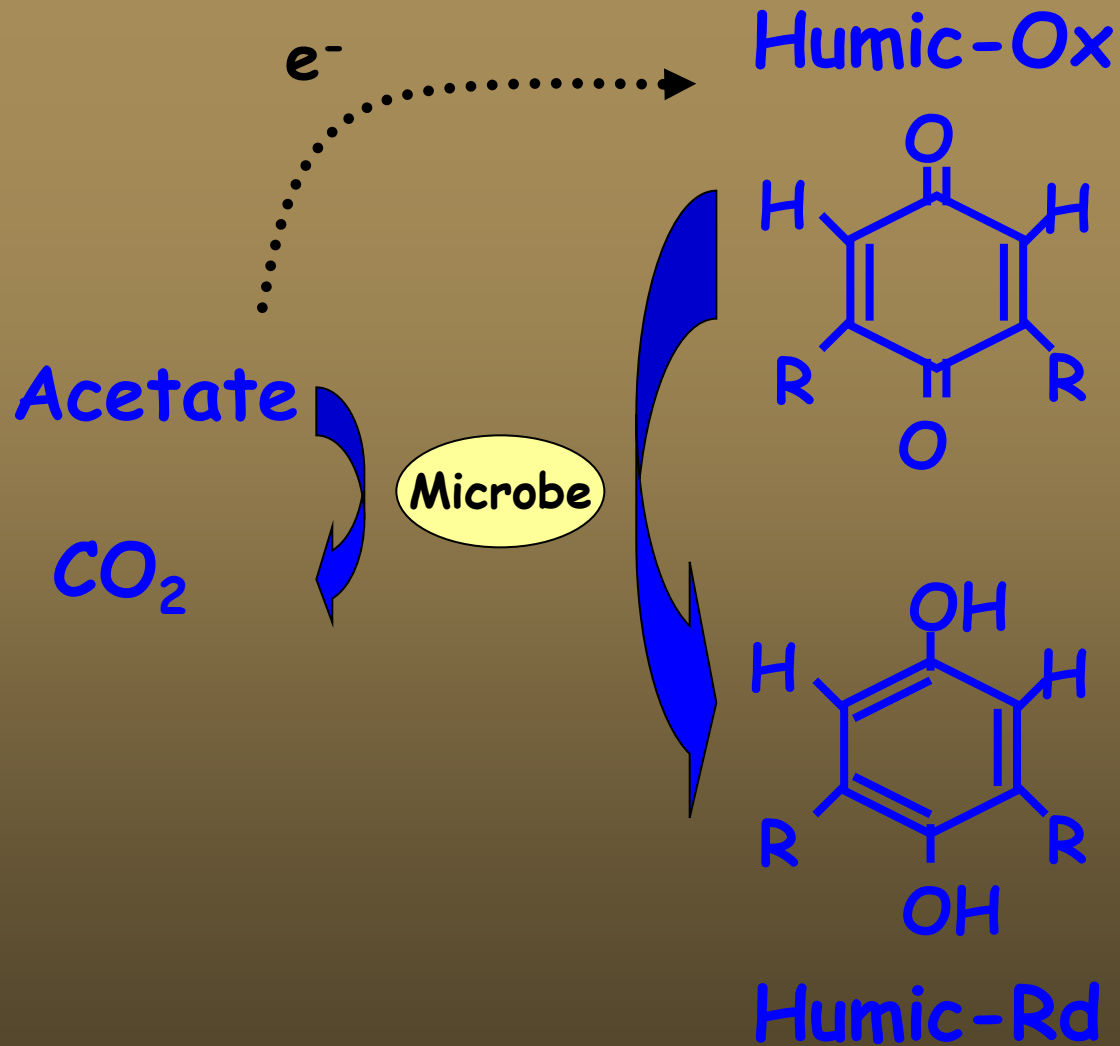


CO₂:CH₄ Ratios

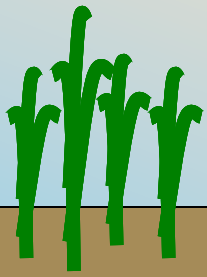




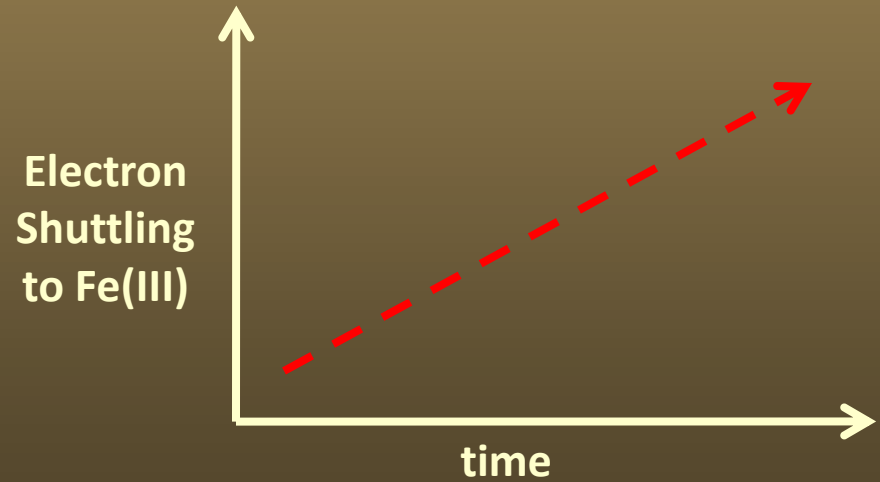
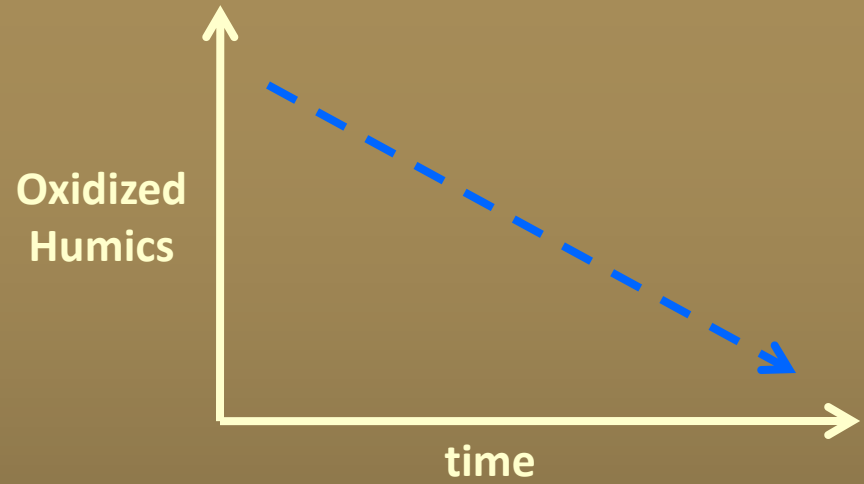
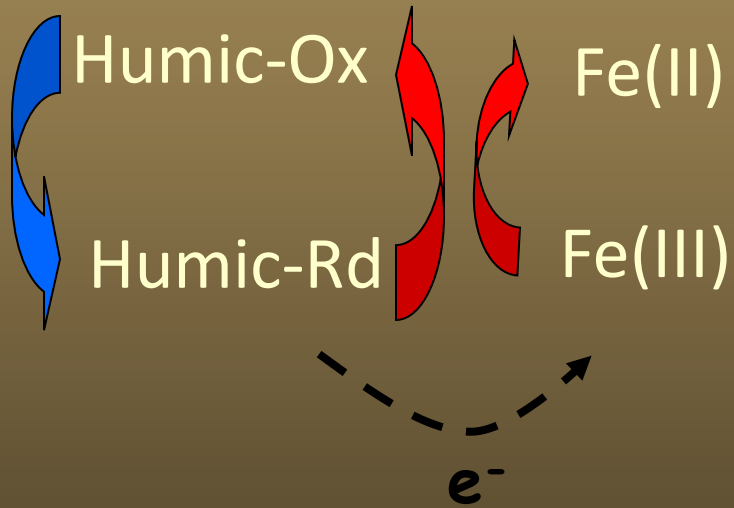
Humic Substance Reduction



~~CH₄~~

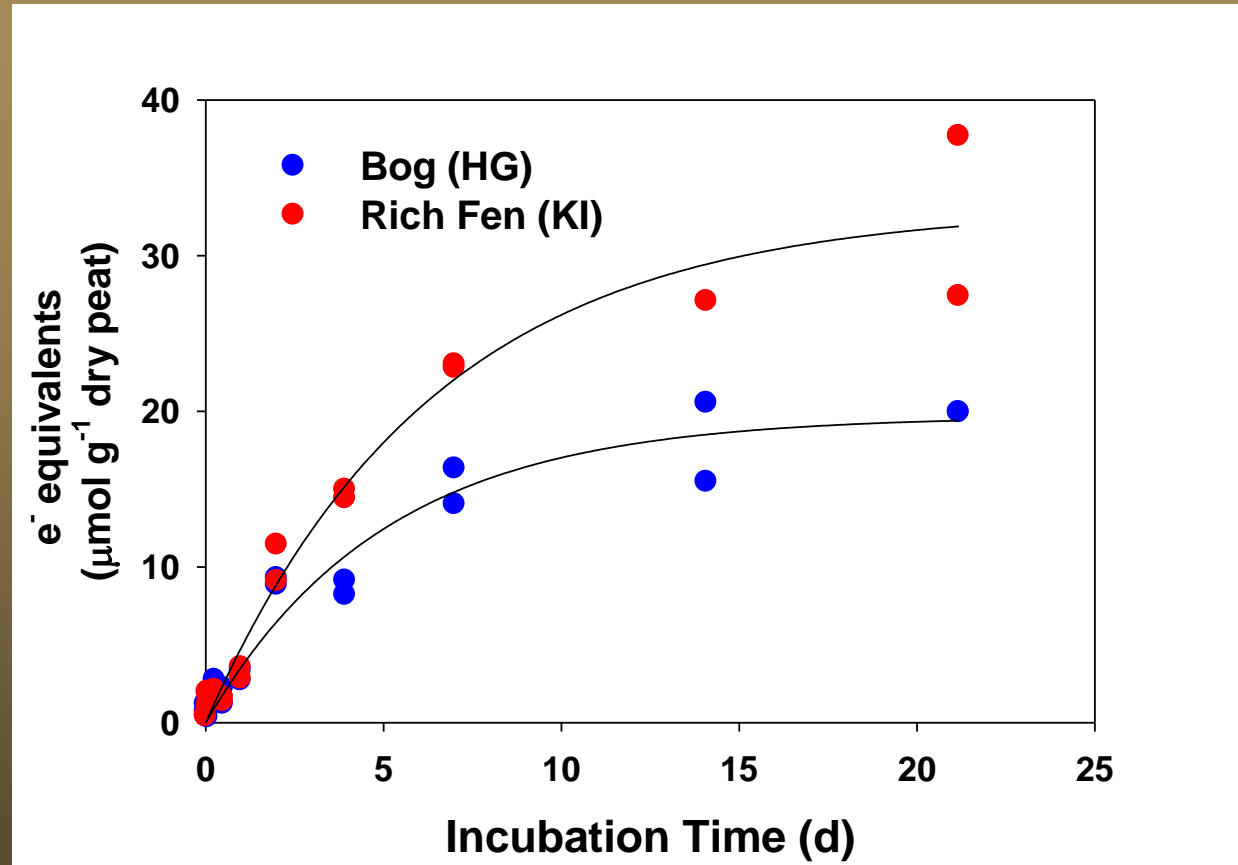
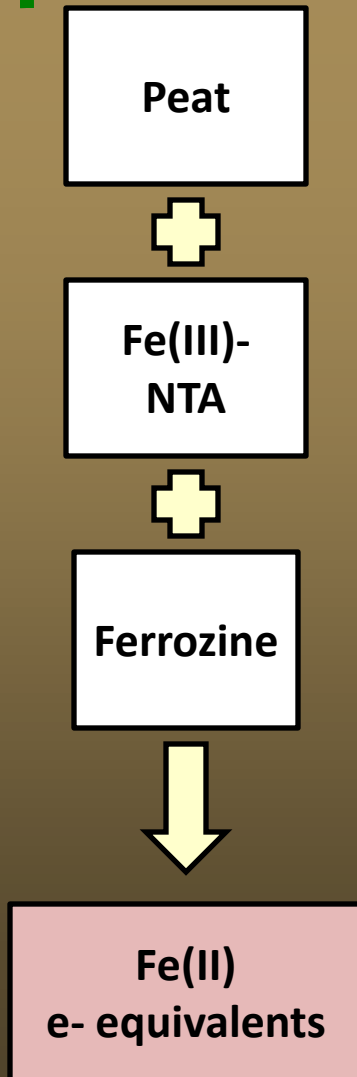
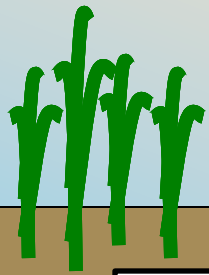


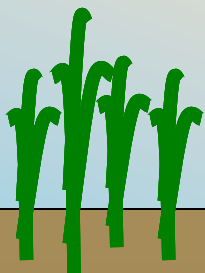
Quantifying Humic Reduction



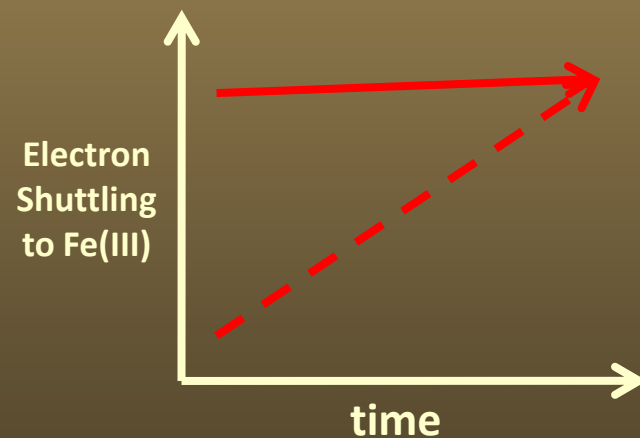
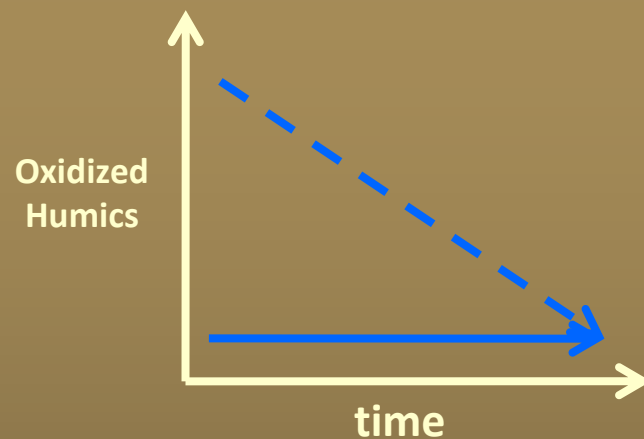
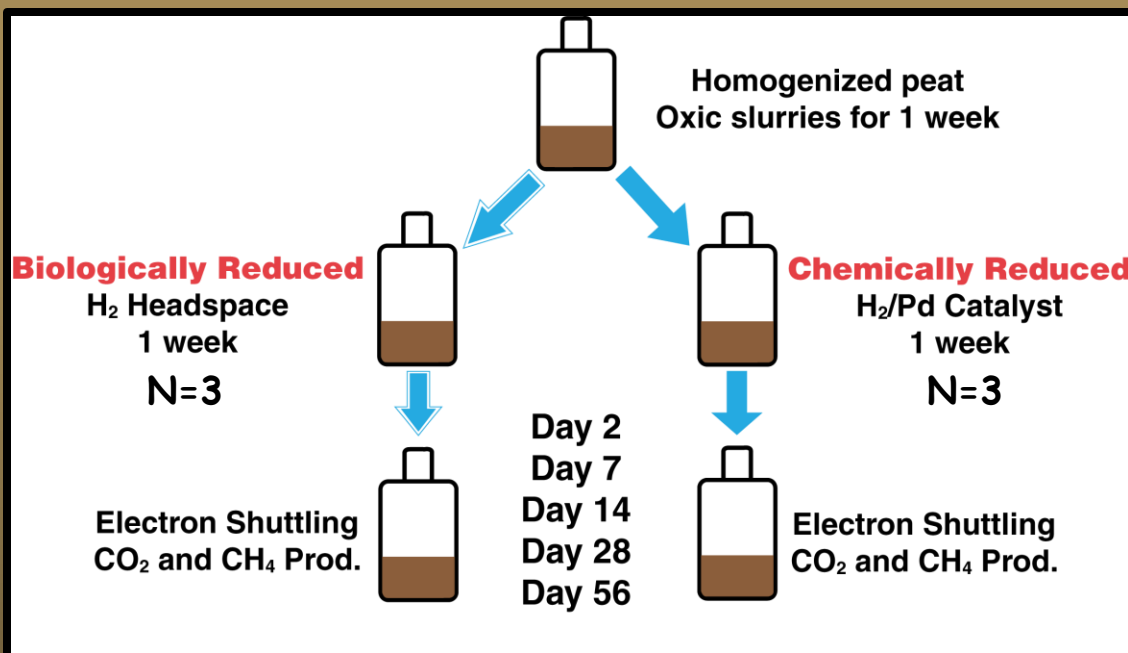
Electron Shuttling Assay

Chemical Reduction (Pd/H₂)

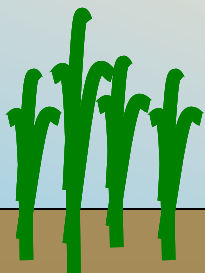




Survey - Methods

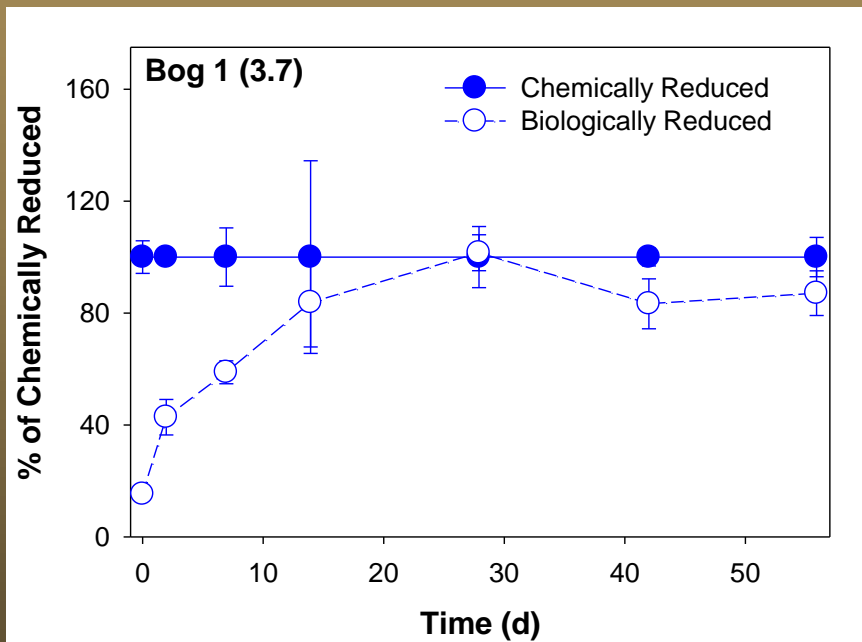


Bog 1 3.7	Bog 2 3.8	Poor Fen 4.2	SPRUCE 4.1
Int. Fen 4.8	Cedar Sw. 5.9	Rich Fen 6.0	

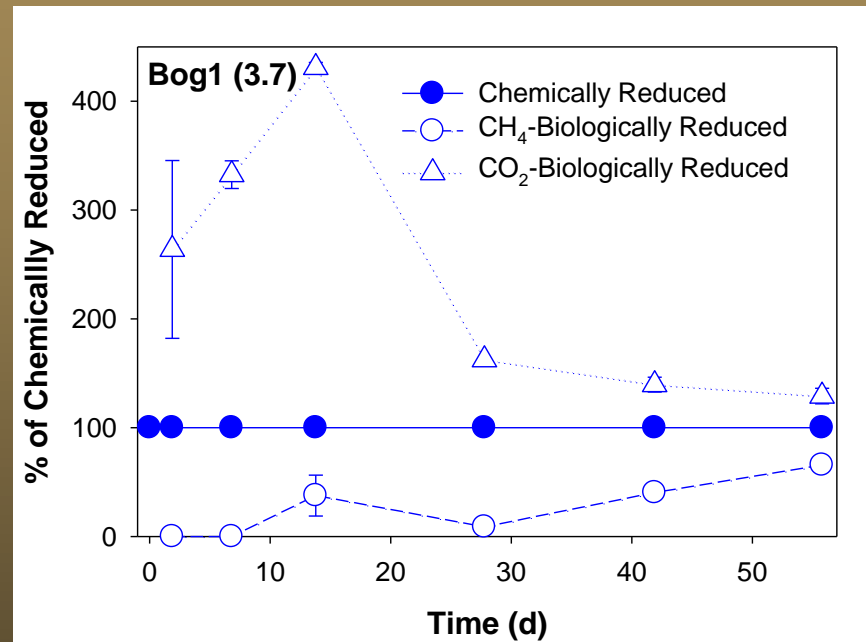


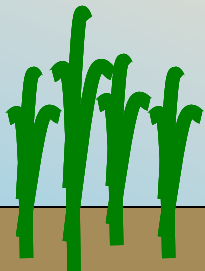
Bog 1 Soil

Electron Shuttling



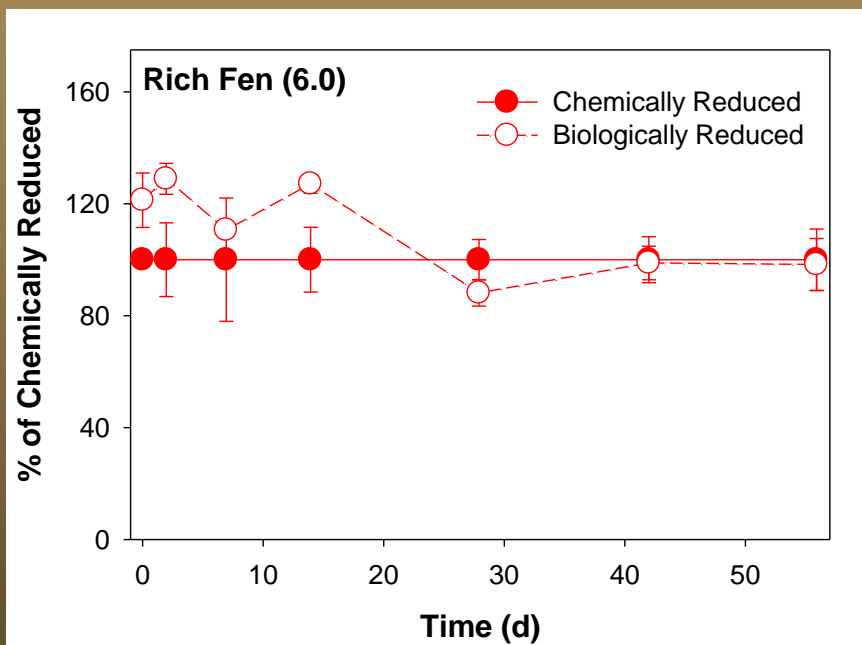
CH₄ and CO₂ Production



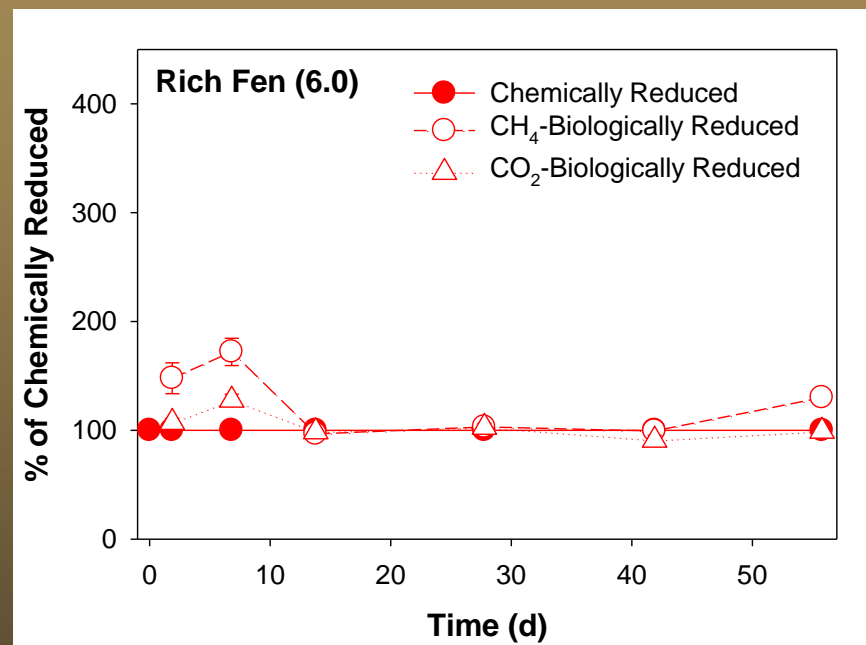


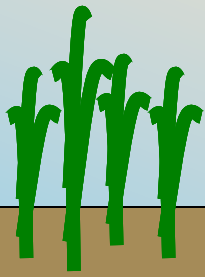
Rich Fen Soil

Electron Shuttling

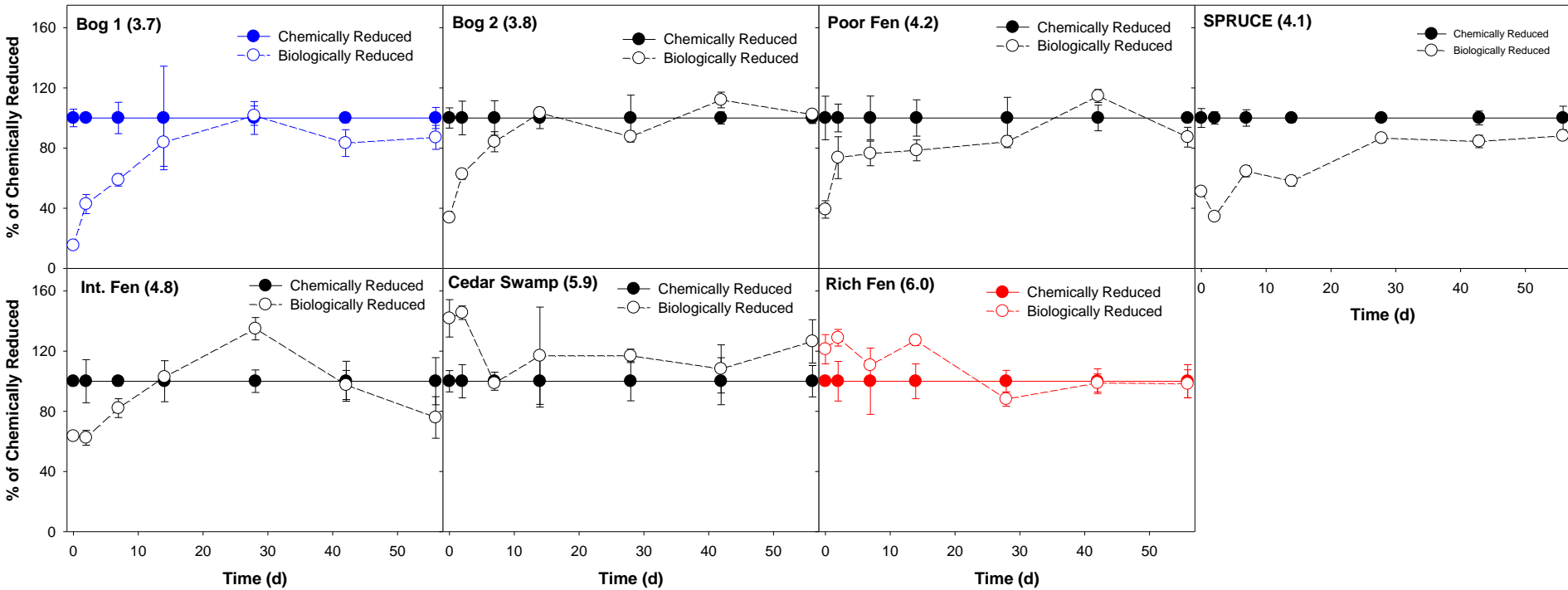


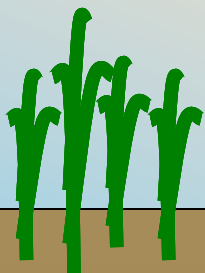
CH₄ and CO₂ Production



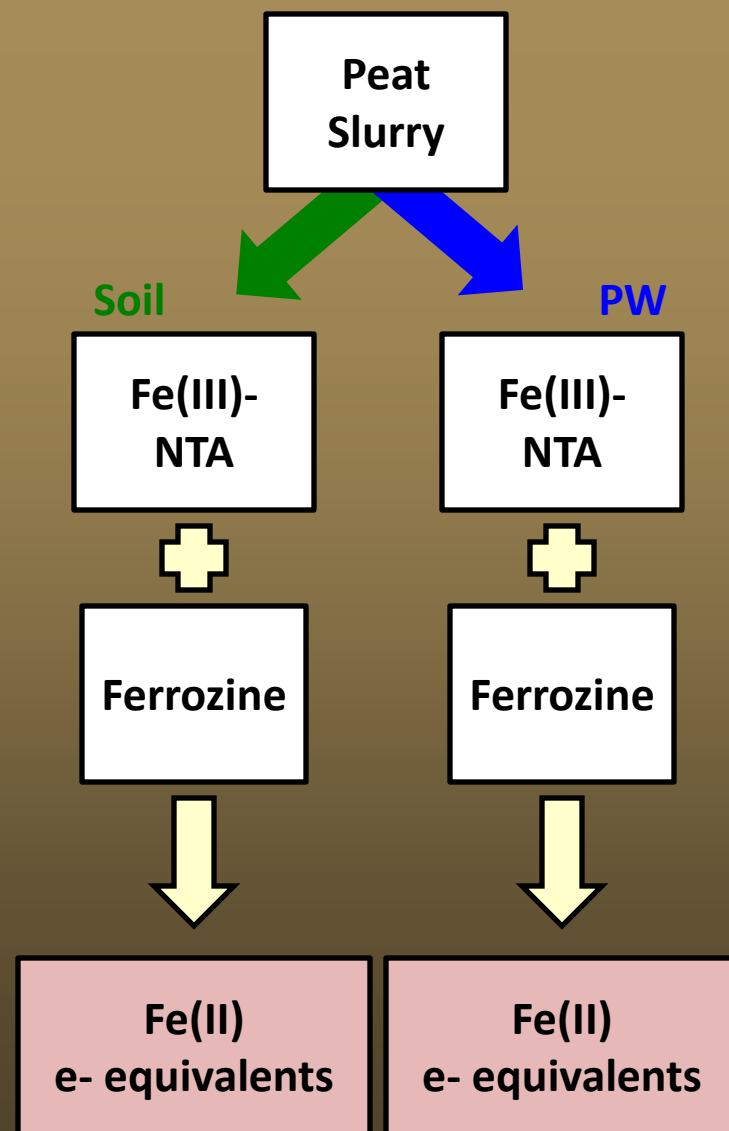
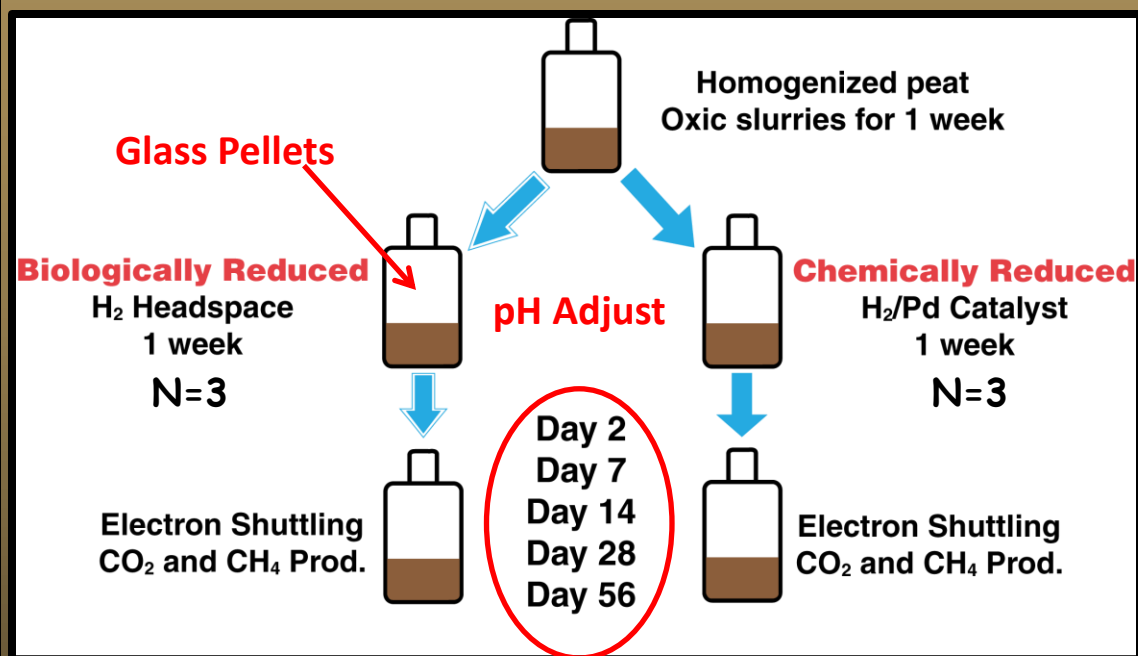


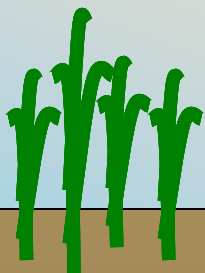
Survey - Electron Shuttling





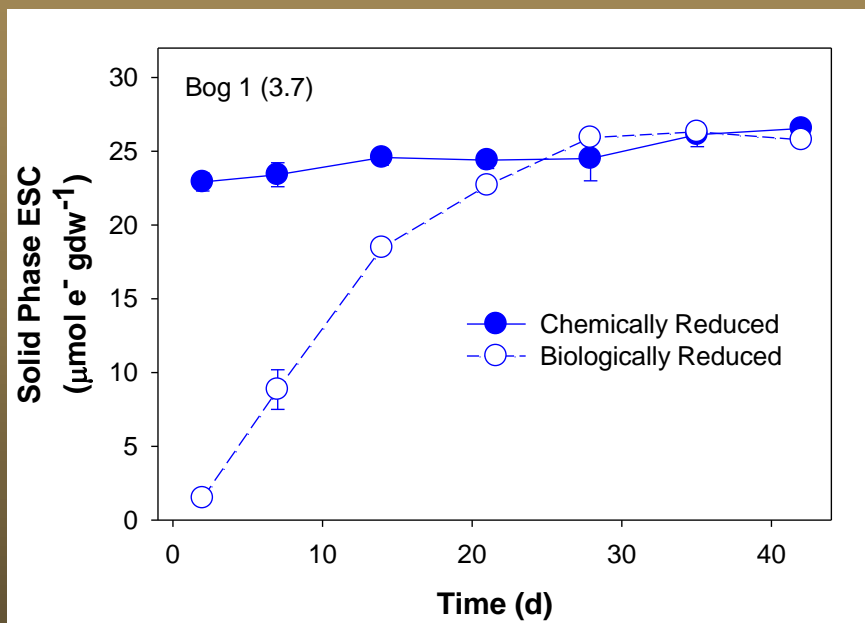
Revised Methods



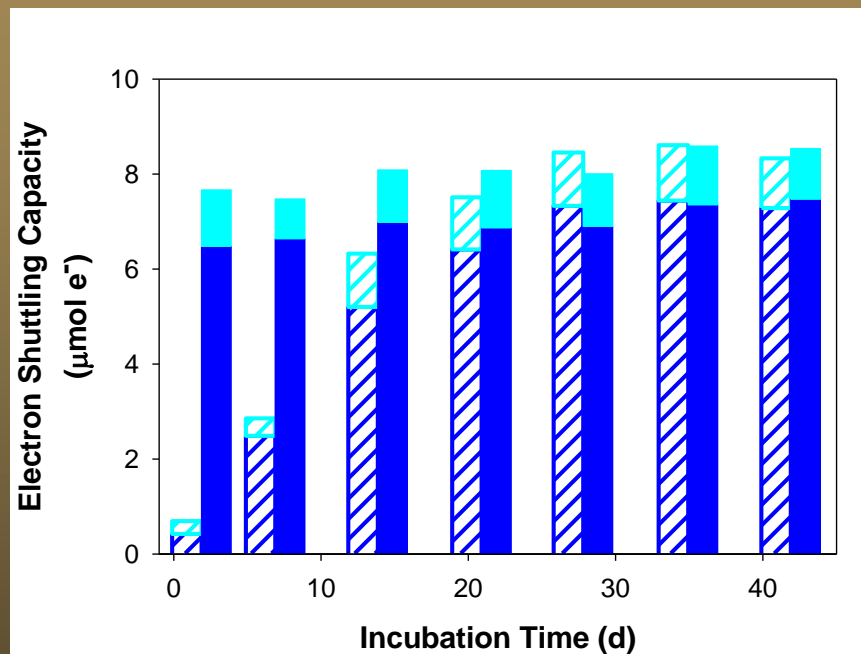


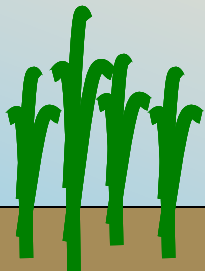
Bog 1 Soil

Electron Shuttling



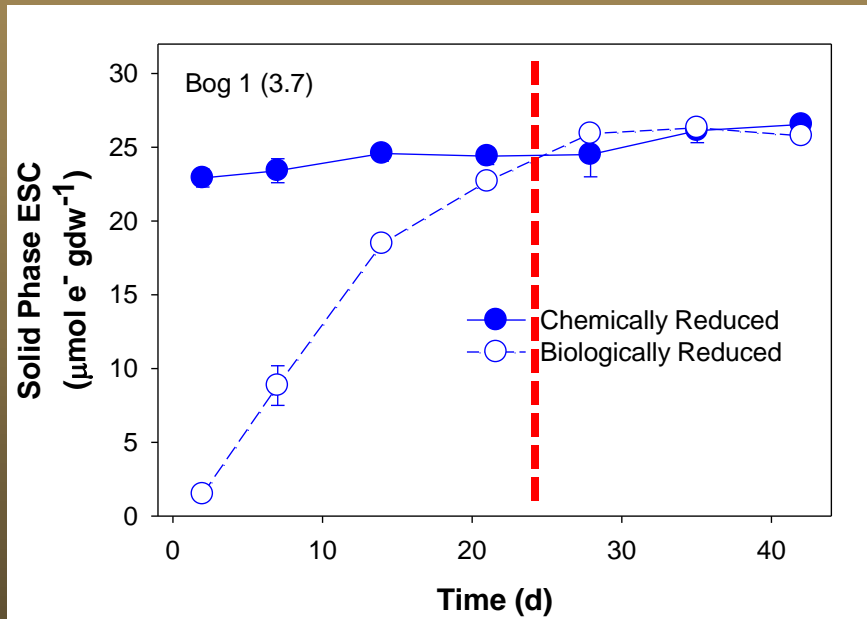
Solid Phase vs. Dissolved



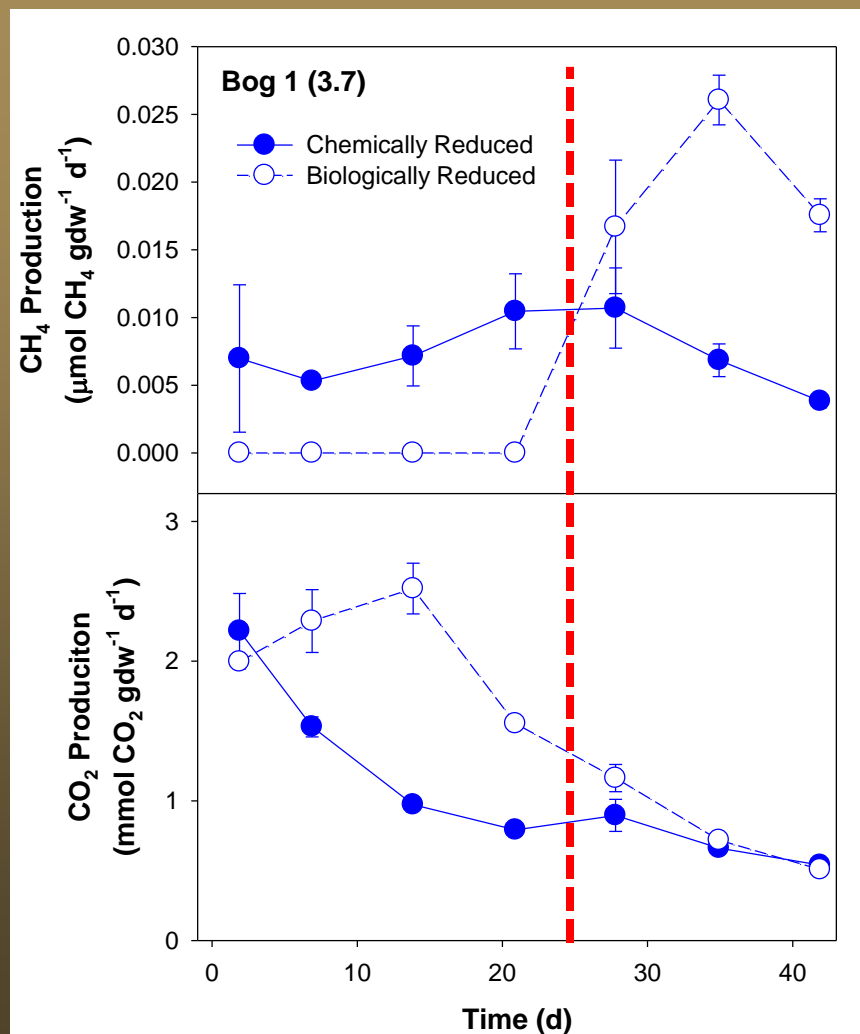


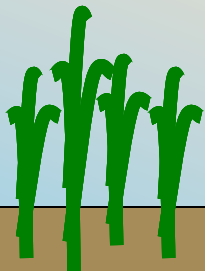
Bog 1 Soil

Electron Shuttling



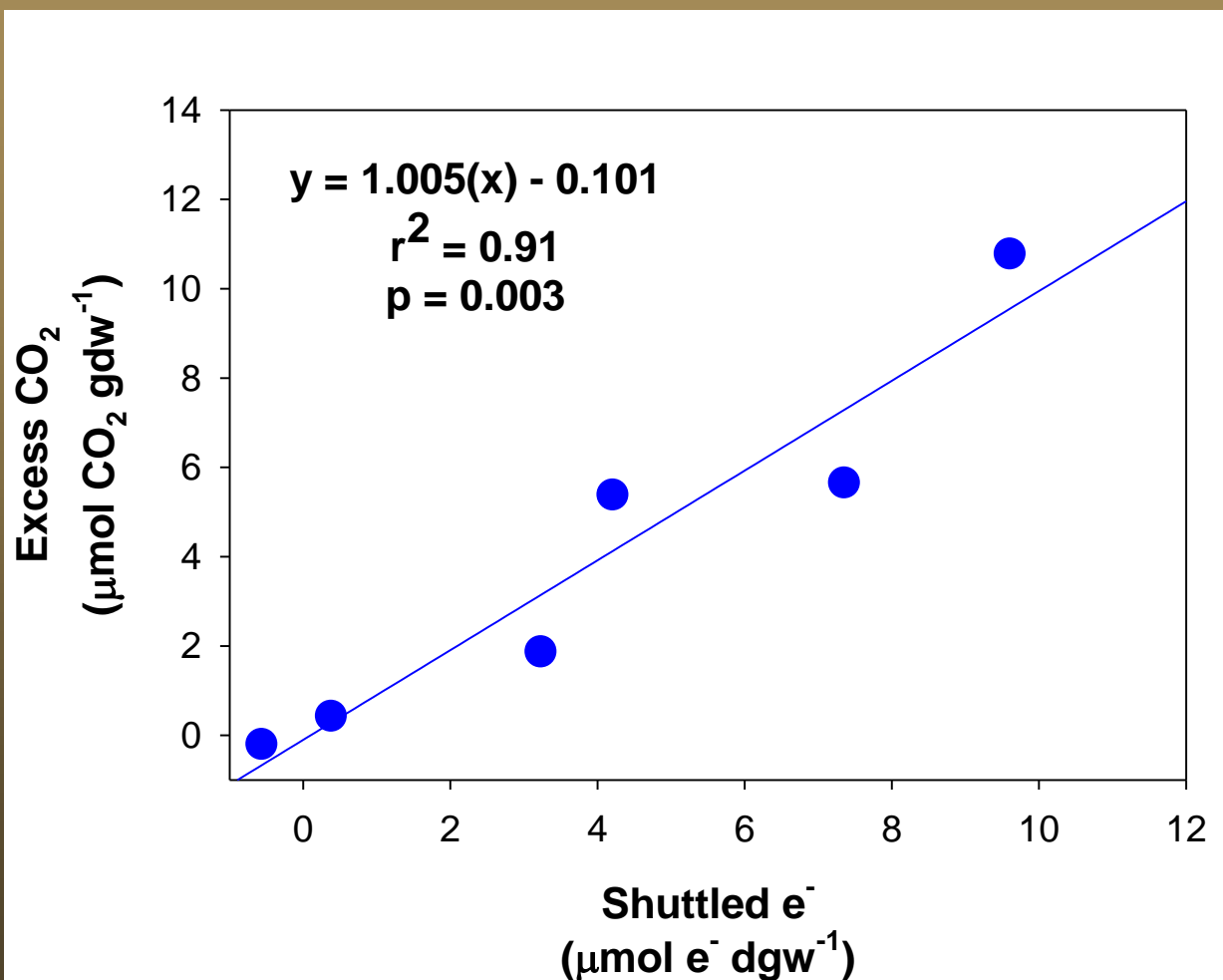
CH₄ and CO₂ Production



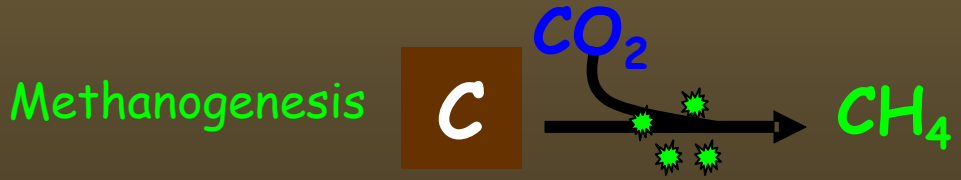
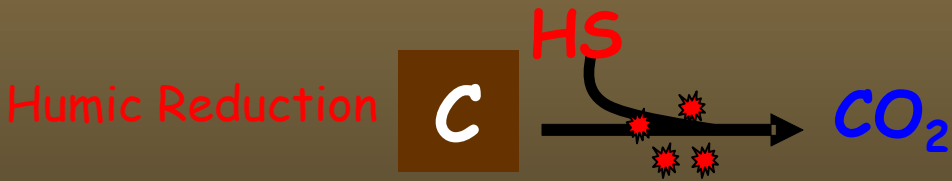
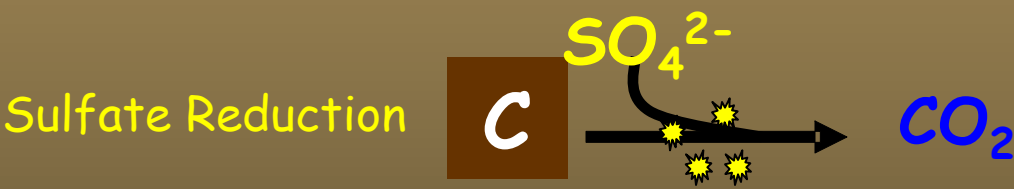
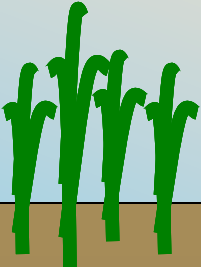


Bog 1 Soil

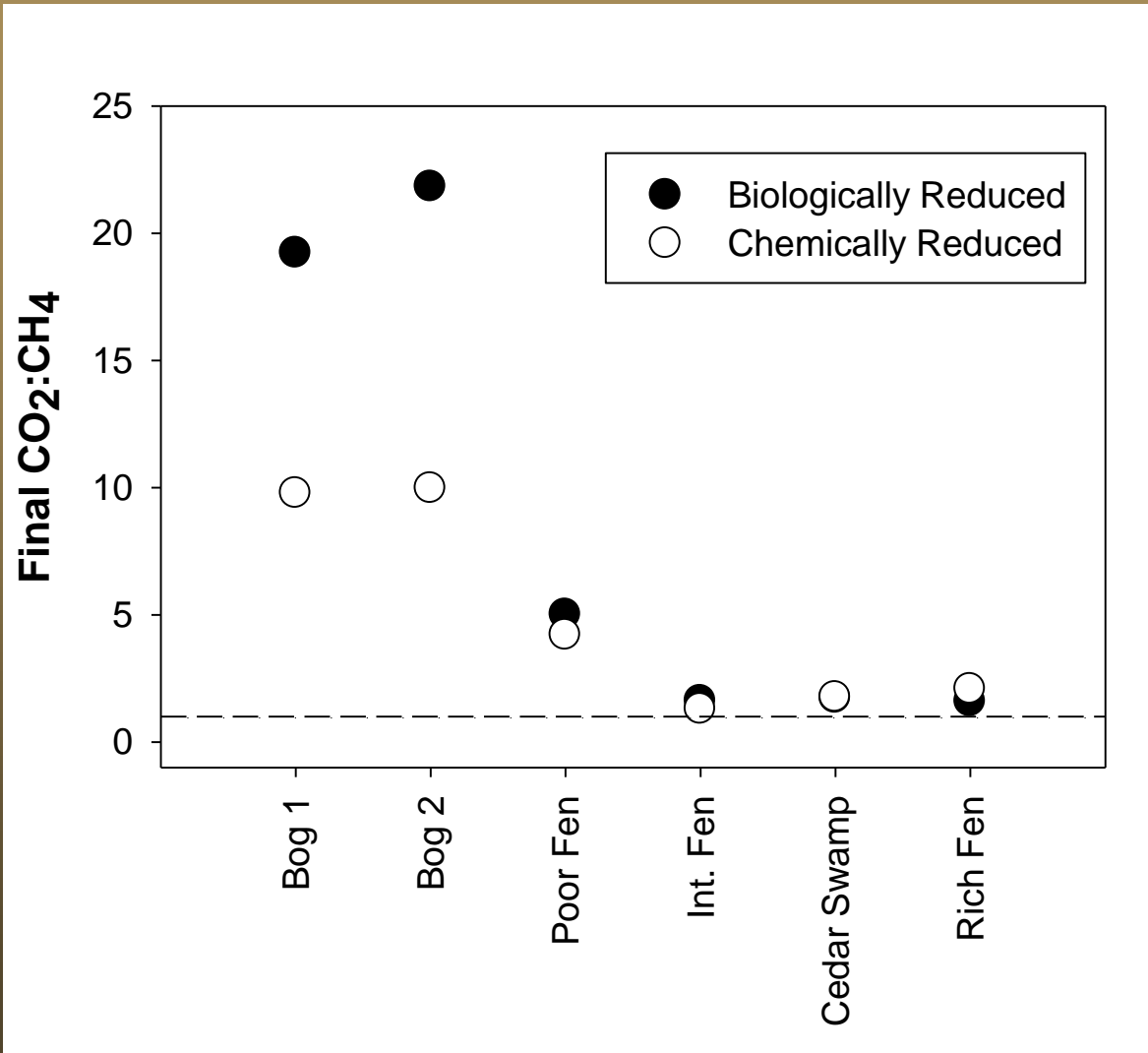
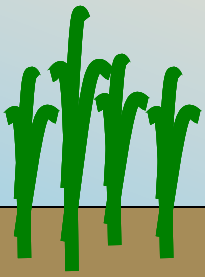
Excess CO_2 Explained by Electron Shuttling

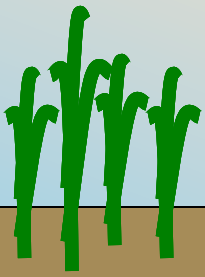


Concluding Thoughts



But...





Acknowledgements

- CRAP collaborators at the University of Oregon (Bridgham, Bohannan, Jin, Ye) and SERC (Megonigal)
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