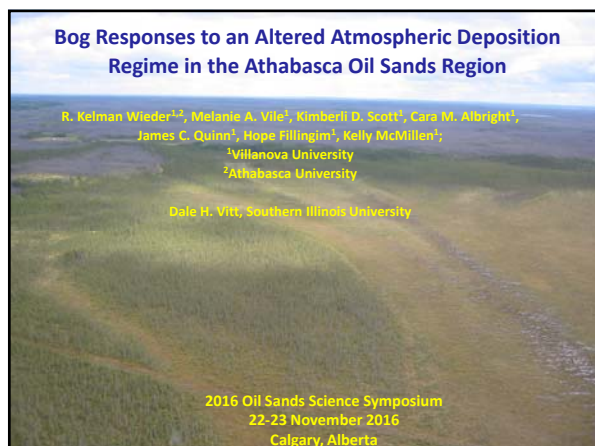
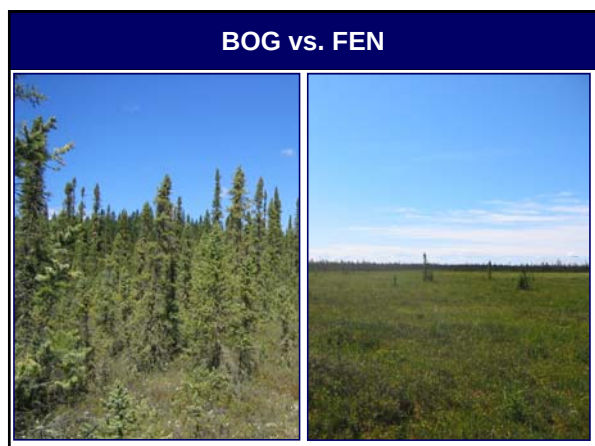




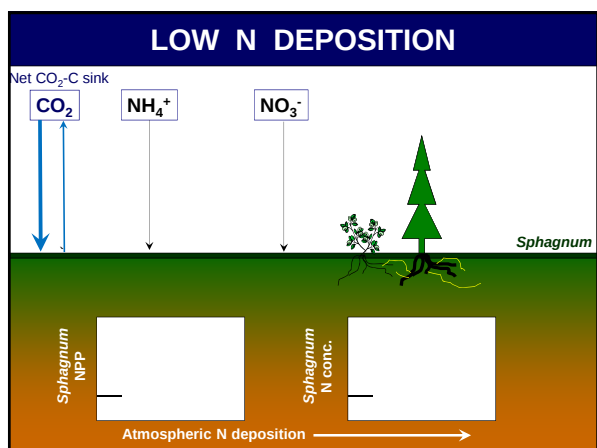


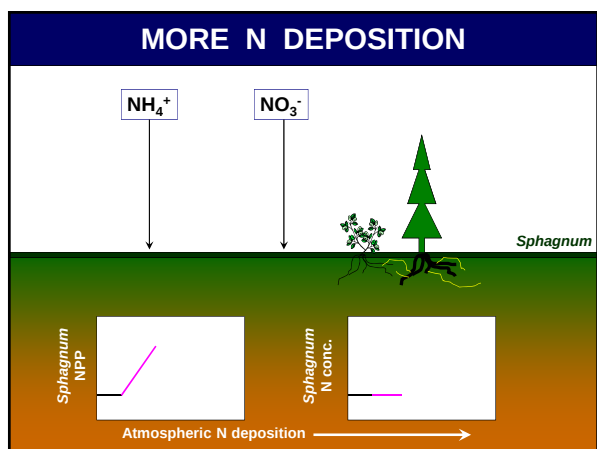


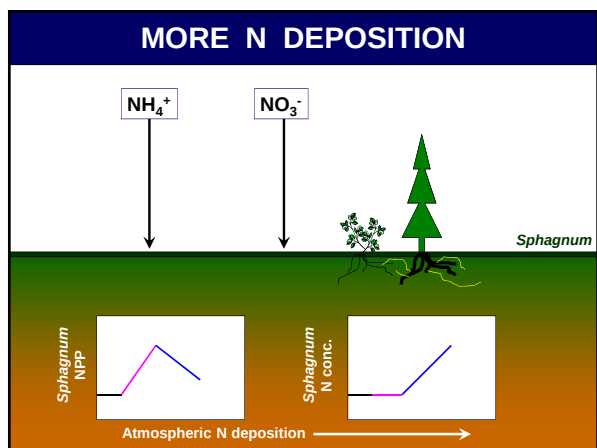


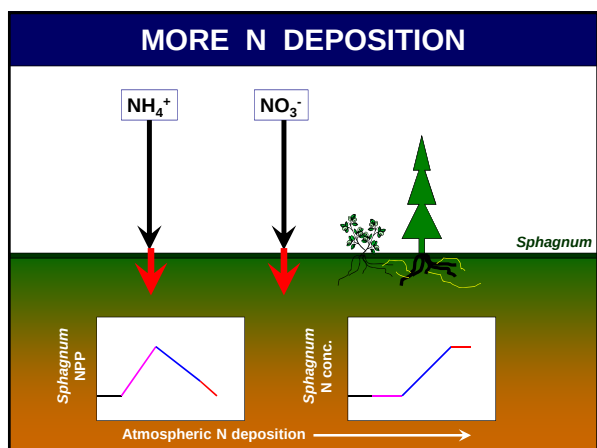


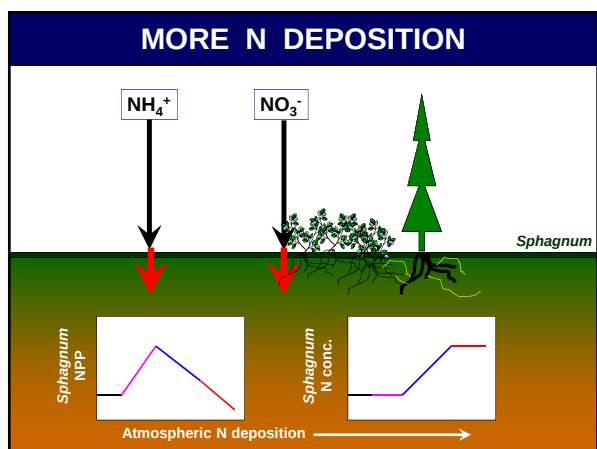


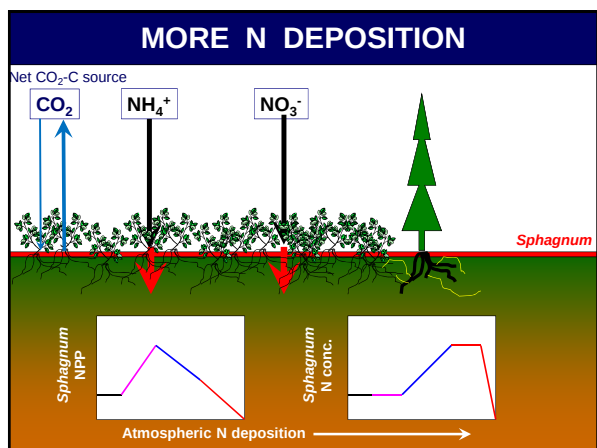


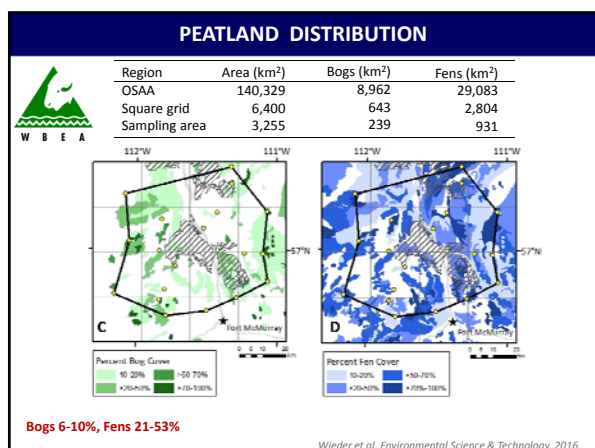


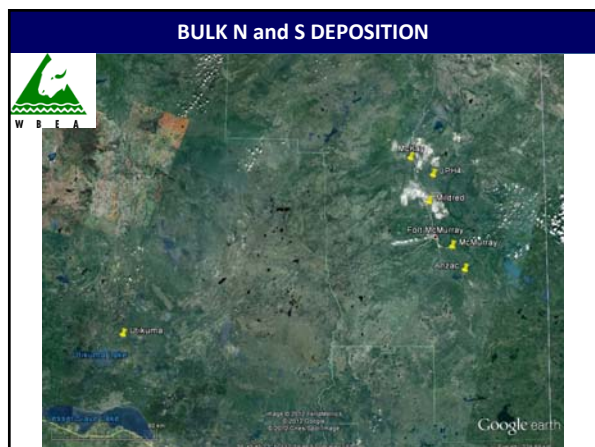










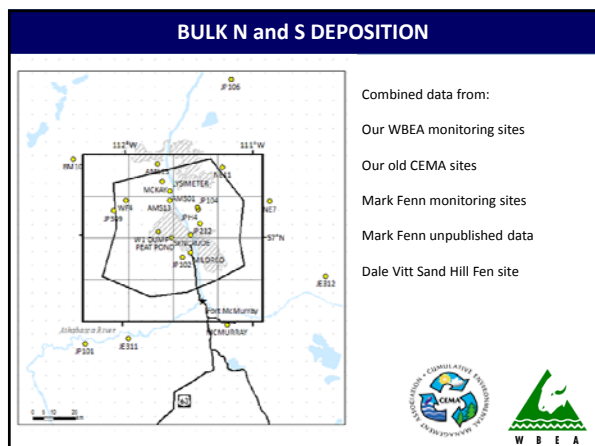


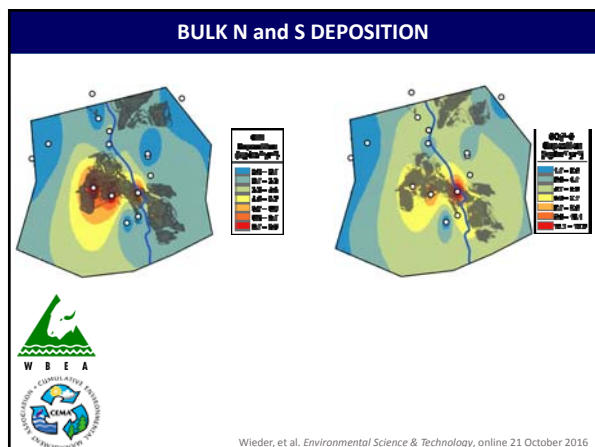
BULK N and S DEPOSITION

Resin Tubes – Mark Fenn design
 12 Resin Tubes/site; 6 sites
 5 in the open, 5 under black spruce, 2 controls
 7 collections (October 2009 – October 2012)
[7 collections \(through October 2016\)](#)
 About 1,000 samples

Extraction and analysis for:
 NH₄⁺-N – colorimetric, Seal Analytical AA3 AutoAnalyzer
 NO₃⁻-N – colorimetric, Seal Analytical AA3 AutoAnalyzer
 ion chromatography
 SO₄²⁻-S – colorimetric, Lachat Flow Injection Analyzer
 ion chromatography
 Ca²⁺, Mg²⁺ – Atomic absorption spectrophotometry
 ortho-P – colorimetric, Seal Analytical AA3 AutoAnalyzer

Wieder et al. 2016, Biogeochemistry 129: 1-19





Sphagnum fuscum GROWTH

Is *Sphagnum fuscum* growth stimulated by elevated N deposition?

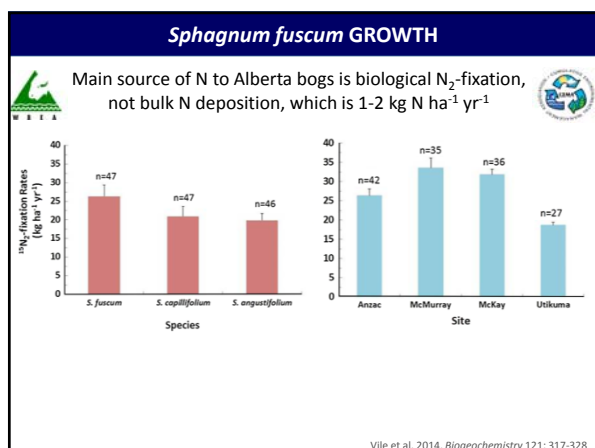
No: Wieder et al. 2010, *J. Limnol.* 69: 161-170.

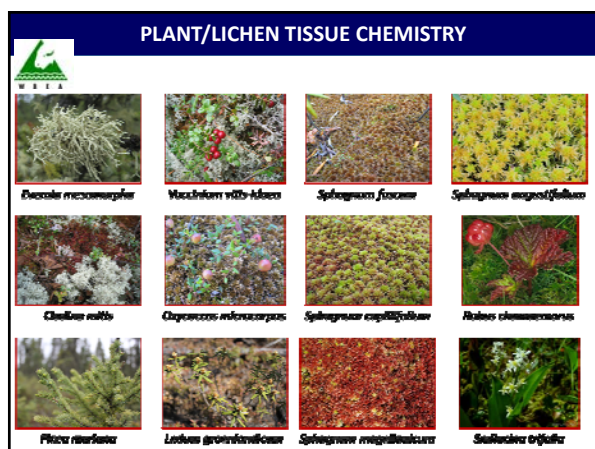
No: Vile et al. 2014, *Biogeochemistry* 121: 317-328

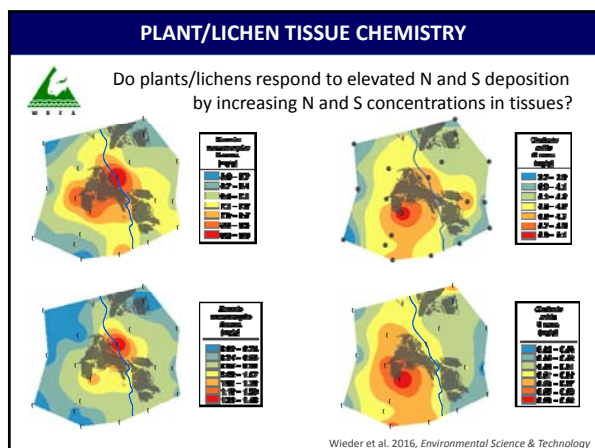
No: Wieder et al. 2016, *Biogeochemistry* 129: 1-19

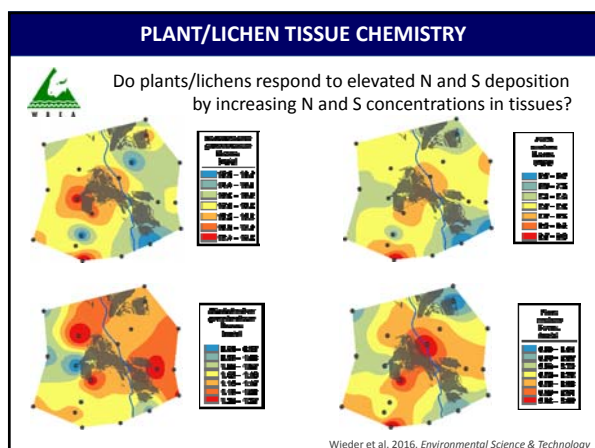
No: Our unpublished results

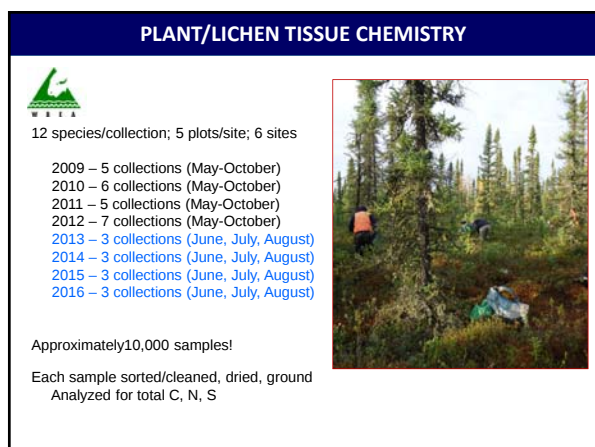
Why not?

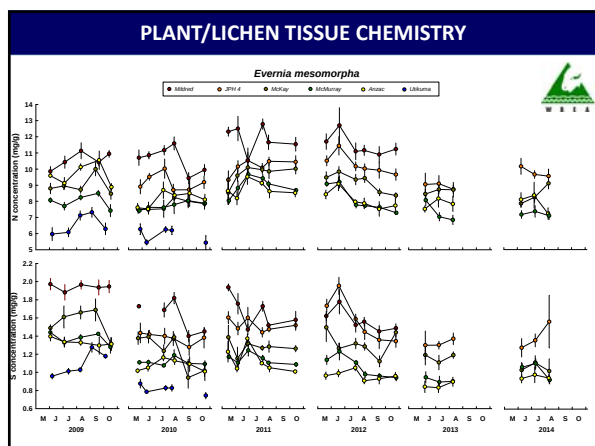


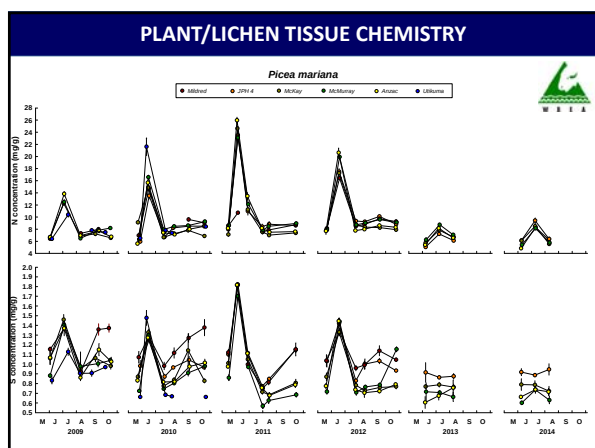


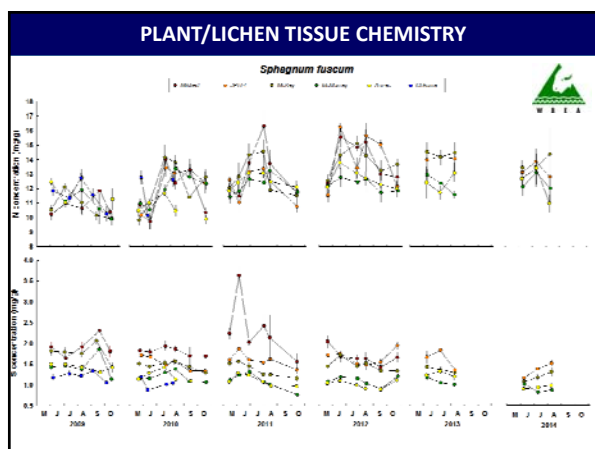


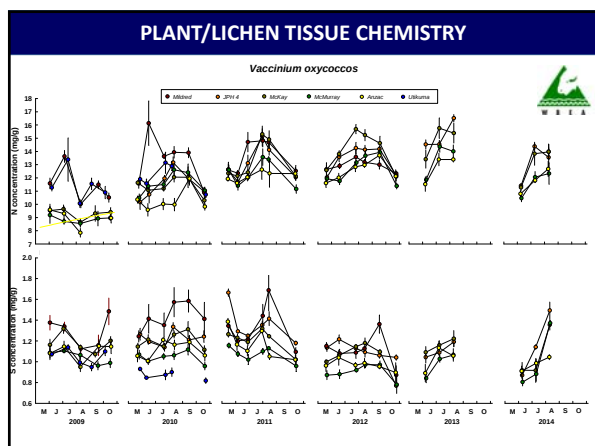


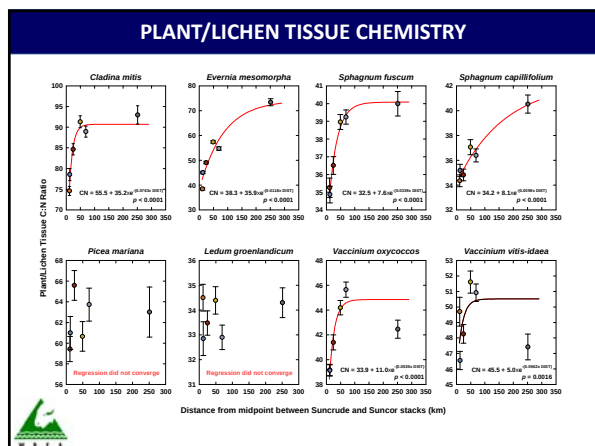


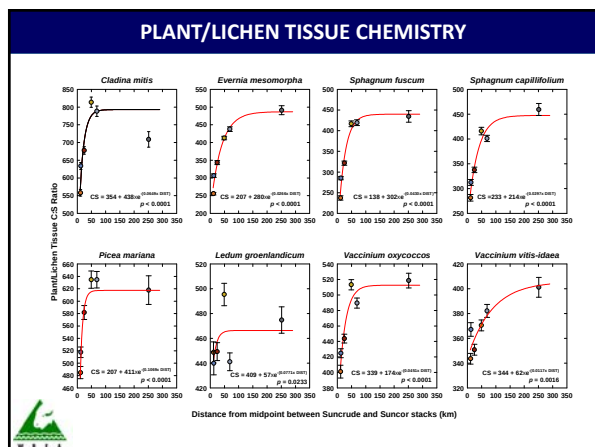












IS BOG POREWATER CHEMISTRY AFFECTED?

3 sipper/peepers per site
10 cm increments to 1 m below peat surface

2009 – 5 collections (May-October)
2010 – 6 collections (May-October)
2011 – 5 collections (May-October)
2012 – 7 collections (May-October)
2013 – 3 collections (June, July, August)
2014 – 3 collections (June, July, August)
2015 – 3 collections (June, July, August)
2016 – 3 collections (June, July, August)

Approximately 2400 samples

Each filtered and analyzed for:
 $\text{NH}_4^+\text{-N}$ – colorimetric, Seal Analytical AA3 AutoAnalyzer
 $\text{NO}_3^-\text{-N}$ – ion chromatography
 $\text{SO}_4^{2-}\text{-S}$ – ion chromatography
 Total dissolved N and dissolved organic C – Shimadzu TC/TN Analyzer
 Dissolved organic N as TDN - $\text{NH}_4^+\text{-N}$ - $\text{NO}_3^-\text{-N}$

IS BOG POREWATER CHEMISTRY AFFECTED?



Intensive bog monitoring: No



Experimental N addition: No



Experimental N addition: No

IS THERE A SHRUB GROWTH/COVER RESPONSE?



Yes, bog and poor fen



Yes, bogs



??



EXPERIMENTALLY ADDED N







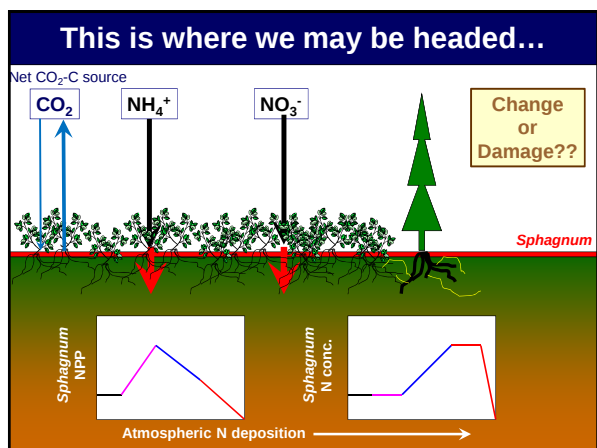












SUMMARY

Peatlands are important

European conceptual model not directly transferrable to Alberta peatlands in OSAA

Role of N_2 -fixation

Lack of *Sphagnum* growth response to increasing N deposition

Vascular plant and *Sphagnum* moss responses are species-specific

Increase in shrub growth/cover may be occurring in higher N deposition sites

WHAT NEXT?

INTENSIVE MONITORING OF PEATLANDS/WETLANDS

How many sites and where?

Co-deployment of passive monitors

Response variables should be periodically assessed

Shrub/tree growth and cover

Changes in species composition

Net CO_2 exchange; decomposition

CH_4 – other gases?

SYNOPTIC SURVEYS

How many sites and where and how often?

Which variables should be measured?

QUESTIONS??



Photo by RKW
