# Nitrogen Cycling in Headwater Wetlands across Condition Gradients in Pennsylvania and Ohio

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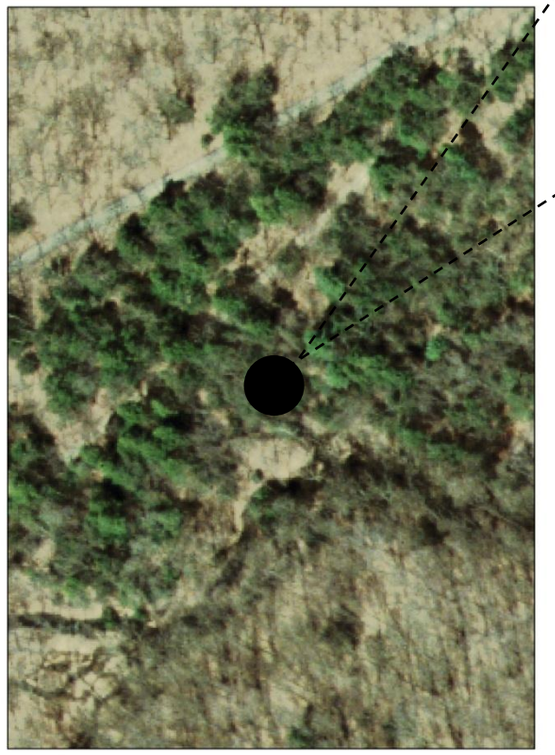
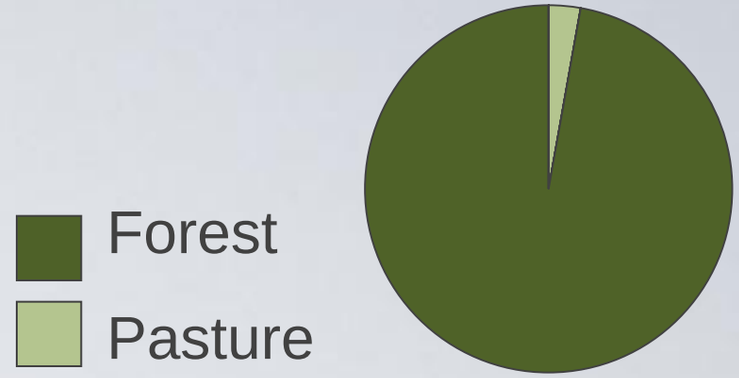
# Wetland Condition: Landscape Context

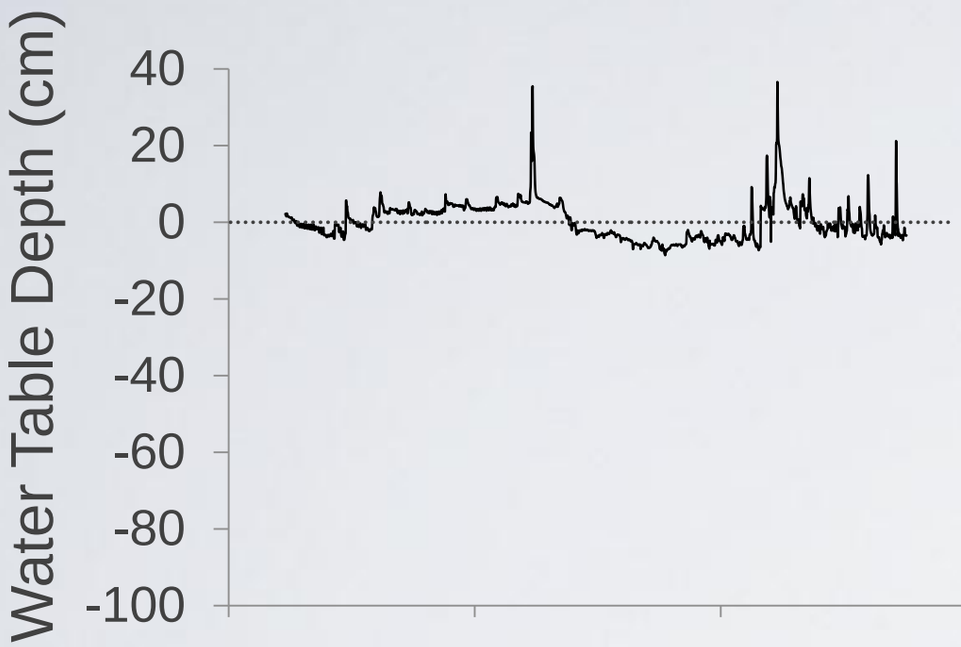



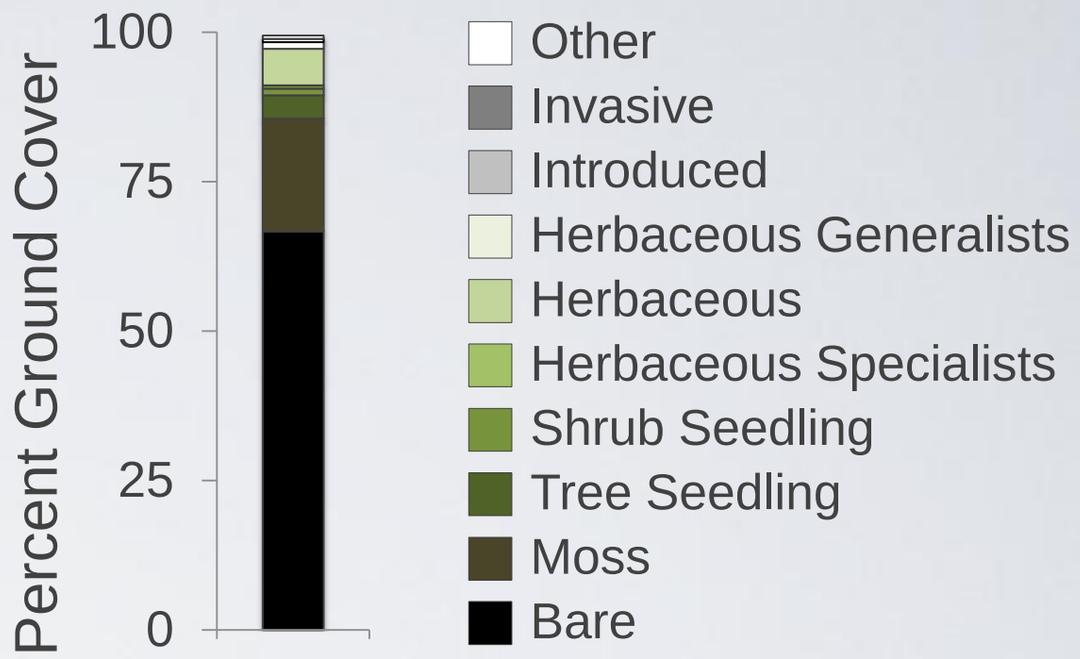
# High Condition

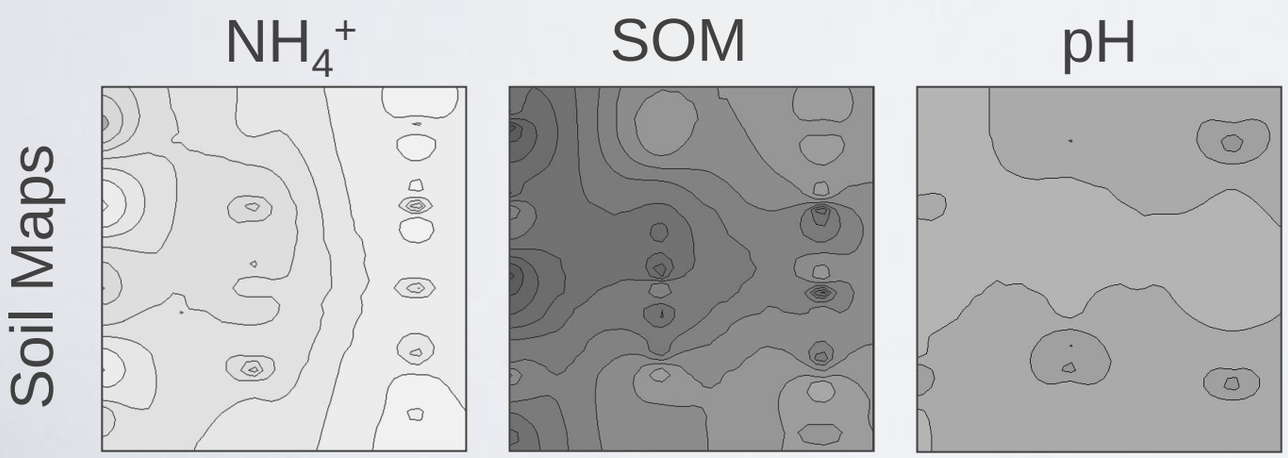
## Landscape

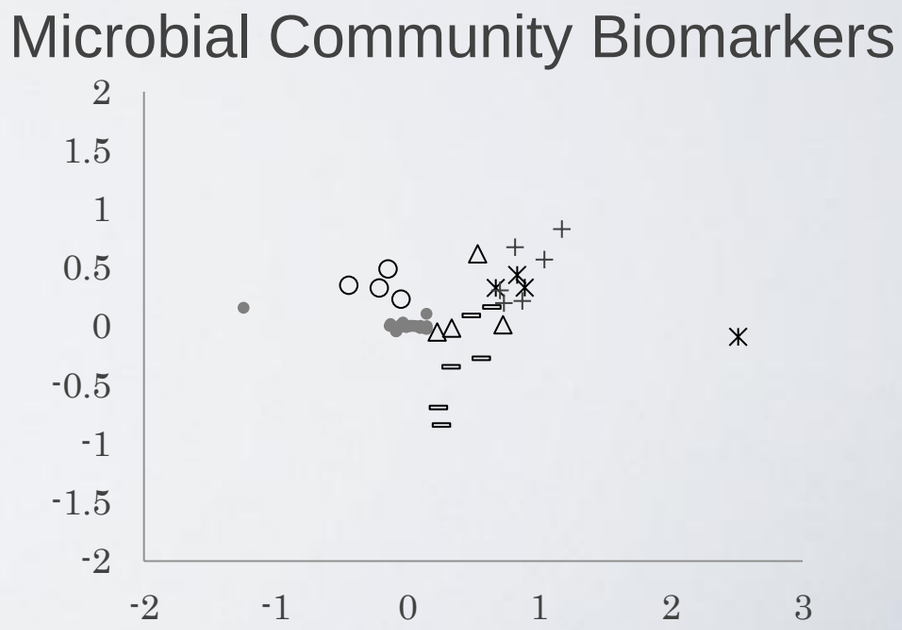



## Wetland



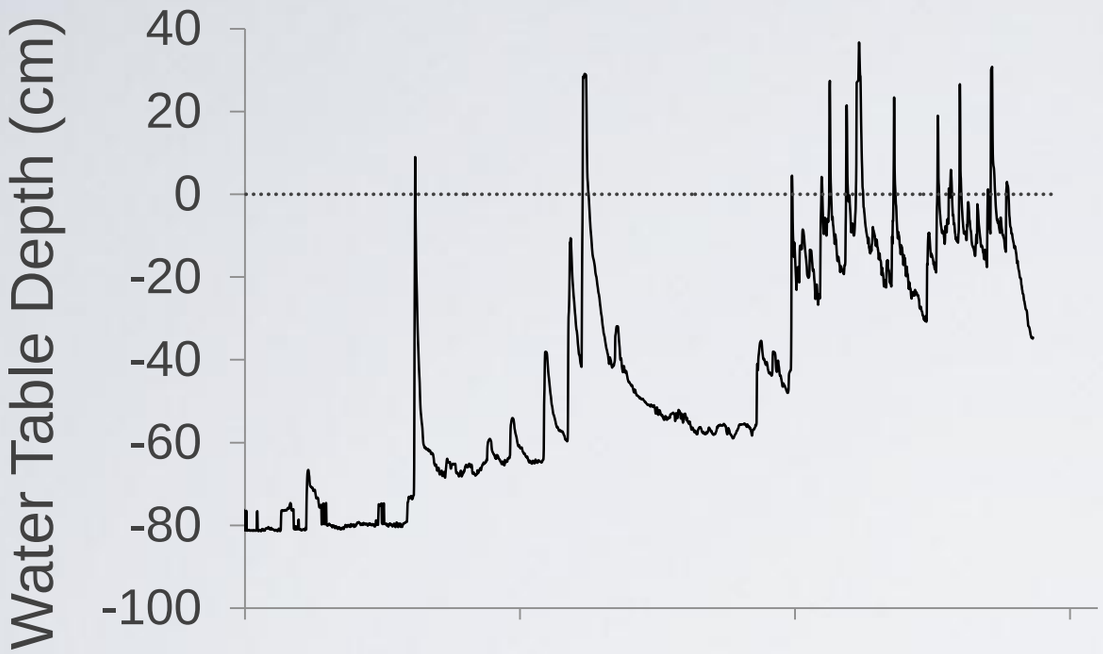



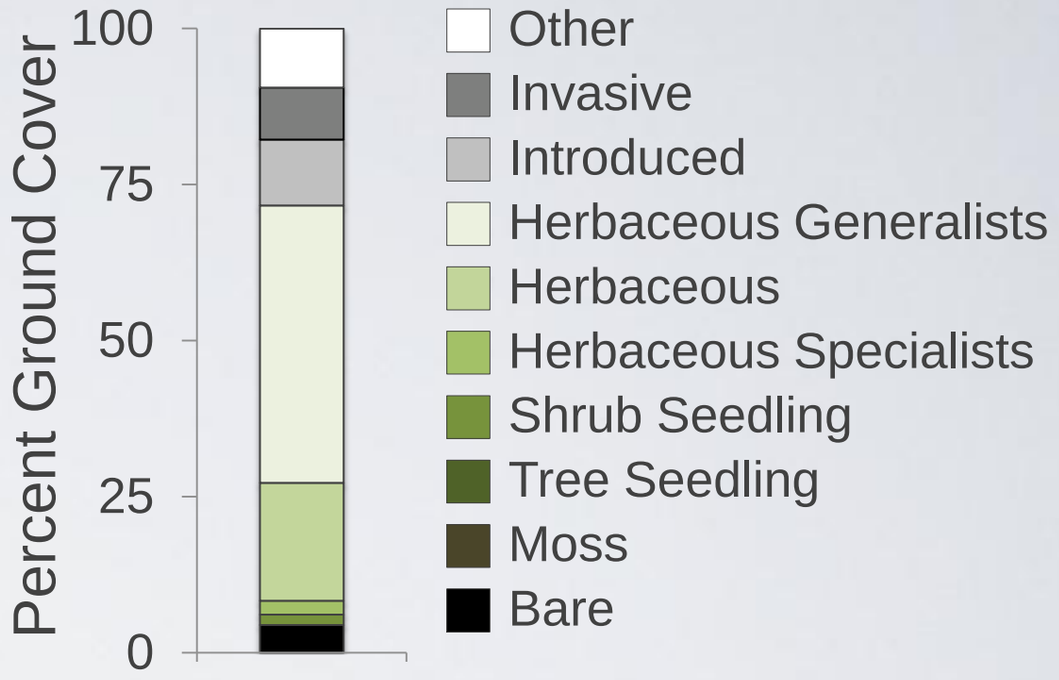



# Low Condition

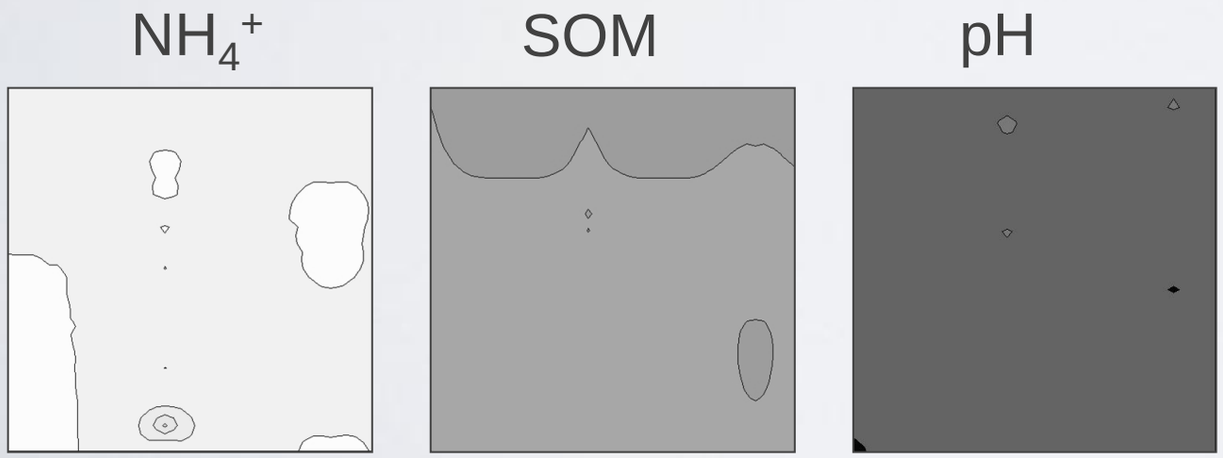
## Landscape


## Wetland

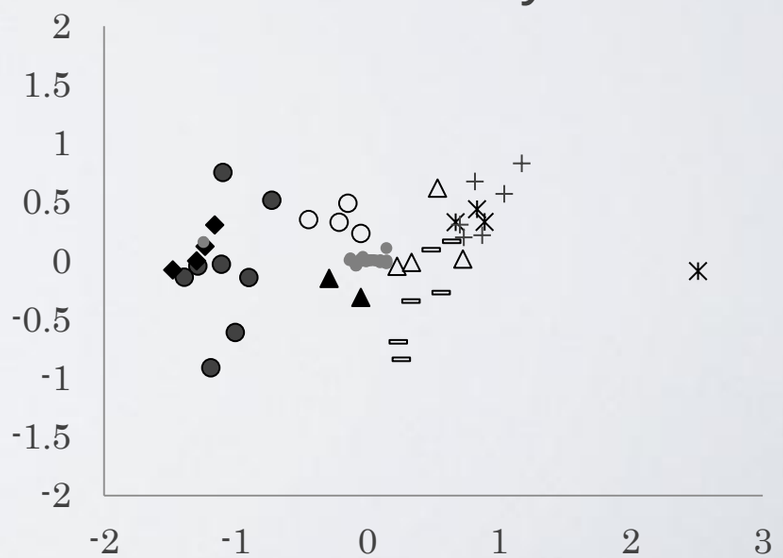



Soil Maps

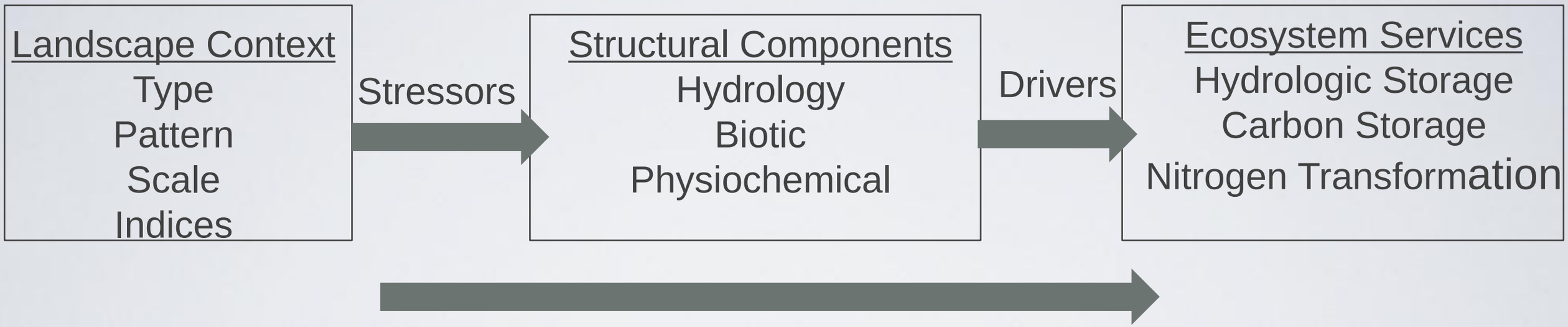



Microbial Community Biomarkers



# Study Objective

Build models that describe the relationships between landscape context and ecosystem services through links among intermediate structural wetland components.

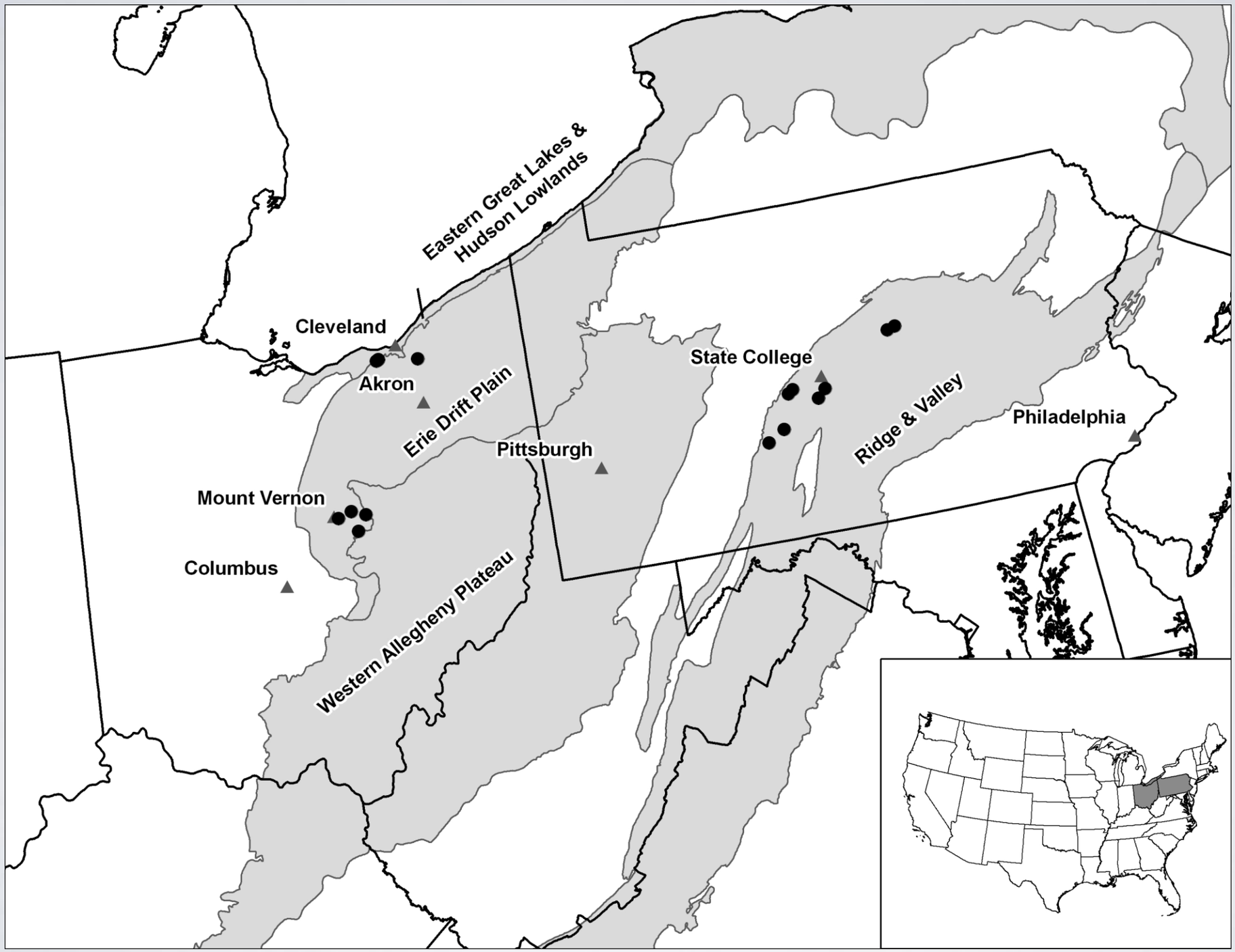



# Talk Focus

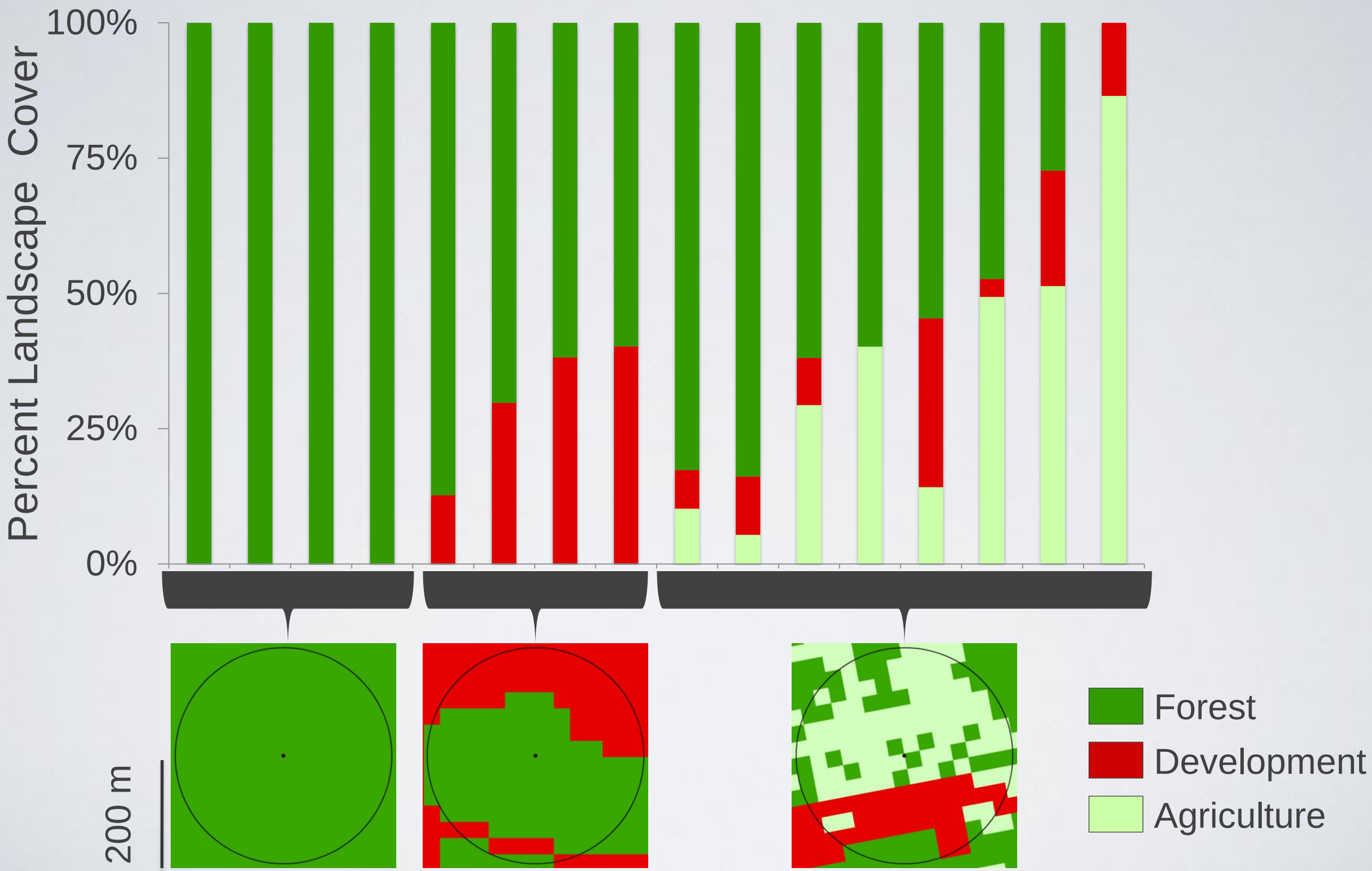
Determine if any signals exists between general landscape context and nitrogen cycling pathways (i.e., denitrification, nitrogen mineralization).

# Headwater Wetland Study Sites

Sites Cities Ecoregions State Boundaries



# Landscape Context for Study Sites



# Nitrogen Cycling: Sampling Scheme

40 m

40 m

Denitrification Potential: Push-Pull (n = 2-3)

Denitrification Potential: Acetylene Block (n = 5)

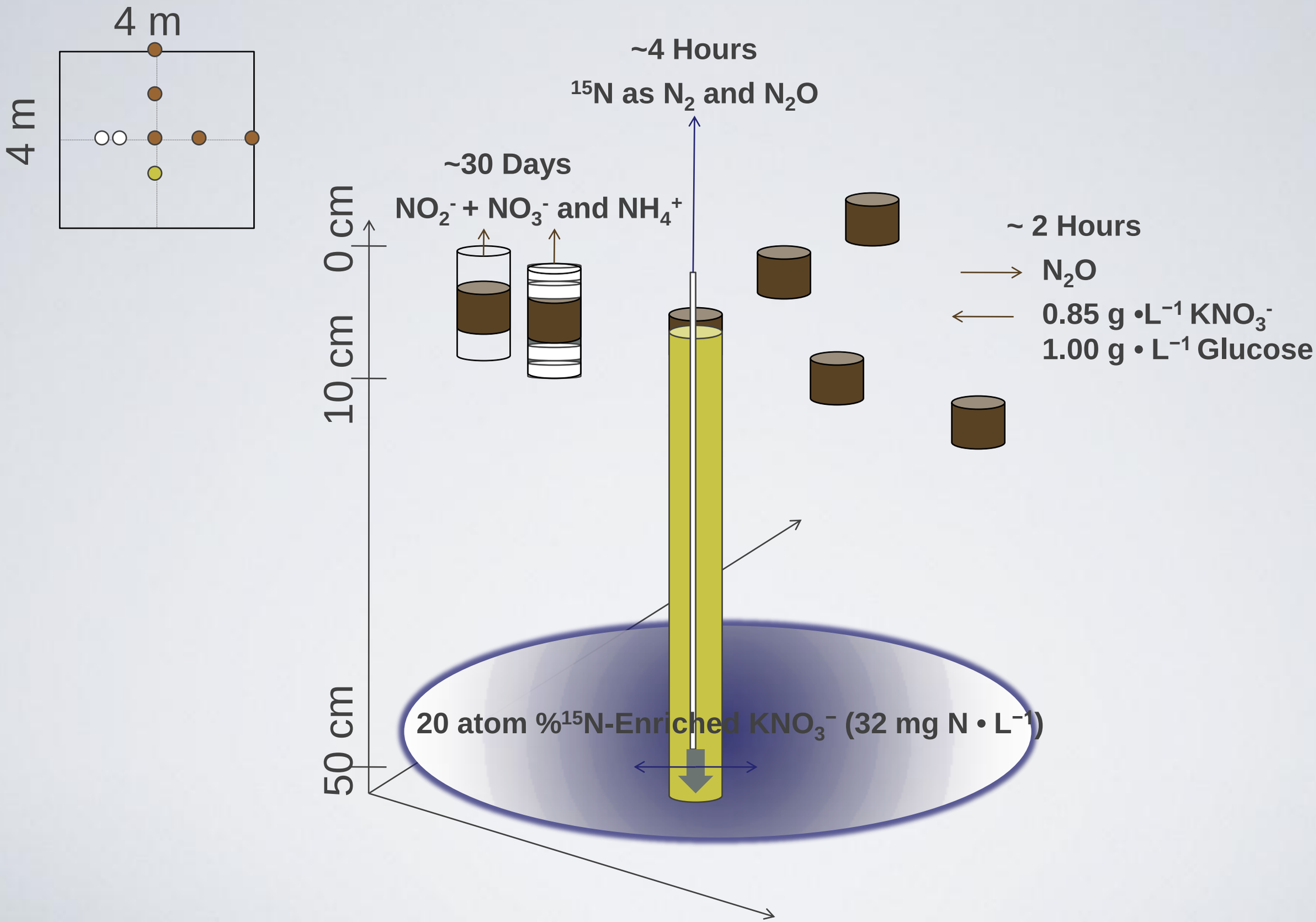
Nitrogen Mineralization (n = 4)

Monitoring Well (n = 3)

4 m

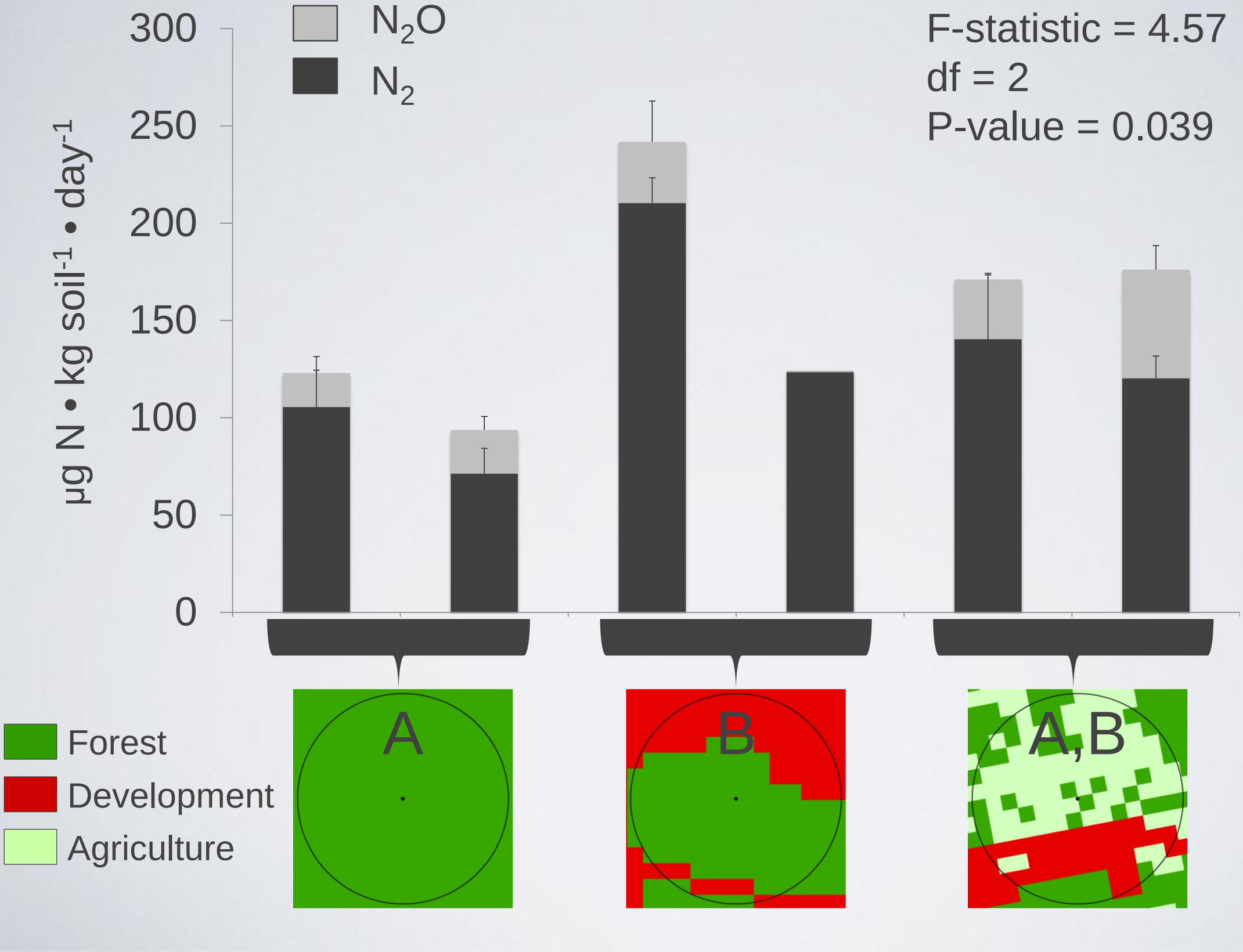
4 m

# Nitrogen Cycling: Sampling Scheme

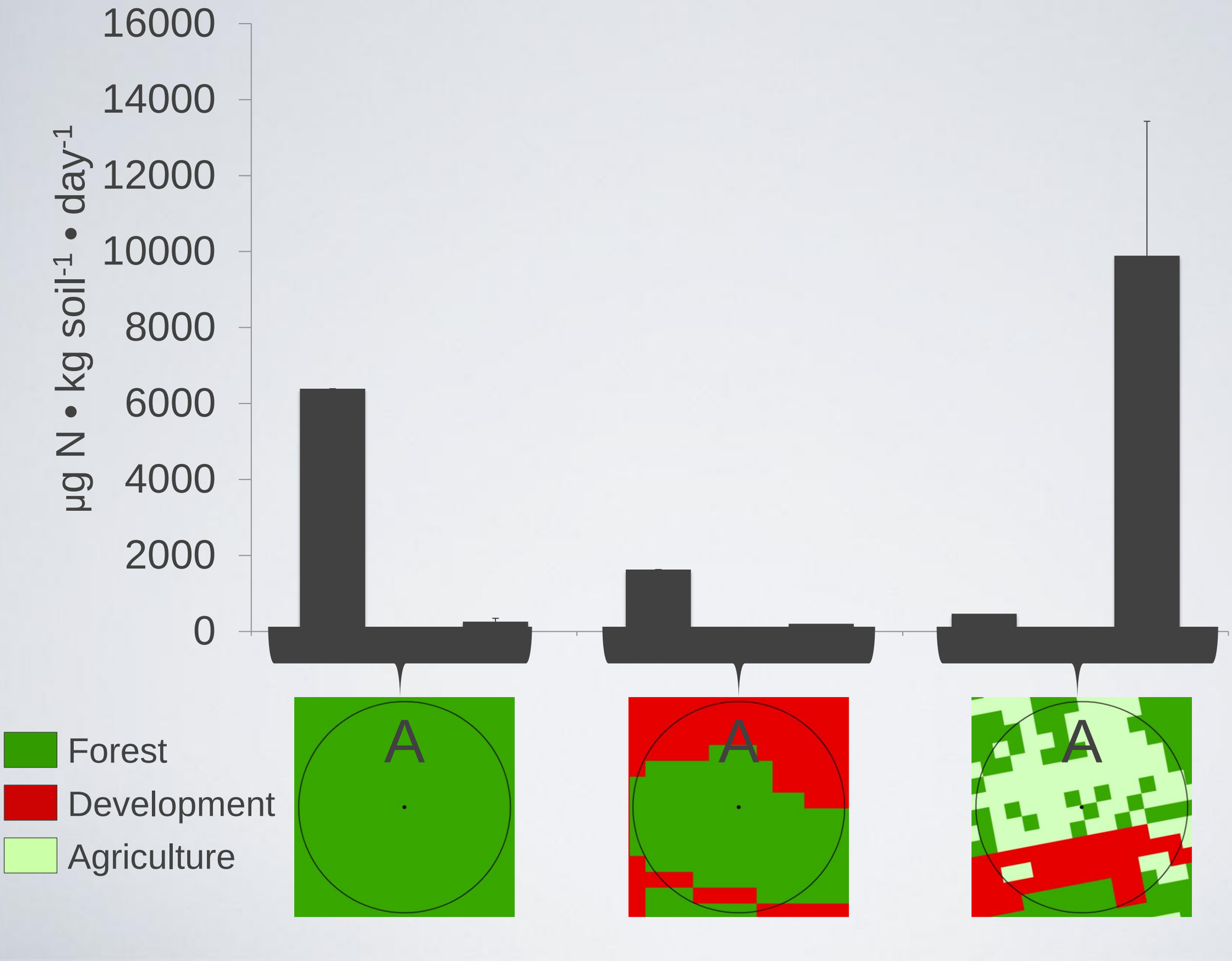



Noe 2011, Soil Sci. Soc. Am. J.; Harrison et al. 2011, Journal of Environmental Quality

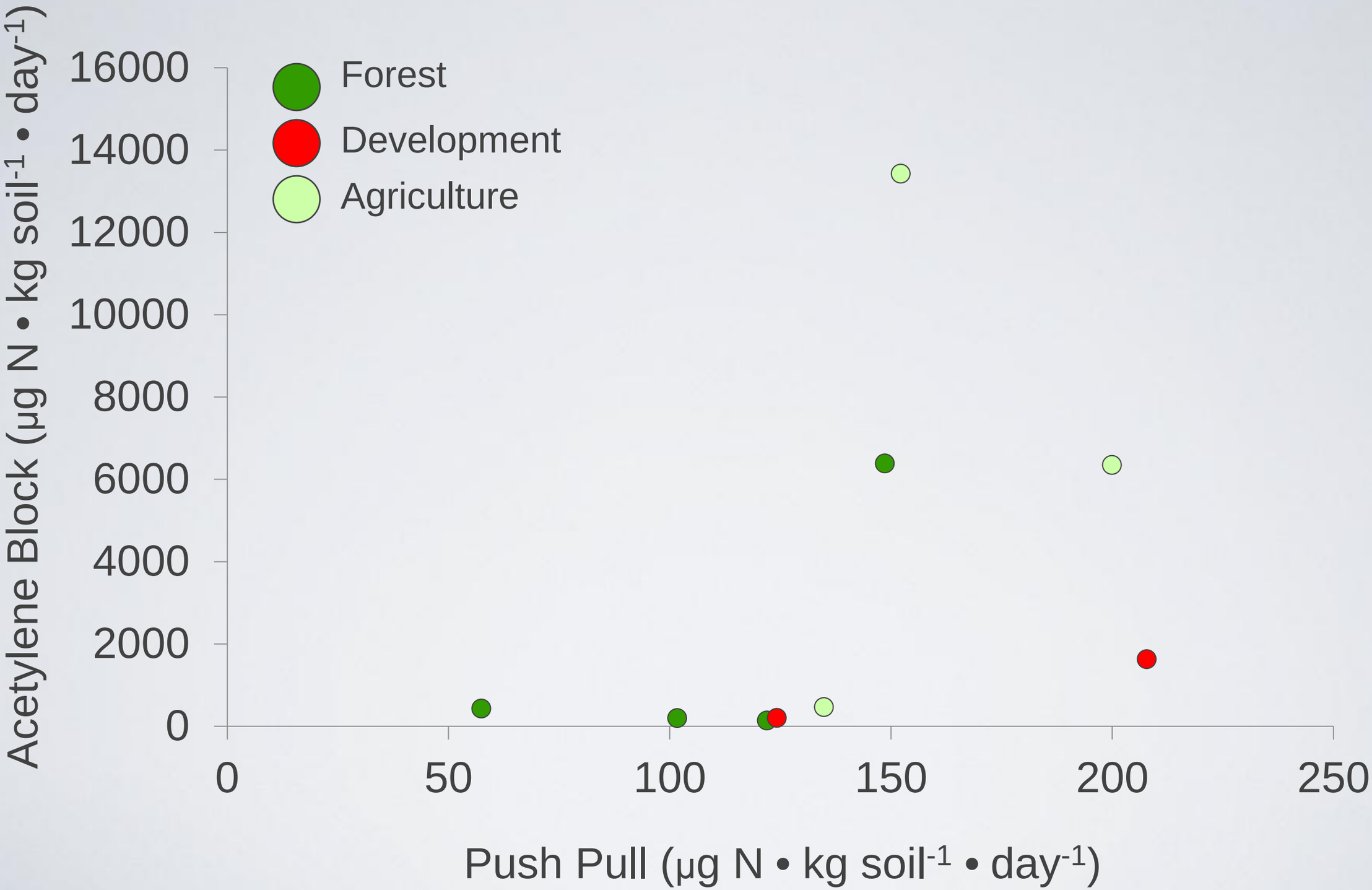
# Denitrification Potential: Push-Pull



# Denitrification Potential: Acetylene Block



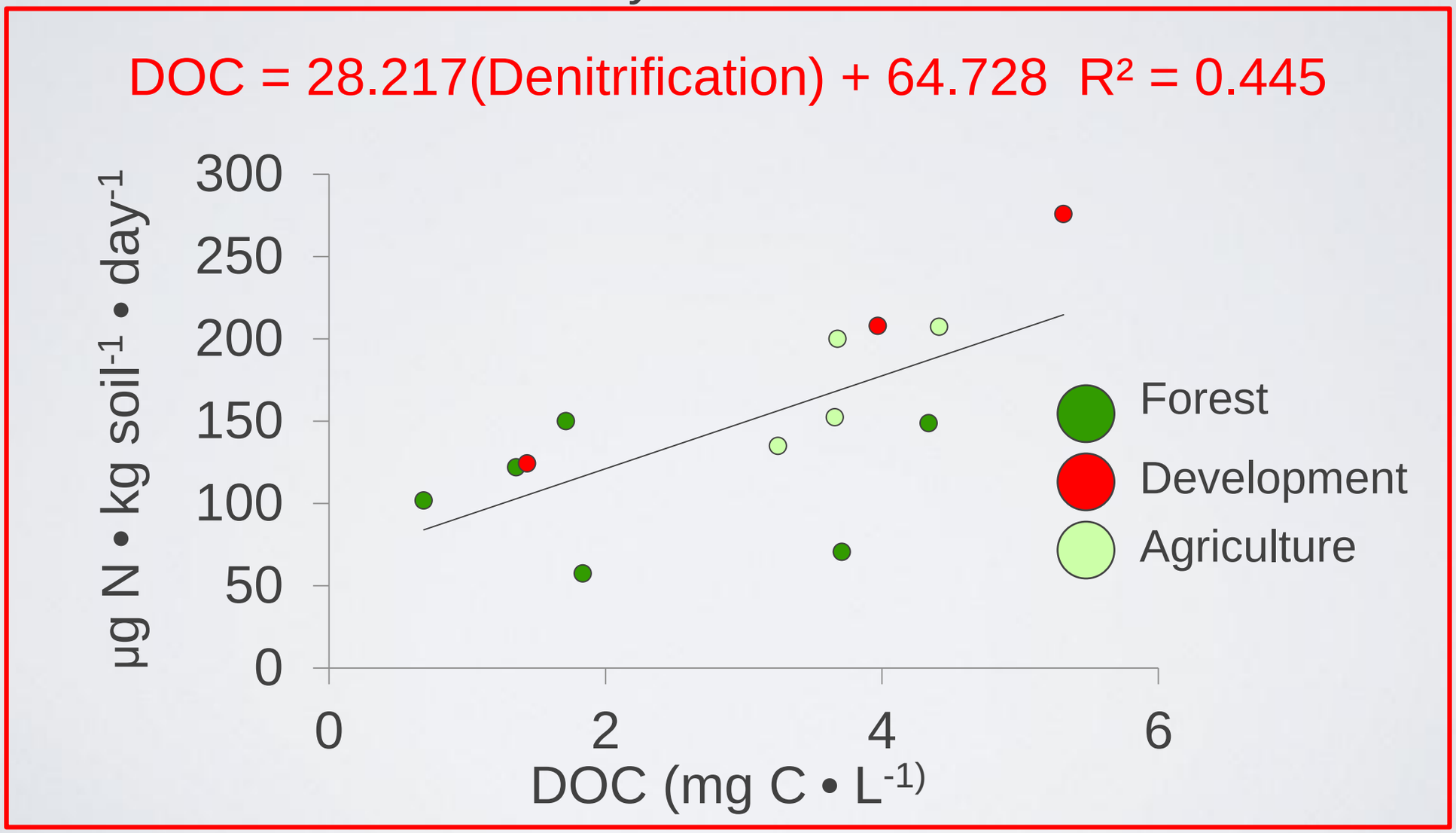
# Denitrification Potential
# Push-Pull vs. Acetylene Block



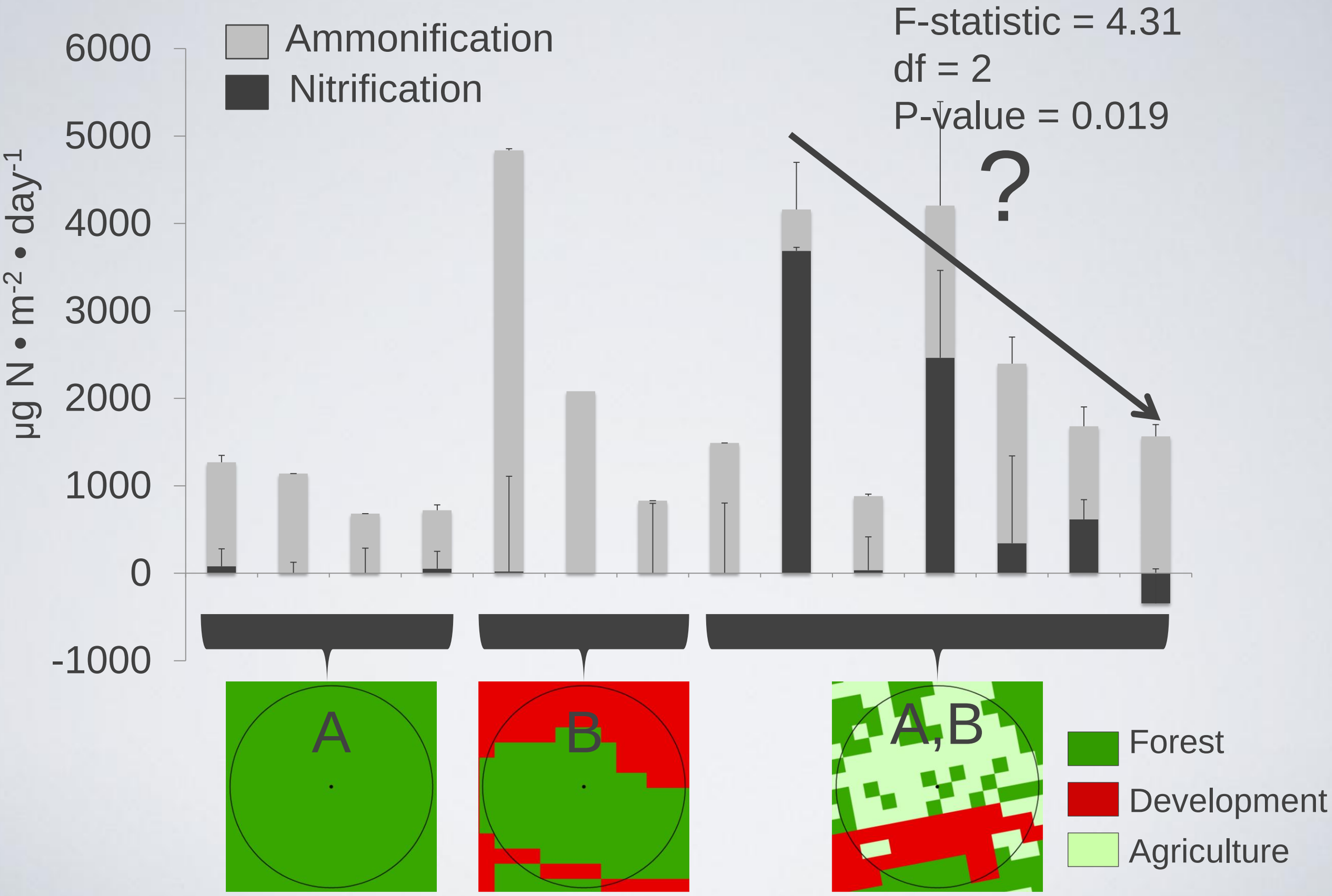
# Denitrification Potential vs. Ambient Conditions

Push-Pull Ambient Conditions

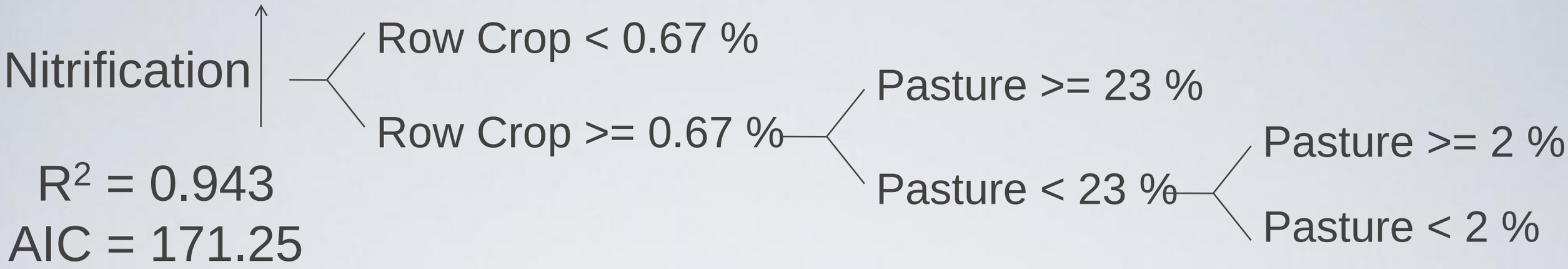
| | |
|---|---|
| DO | $NO_3^-$ |
| pH | $NH_4^+$ |
| **Temperature** | DOC |
| Conductivity | |



# Nitrogen Cycling: Mineralization

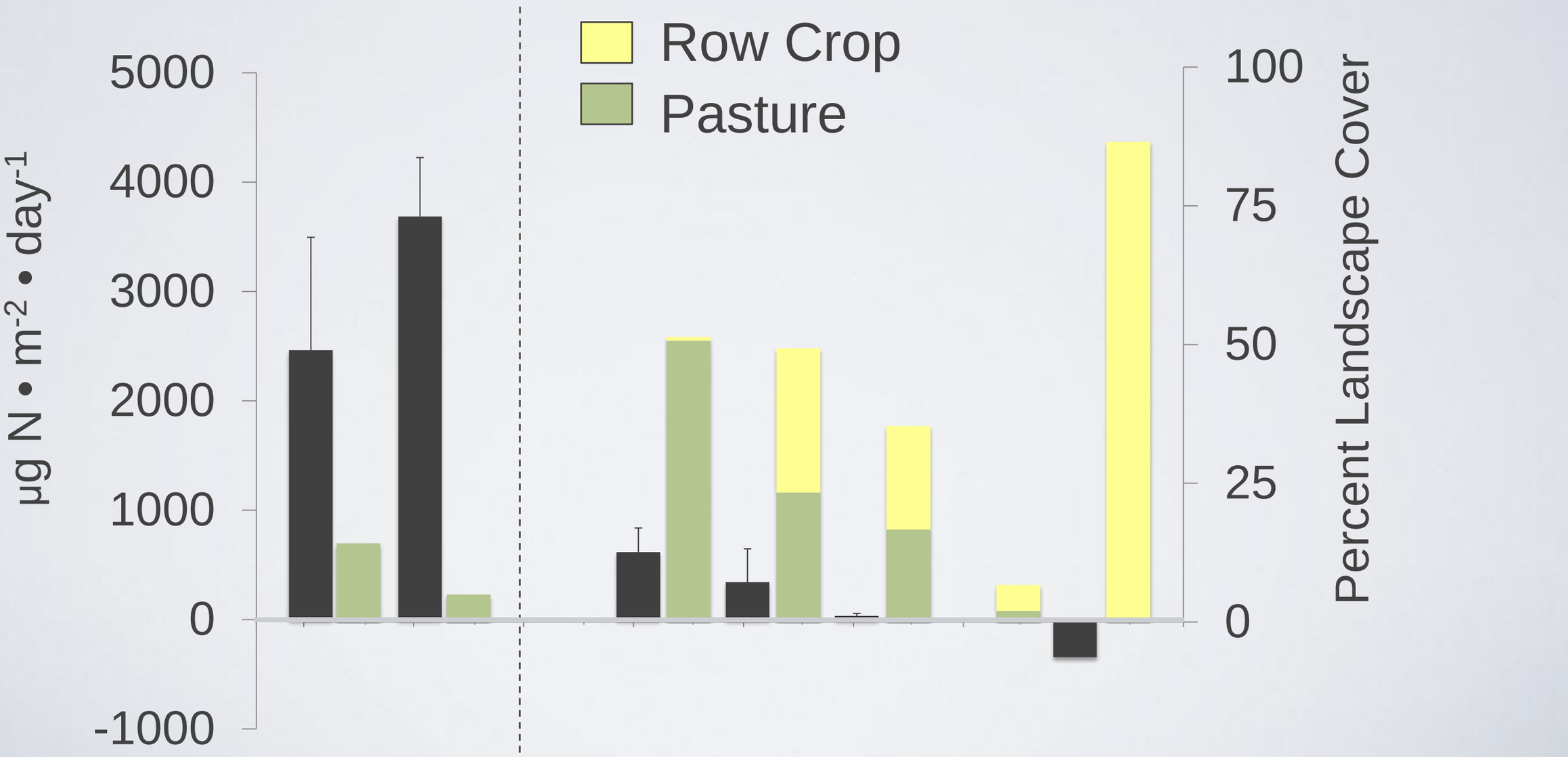


# Mixed Landscape: Nitrification




$R^2 = 0.943$

AIC = 171.25



# Next Steps for Nitrogen Cycling Component

Finish data collection, processing, and analysis

Construct/test models that describe the relationships among denitrification and structural components of wetlands

Compare denitrificaton methods, including soil $N^{15}$ values, which were also collected in the recent National Wetland Condition Assessment

# Acknowledgements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