

# Nitrogen Removal in Agricultural Watersheds: Ecological Interactions Associated with Forested and Agricultural Headwater Streams

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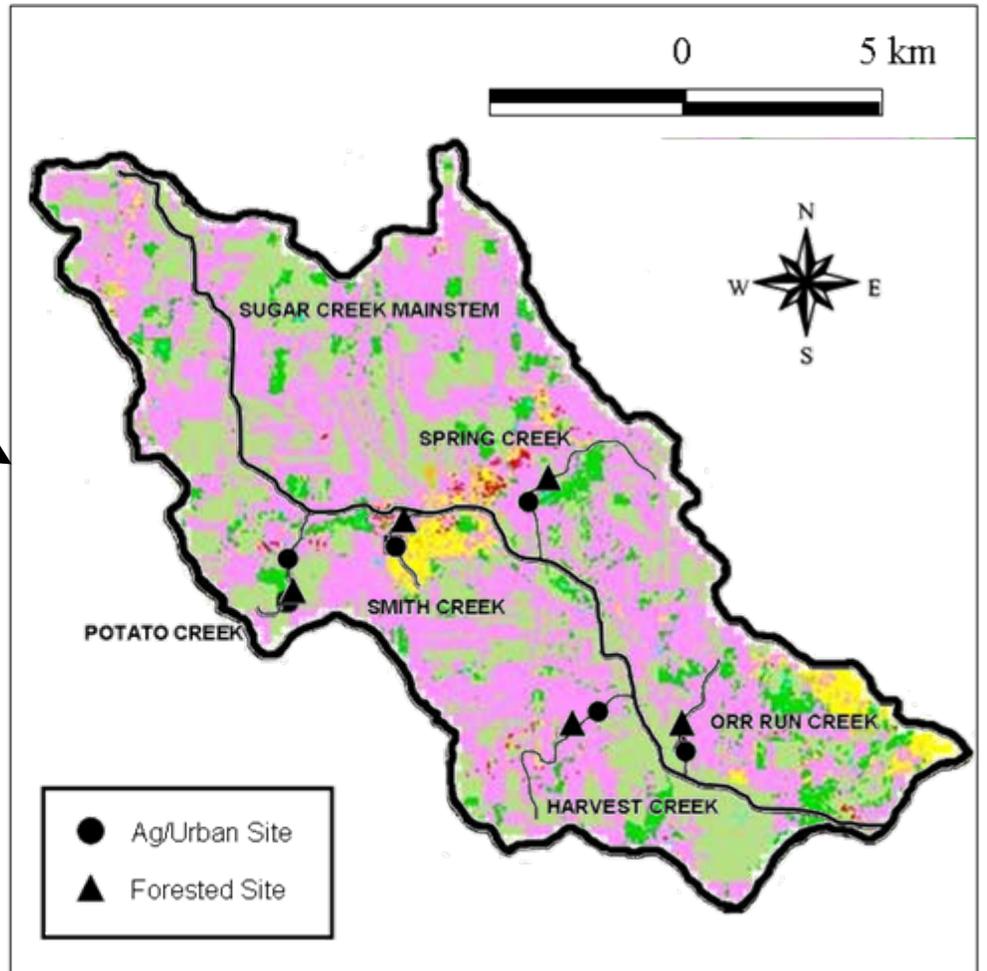


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# Objectives

1. Are headwater streams effective at removing N via denitrification
2. Do forested headwater streams remove more N than ag/urban streams
3. What controls N removal in these systems



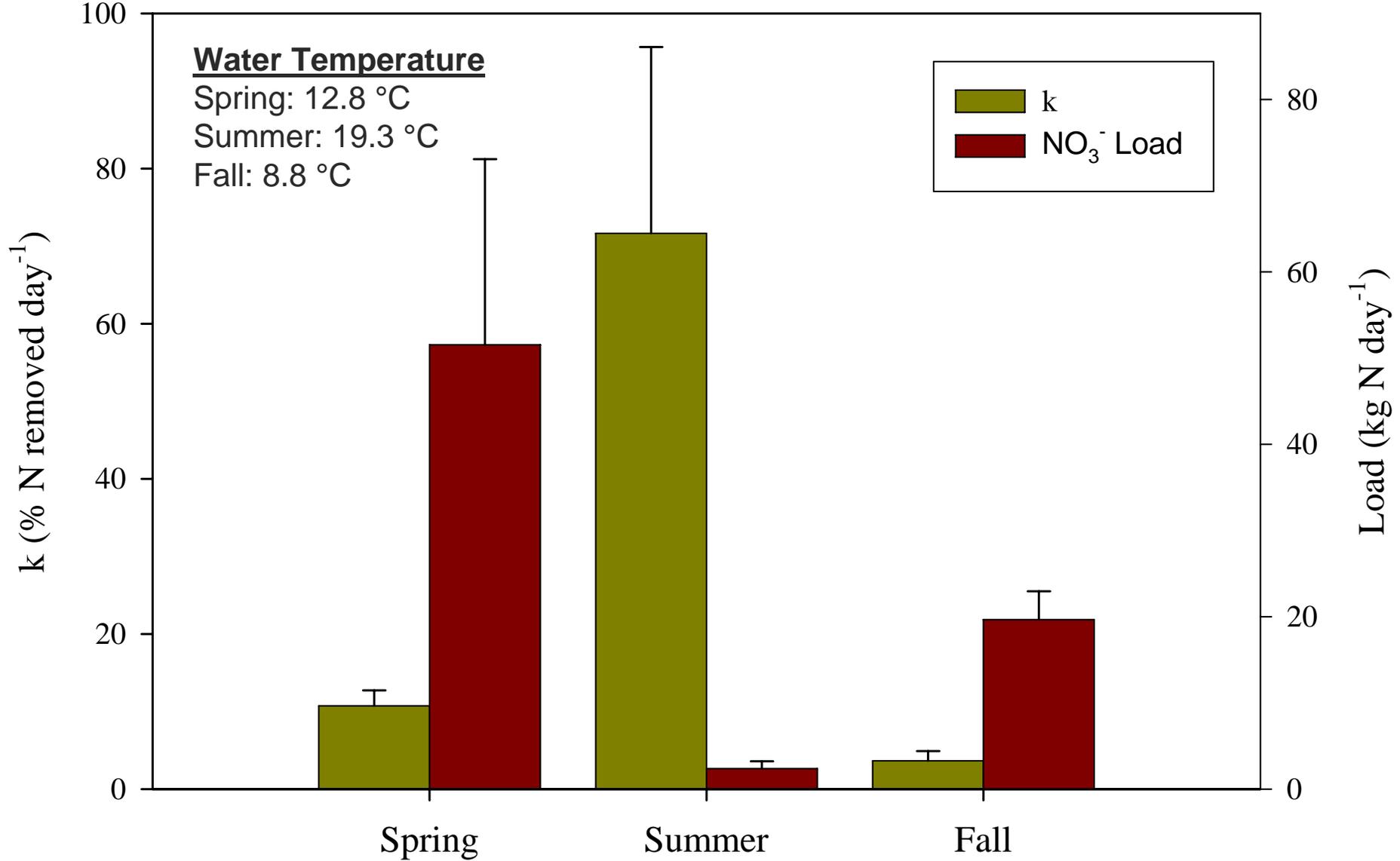


# Methods



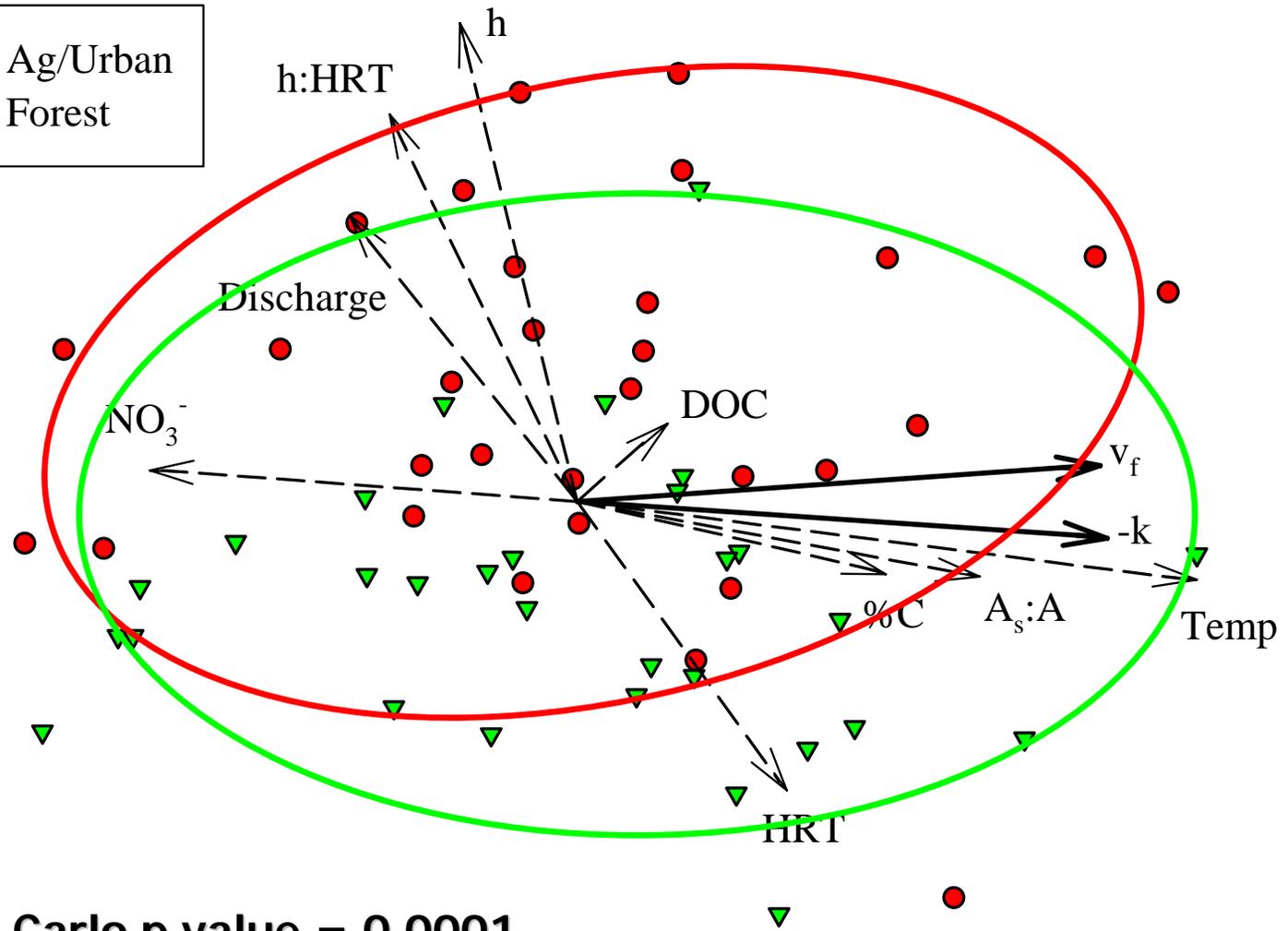
- Sediments collected randomly and homogenized for each reach
- Denitrification measured with  $C_2H_2$  inhibition on slurries
- N and P measured with Lachat Quikchem 8500
- DOC measured on Rosemont-Dohrmann Carbon Analyzer
- Rhodamine WT slug injections were run for each reach to measure residence time and yield breakthrough curves
- OTIS-P was used to calculate dispersion and storage area on breakthrough curves

# 1. Are headwaters effective at removing N



## 2. Forested vs. ag/urban streams

Principal Axis 2

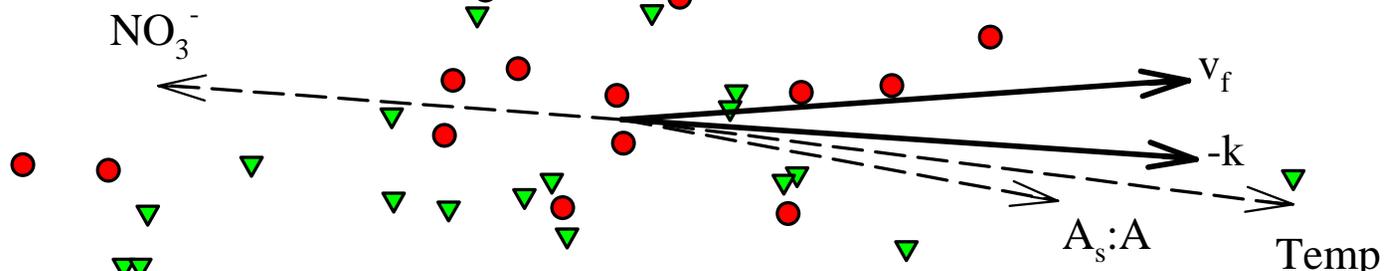


Monte Carlo p value = 0.0001  
Variance Explained = 57.1%

Principal Axis 1

# 3. What controls N removal

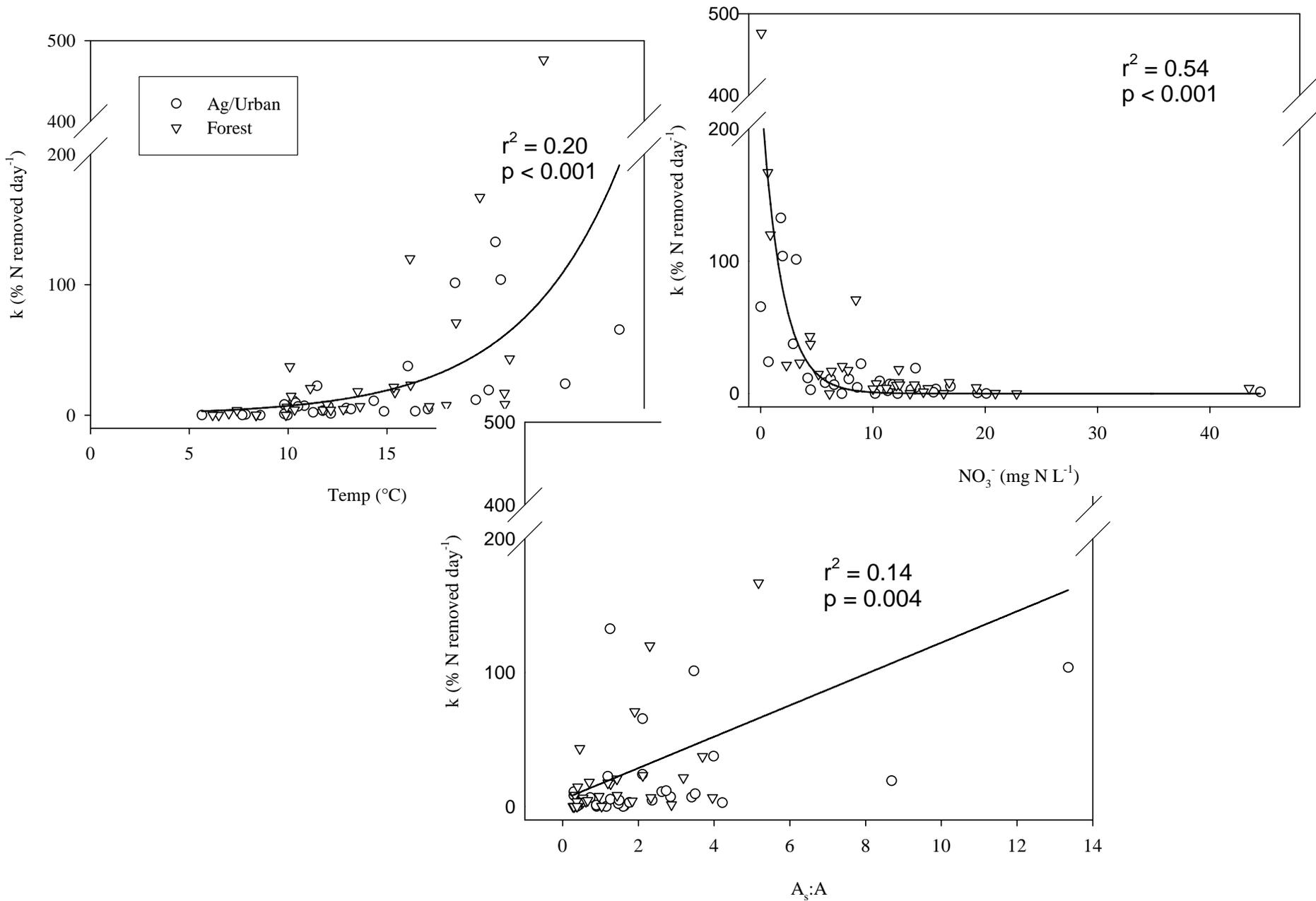
Principal Axis 2



Monte Carlo p value = 0.0001  
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Principal Axis 1

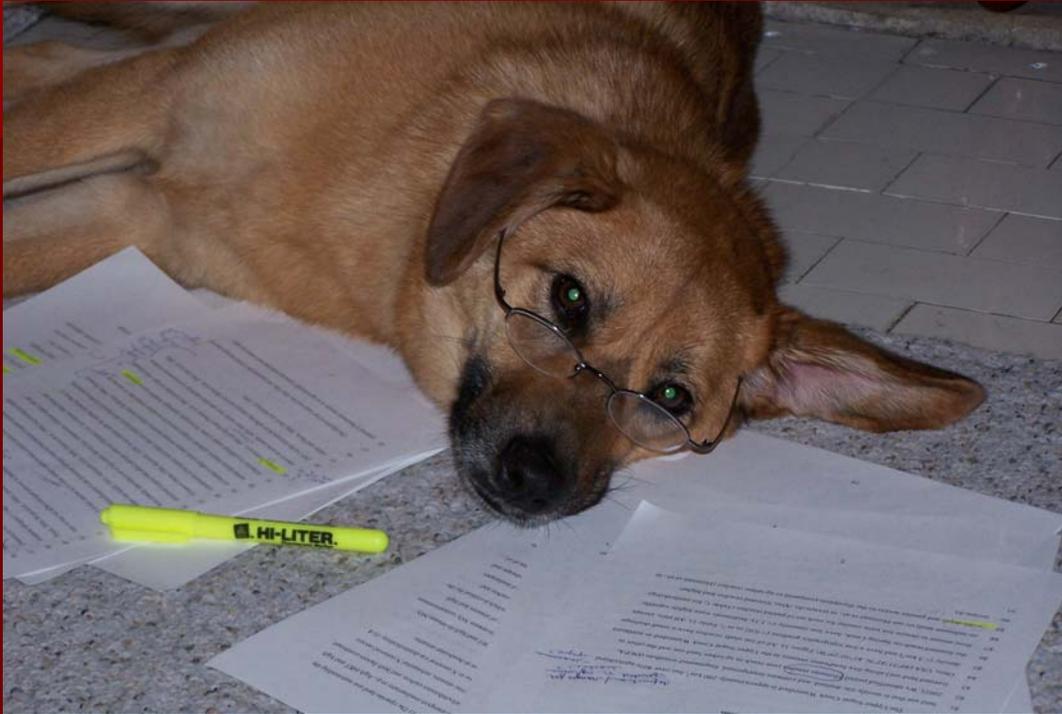
# 3. What controls N removal



# Conclusions

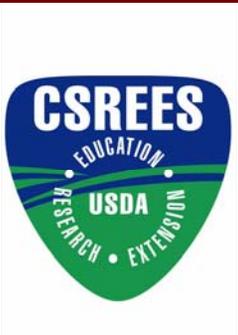
- N removal in headwater streams was low in agricultural watersheds and was only significant during periods in summer
- $\text{NO}_3^-$  saturation overwhelmed the N removal capacity of headwater streams regardless of land use

# Acknowledgments



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