Progress Report on AGCHEM Sensitivity Analysis

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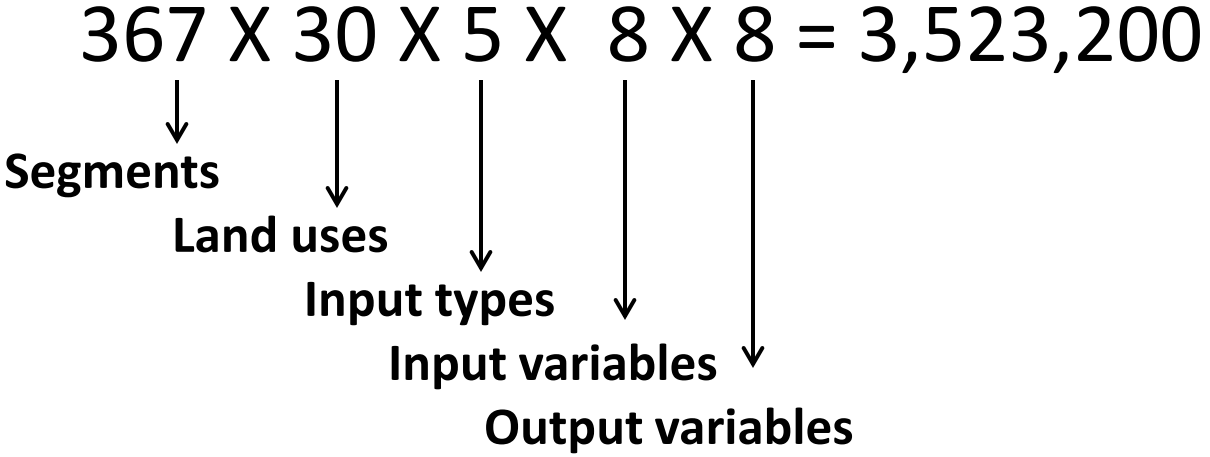
Modeling Quarterly Review Meeting
January 8-9, 2013
Annapolis

What is AGCHEM Sensitivity Analysis

Relationship between nutrient inputs and nutrient exports over all land segments, land uses and variables



Why we do AGCHEM Sensitivity Analysis

To Know
what we have done with AGCHEM

and
what we should do with PQUAL

Sensitivity =
Change in output / Change in Input = Slope

How we do AGCHEM Sensitivity Analysis

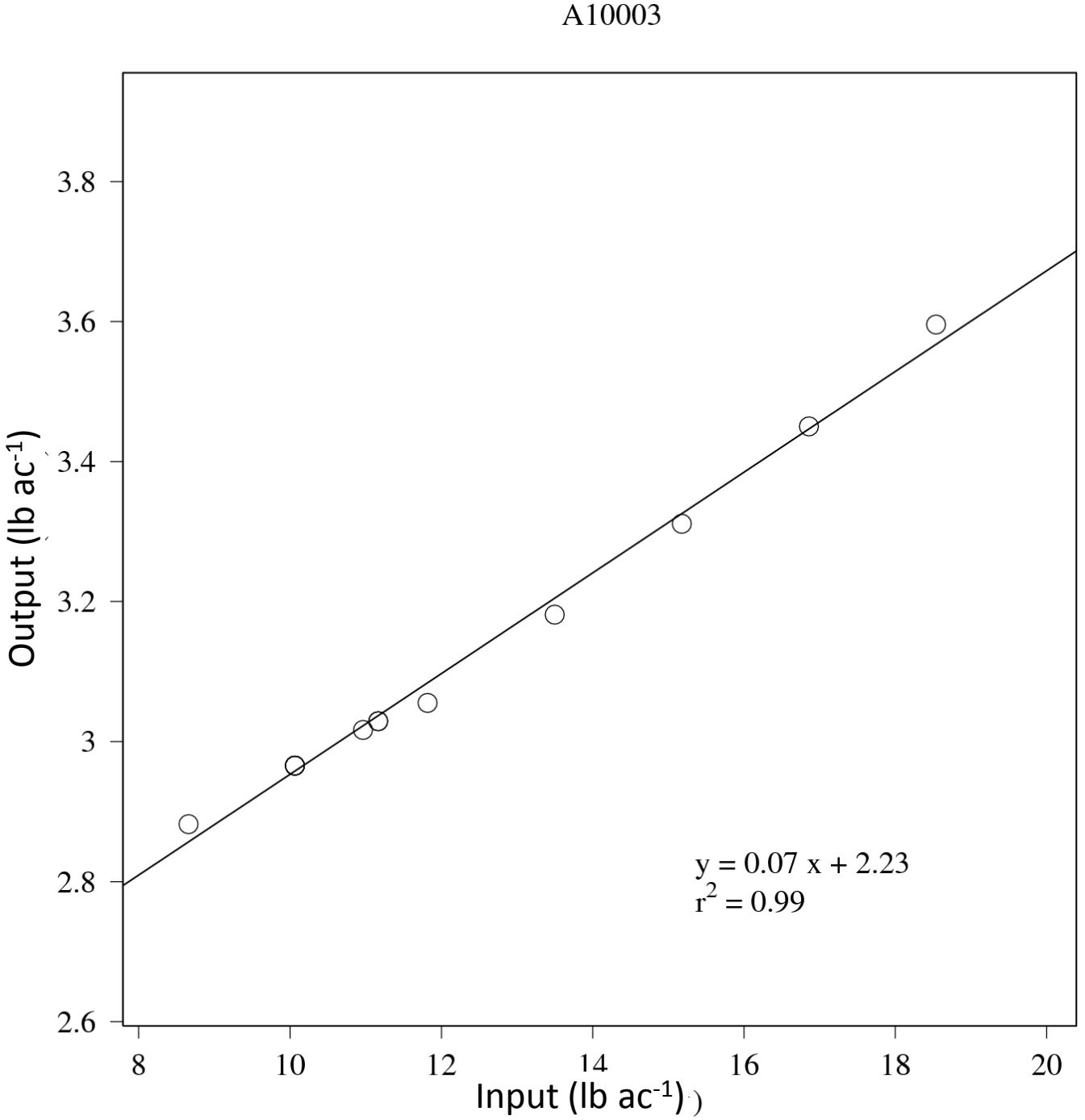
Progressive
progress
approach

Atmospheric deposition to forest: Total nitrogen output and input

Good correlation:

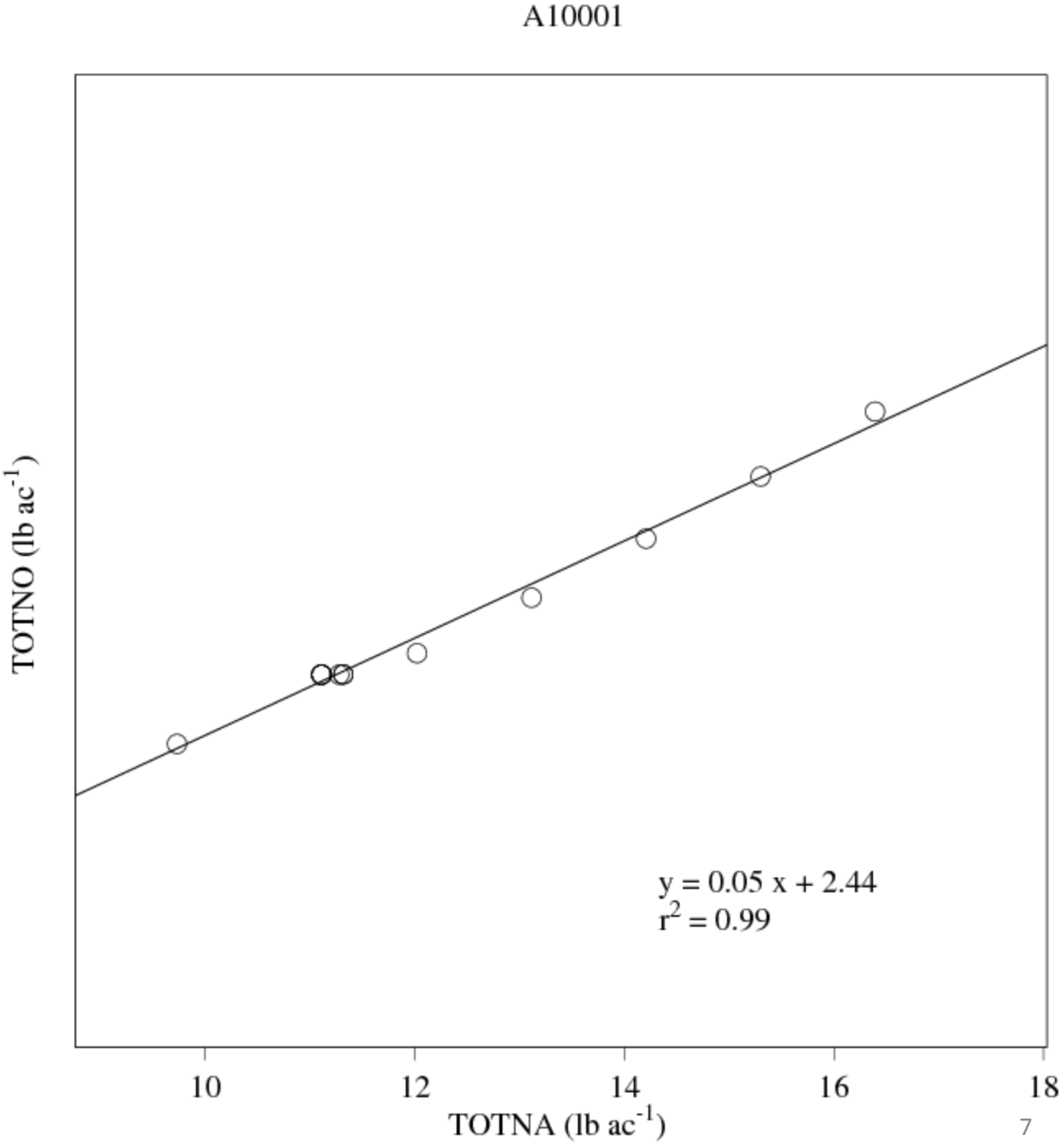
Total nitrogen output versus input

Strong linear relationship between output and input



Movie:

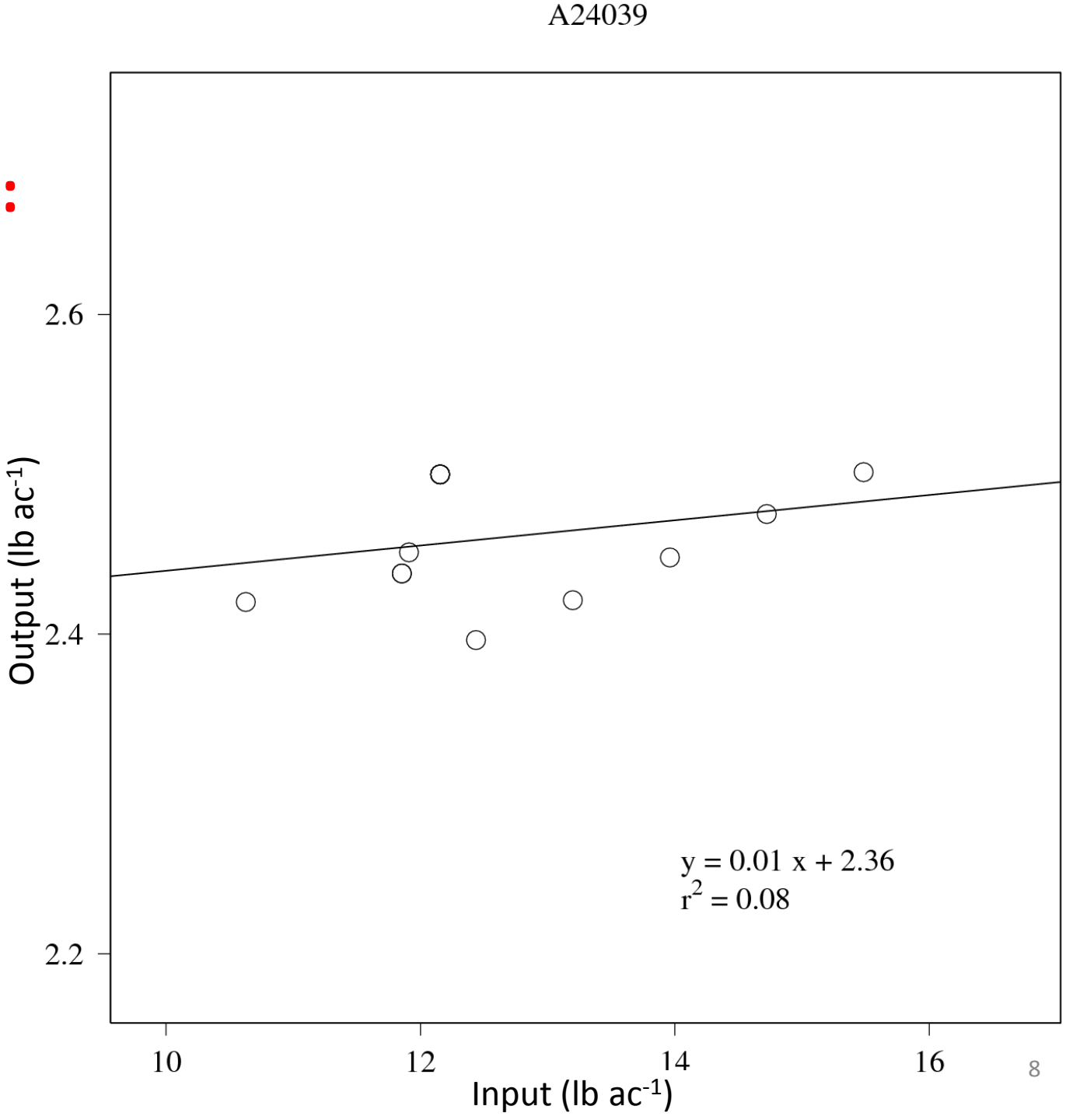
Total nitrogen output versus input



Most land segments have a strong linear relationship between input and output.

Weak Correlation:

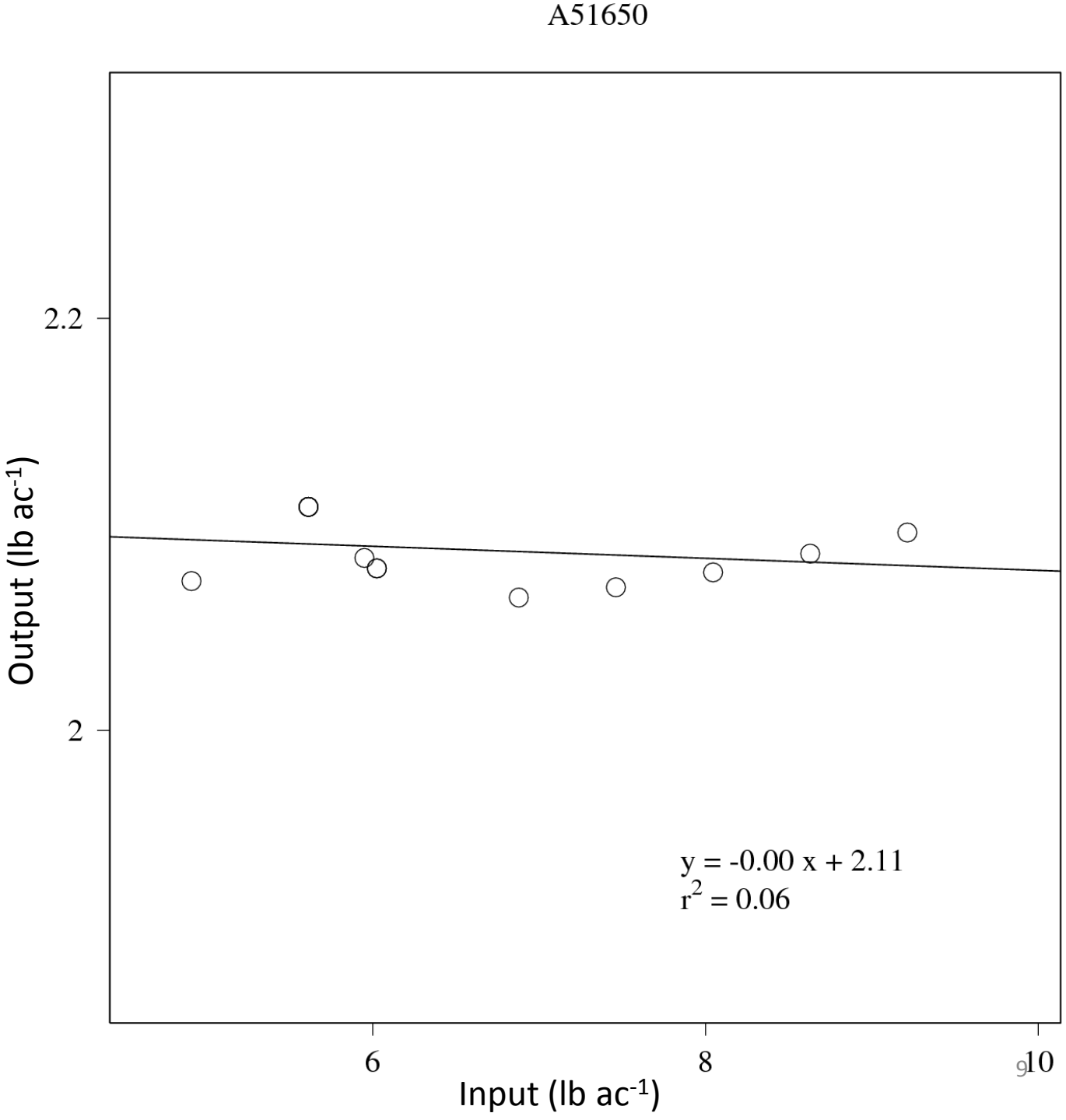
Total nitrogen output versus input



Almost no relationship between input and output.

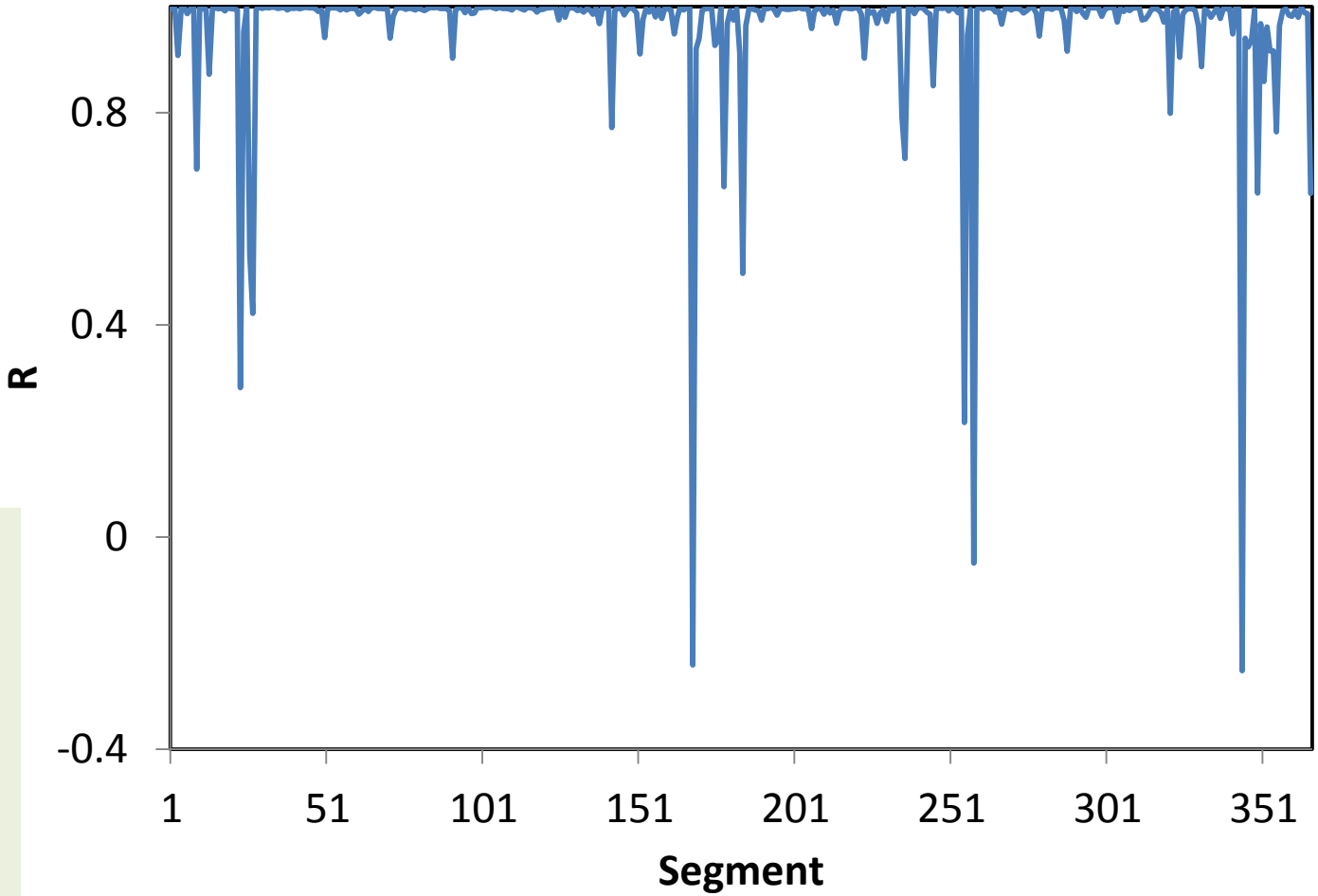
Negative correlation:

Total nitrogen output versus input



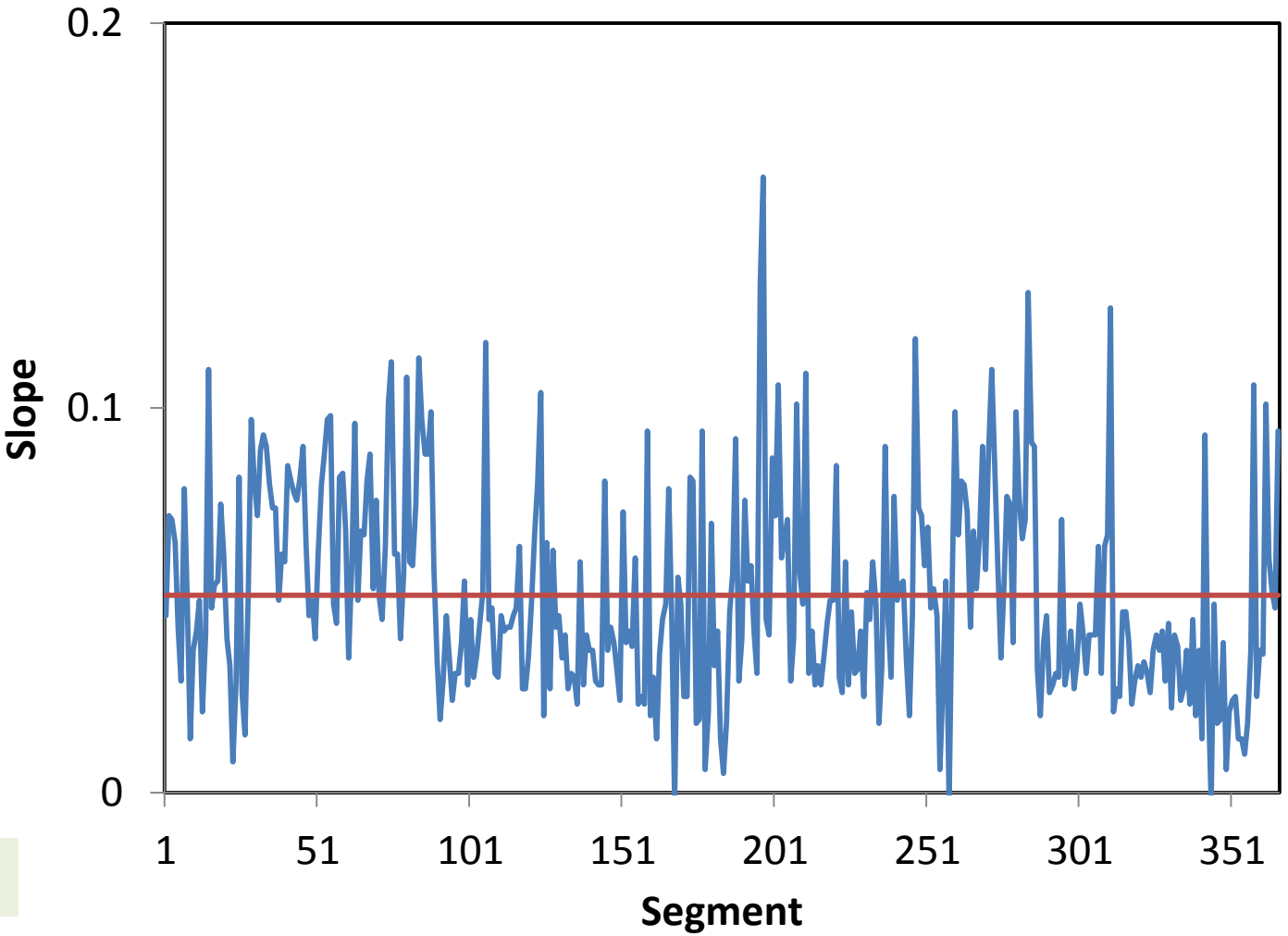
Slightly negative relation between input and output .

Correlation coefficient: Total nitrogen input and output (atmospheric deposition to forest)



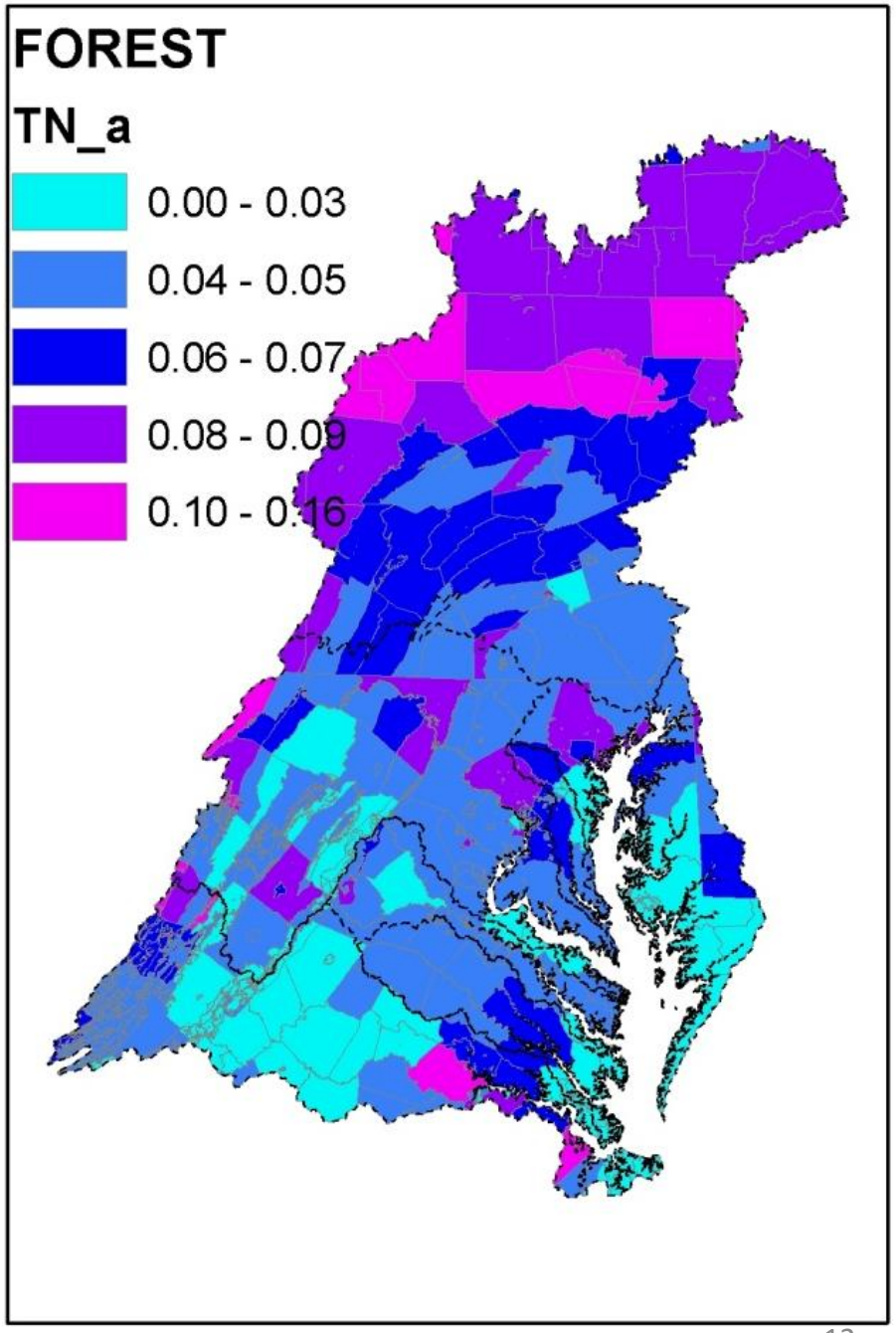
Most have a high correlation. Only a few do not. Linear should be a correct model (1.3% of R < 0.5)

Atmospheric deposition to forest: Slope between total nitrogen output and input



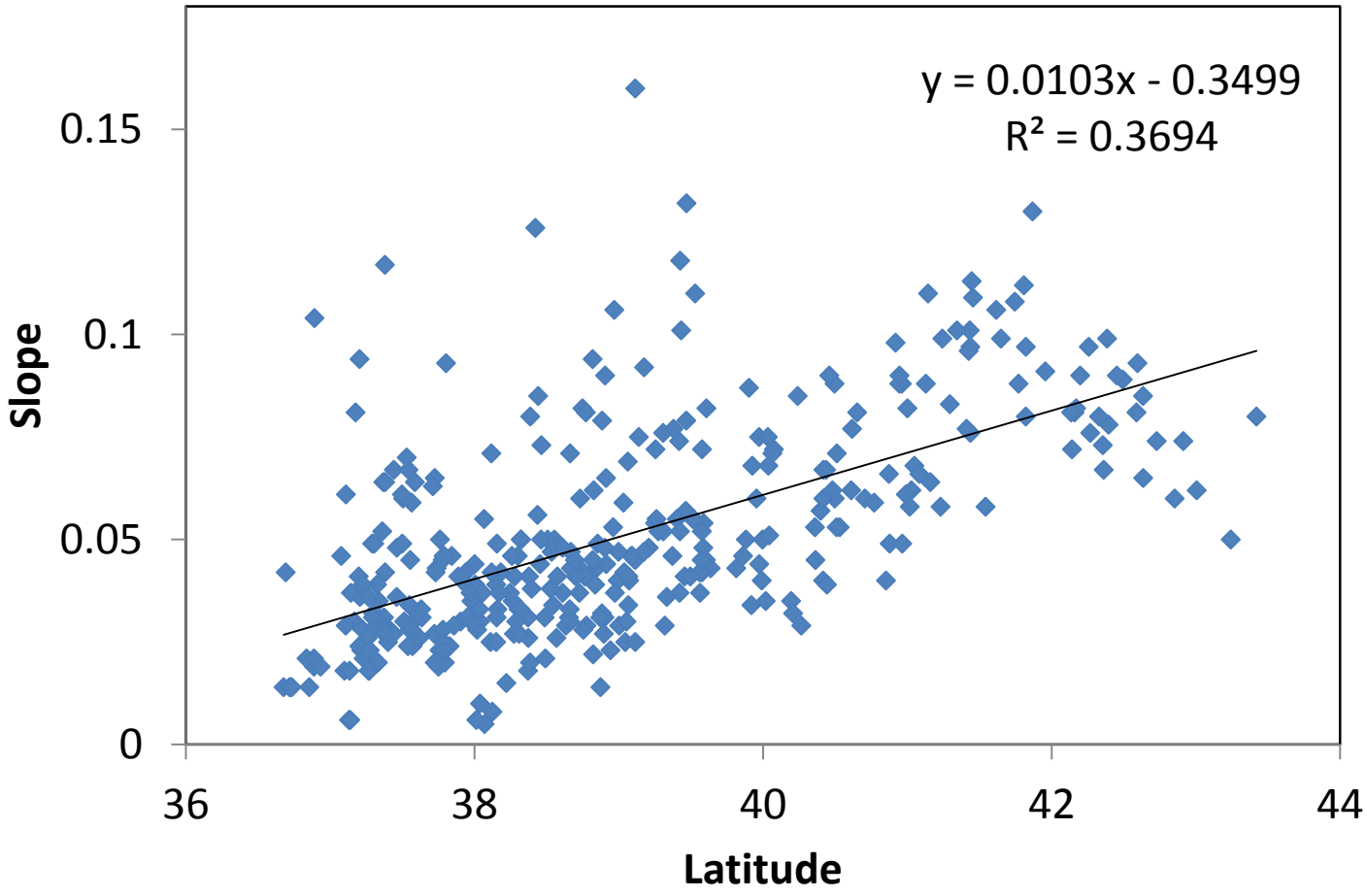
CV=0.58

Atmospheric deposition to forest: Regression slope between total nitrogen output and input

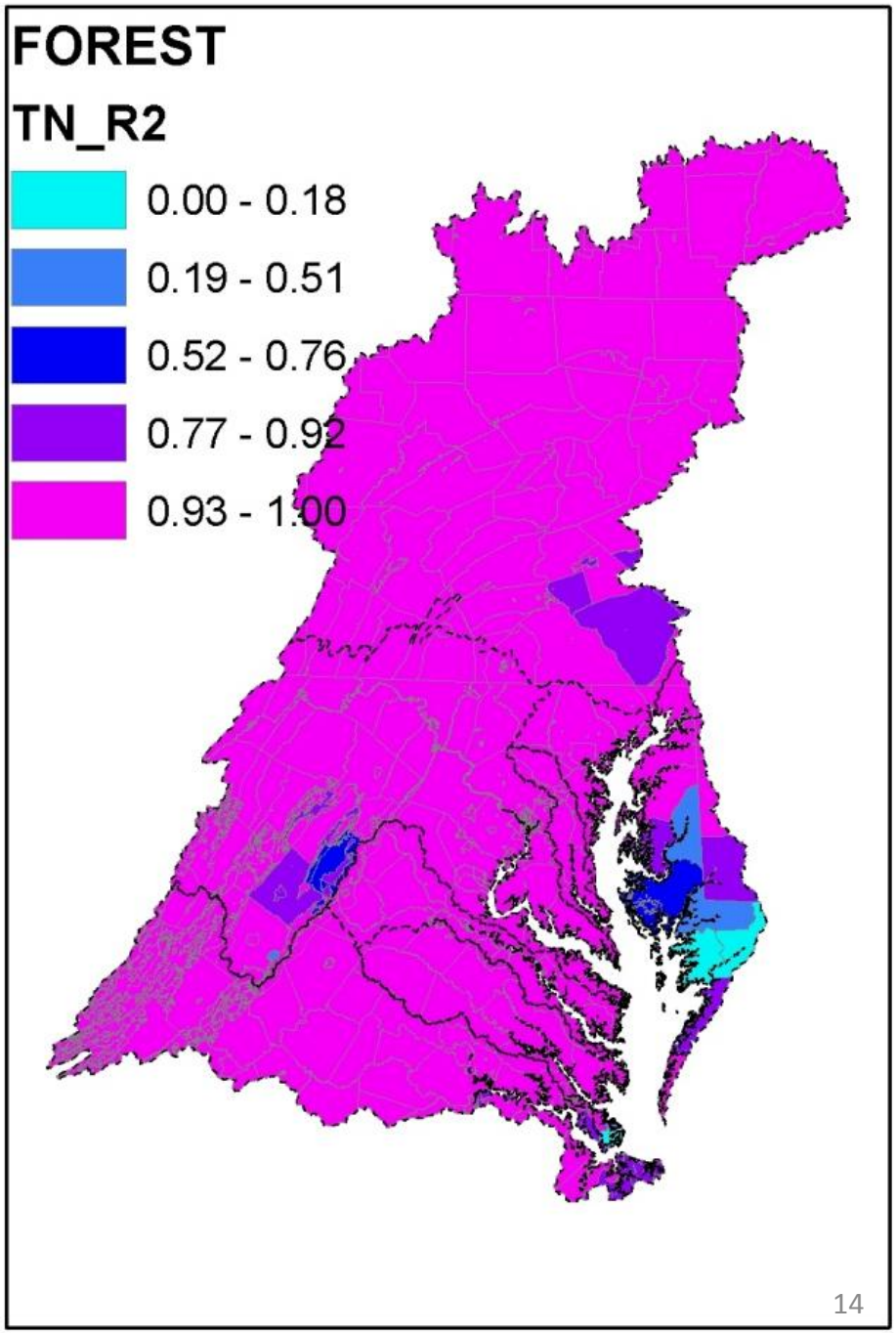


Seems related to latitude

Regression slope versus latitude



Atmospheric deposition to forest: Correlation coefficient between total nitrogen output and input

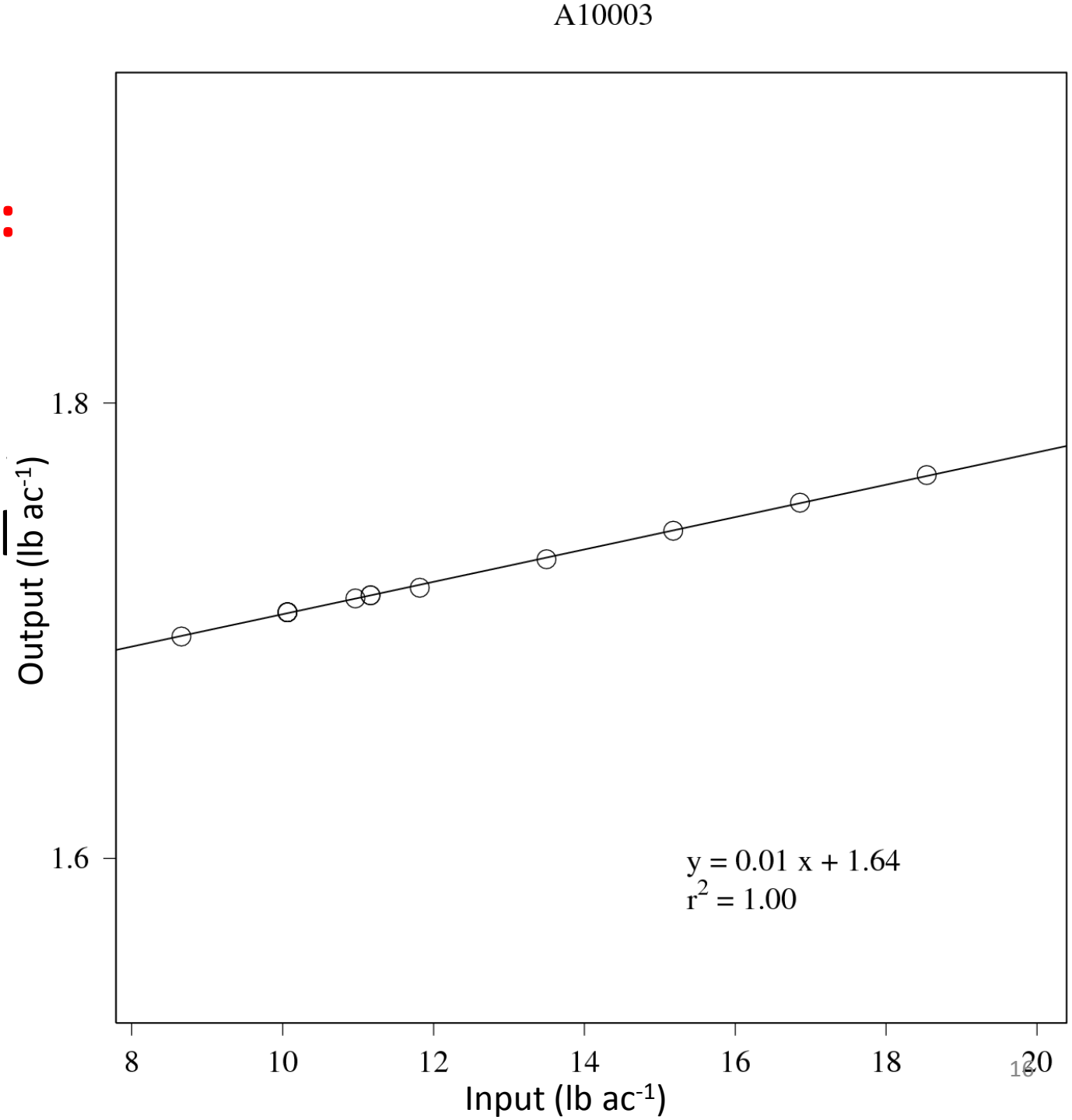


The agricultural areas (highest percent of ammonia) have the worst correlation

Atmospheric deposition to Forest
organic nitrogen output and total input

Good correlation:

Organic nitrogen output versus total input

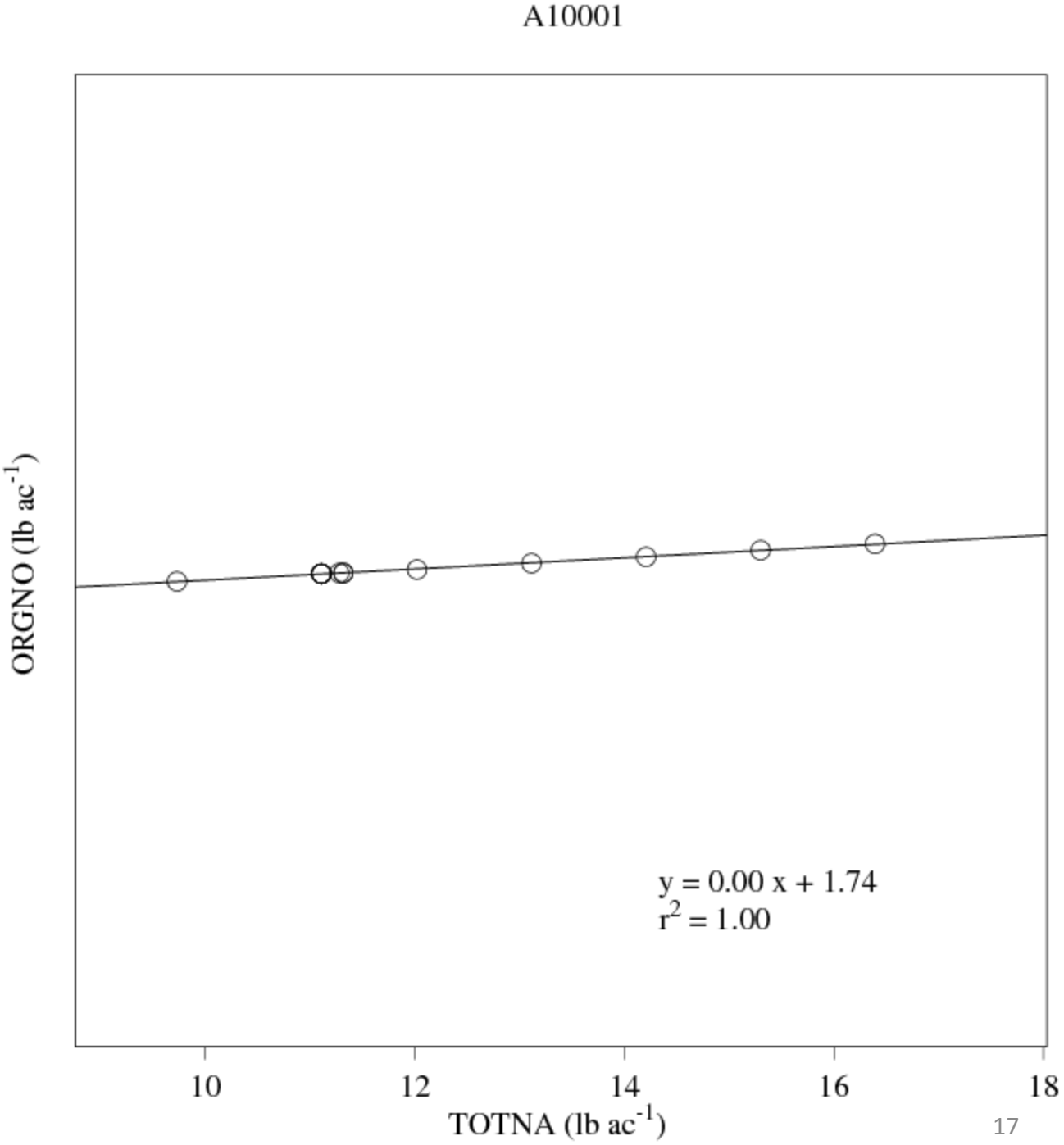


Strong linear relationship between output and input

Movie:

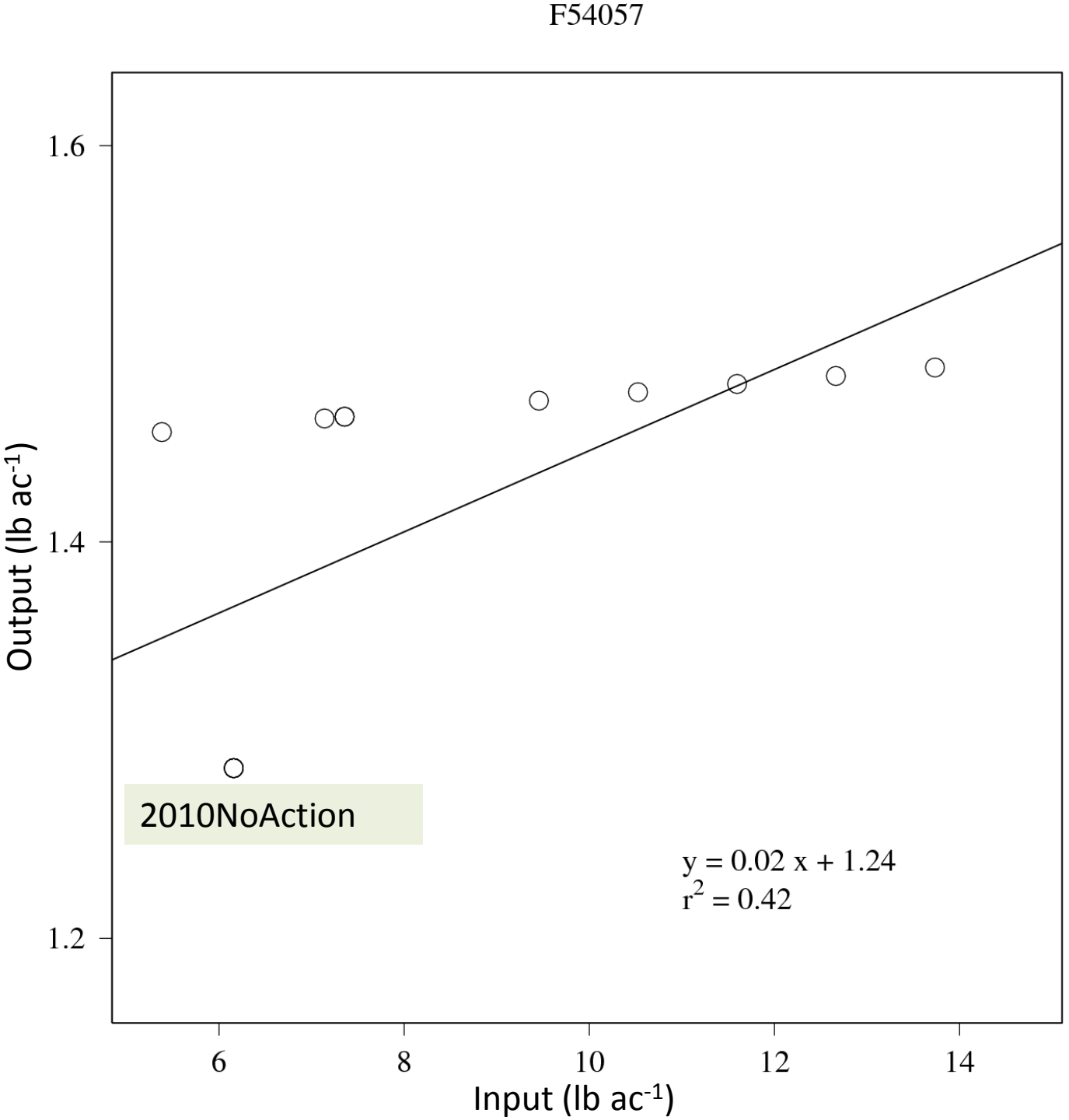
Organic nitrogen output versus total input

Most land segments have strong linear relationship between input and output.



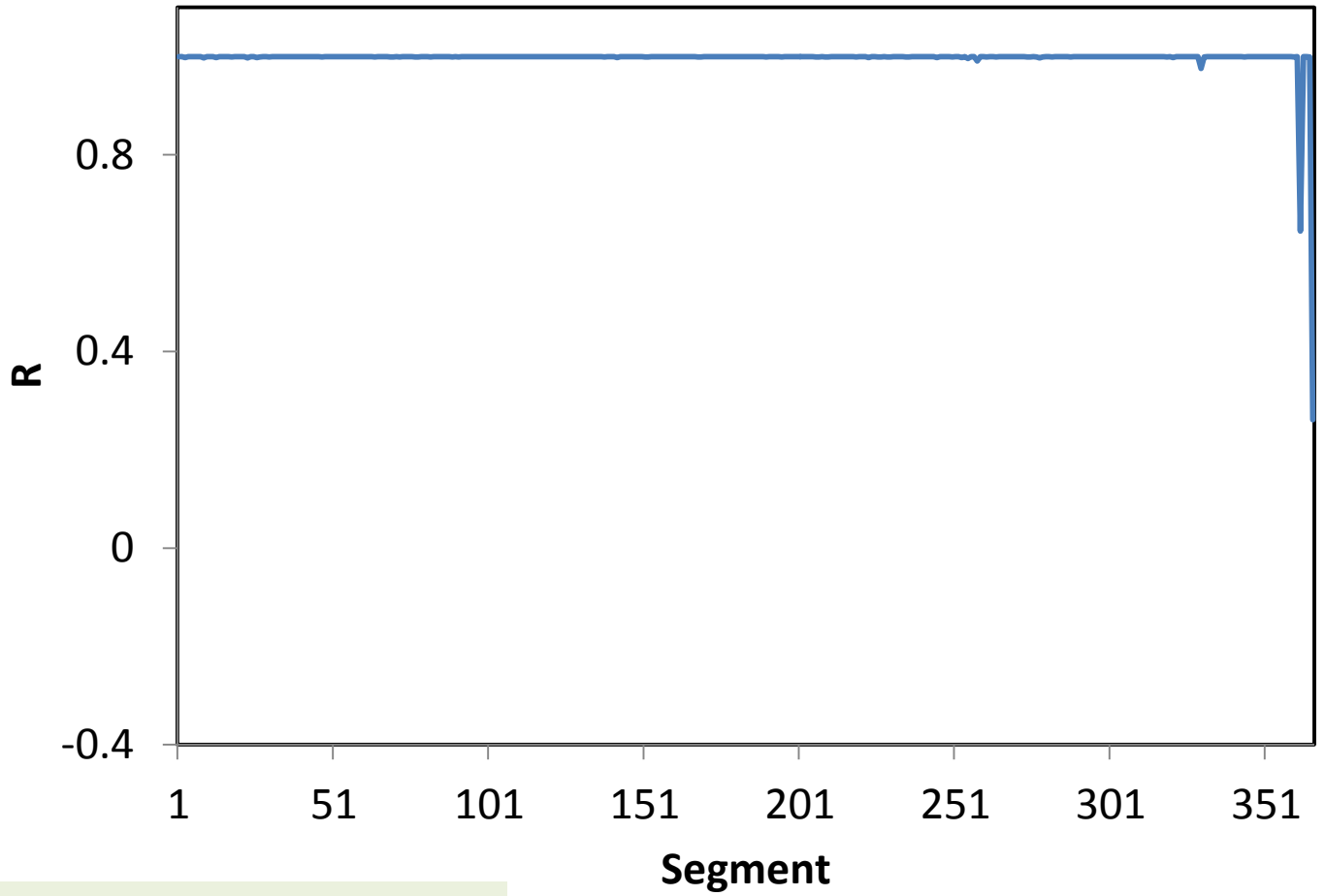
Weak Correlation

Organic nitrogen output versus tota input



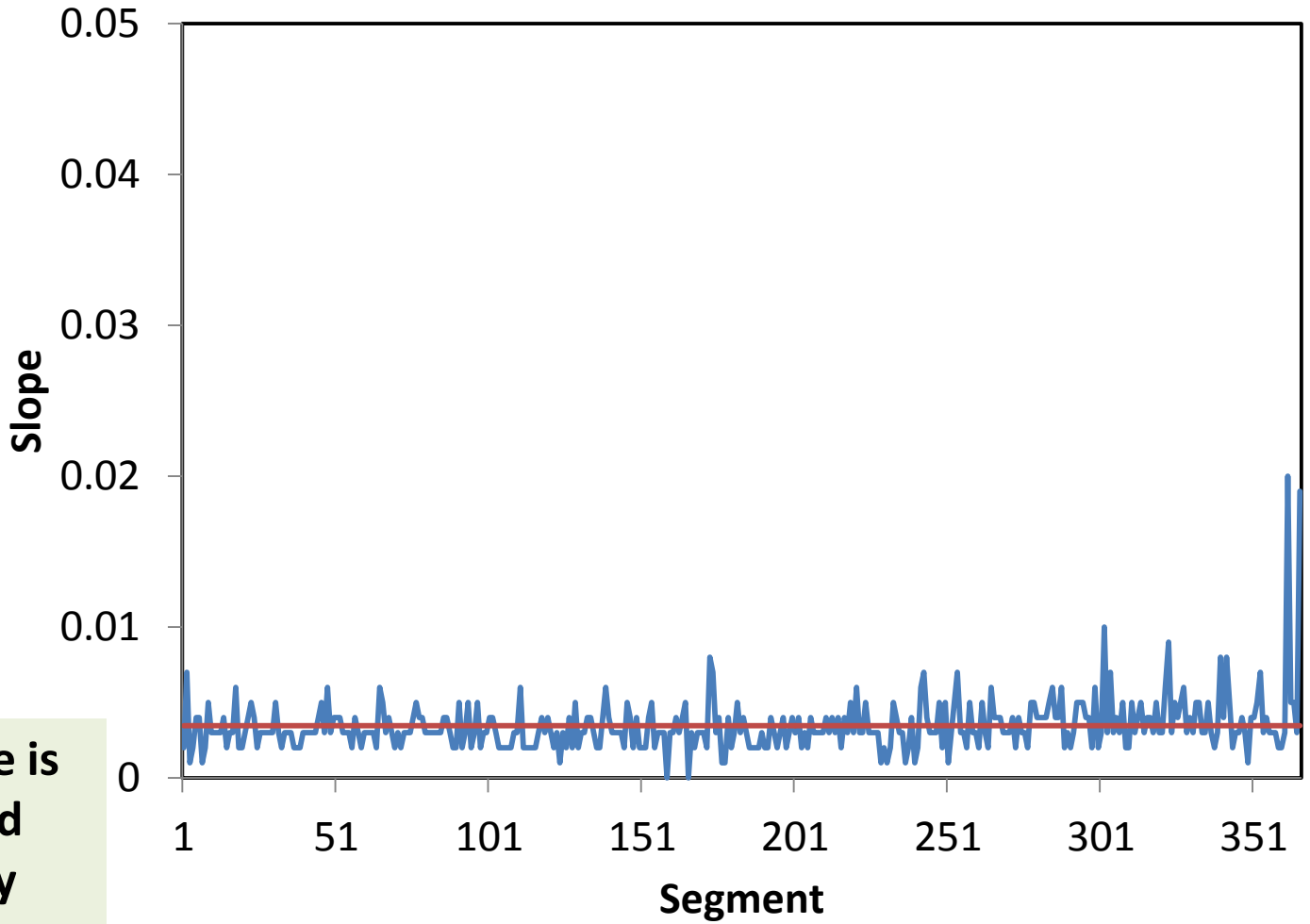
One outlier deteriorated the regression.

Correlation coefficient: Organic nitrogen output vs total input (atmospheric deposition to forest)



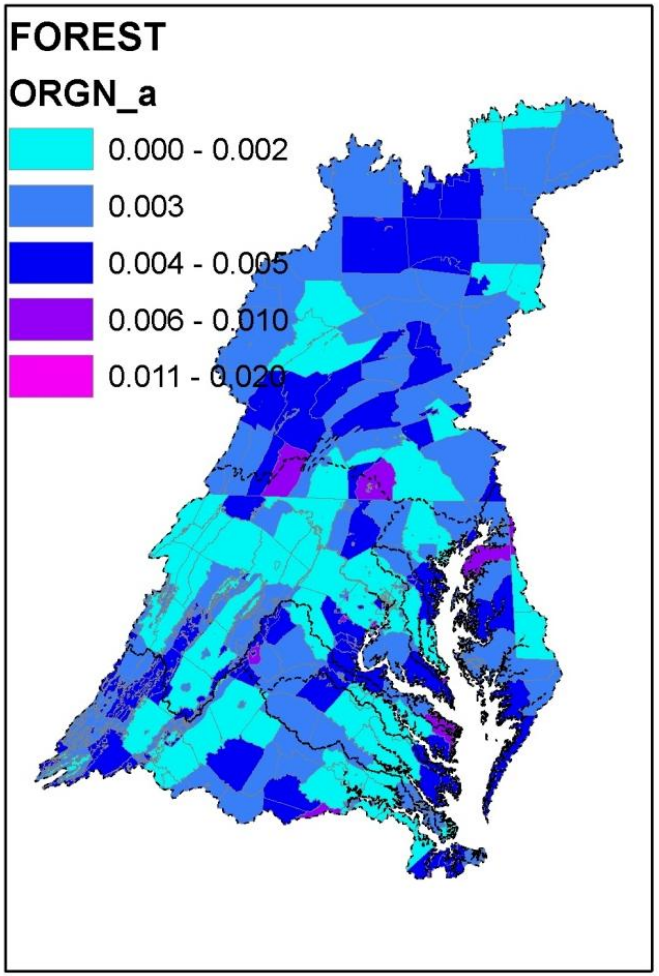
Strong linear relation dominating.

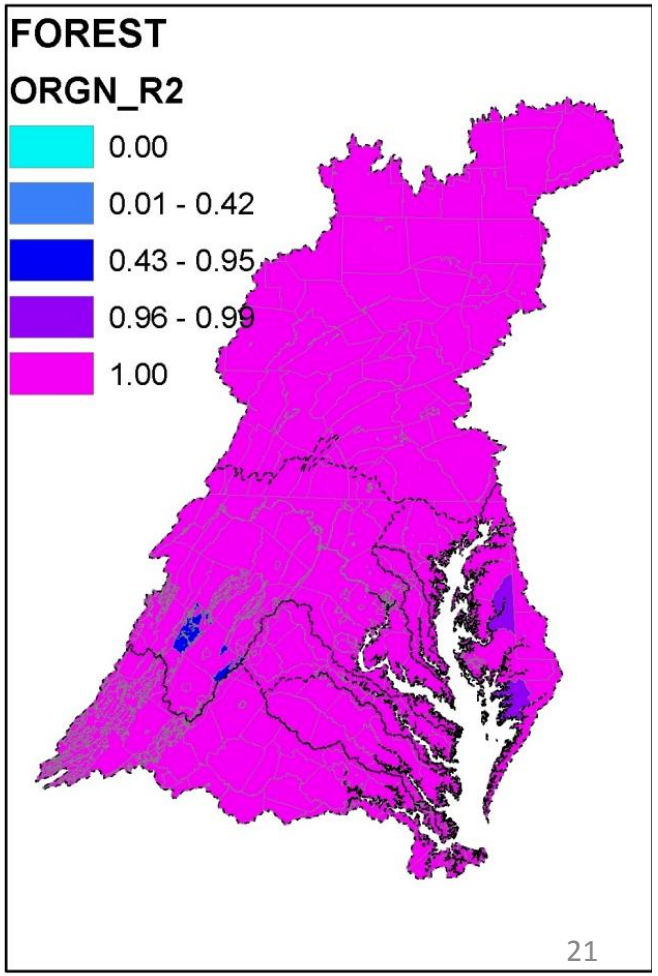
Atmospheric deposition to forest: Slope between organic nitrogen output and total input



the slope is small and relatively constant

Atmospheric deposition to forest: Regression slope and correlation coefficient between organic nitrogen output and total input





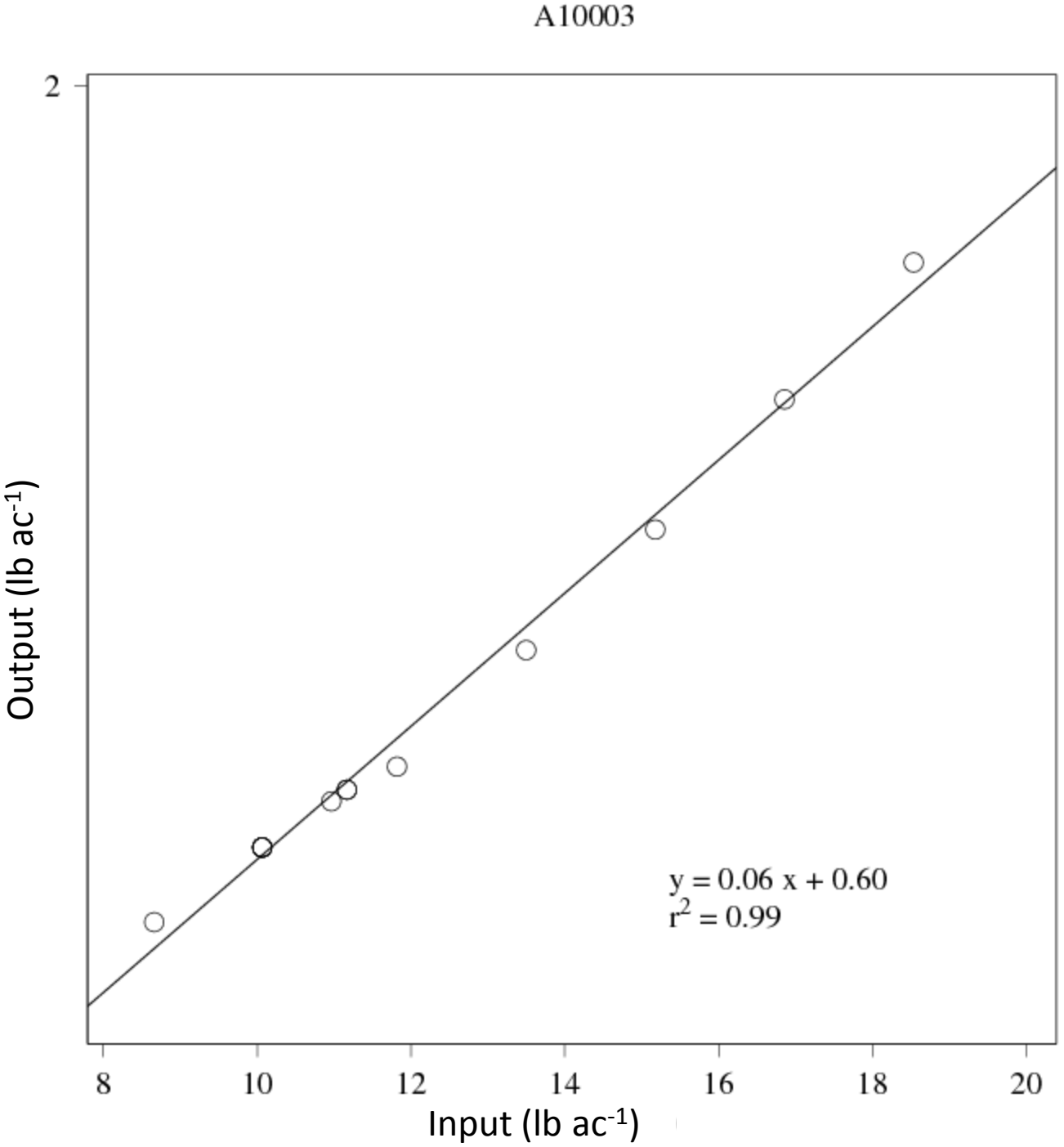
No geographic signature to the slope

A constant slope (average=0.0034) should be used?

Atmospheric deposition to Forest
DIN output and total input

Good correlation:

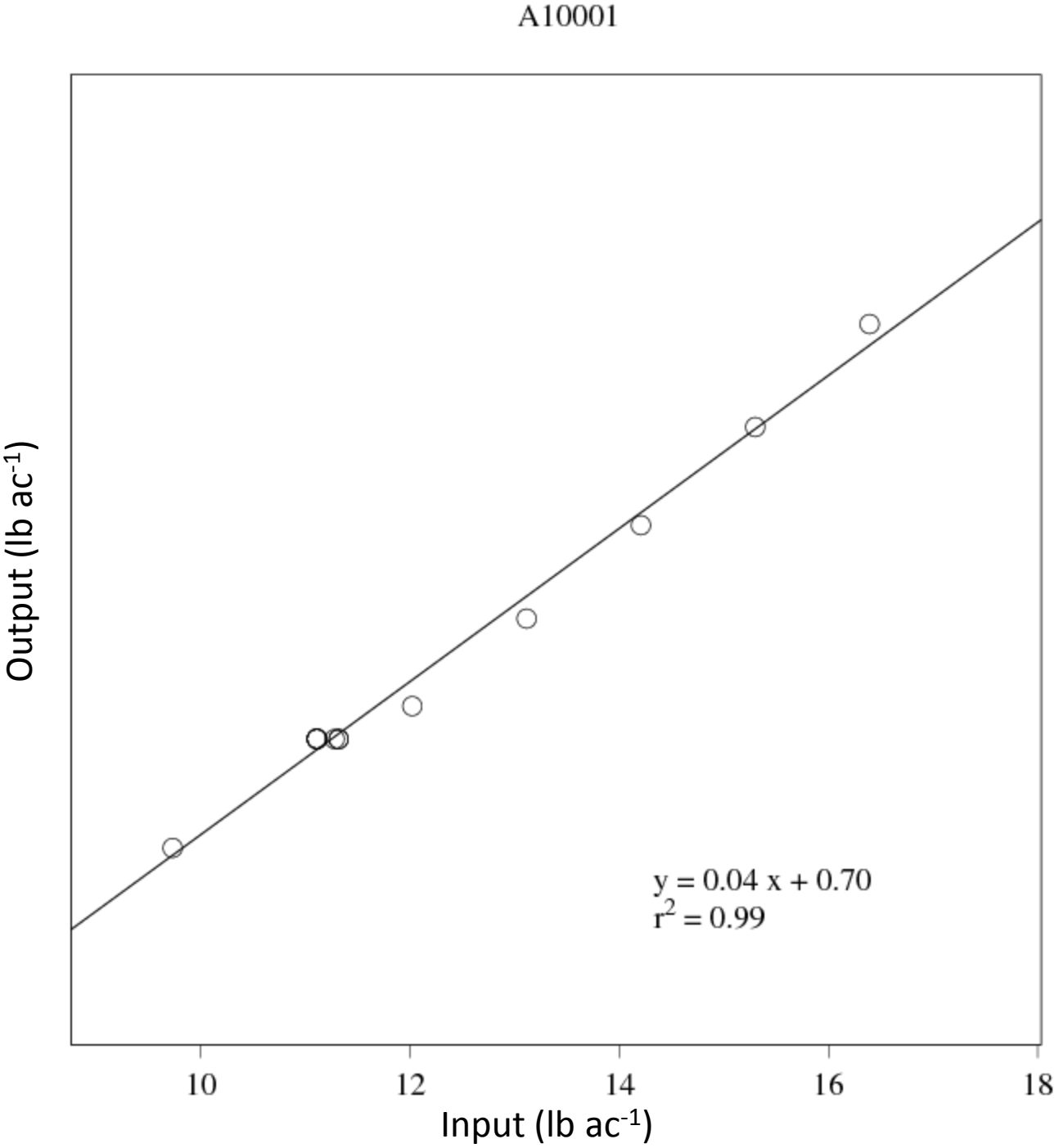
DIN output versus total input



Strong linear relationship between output and input

Movie:

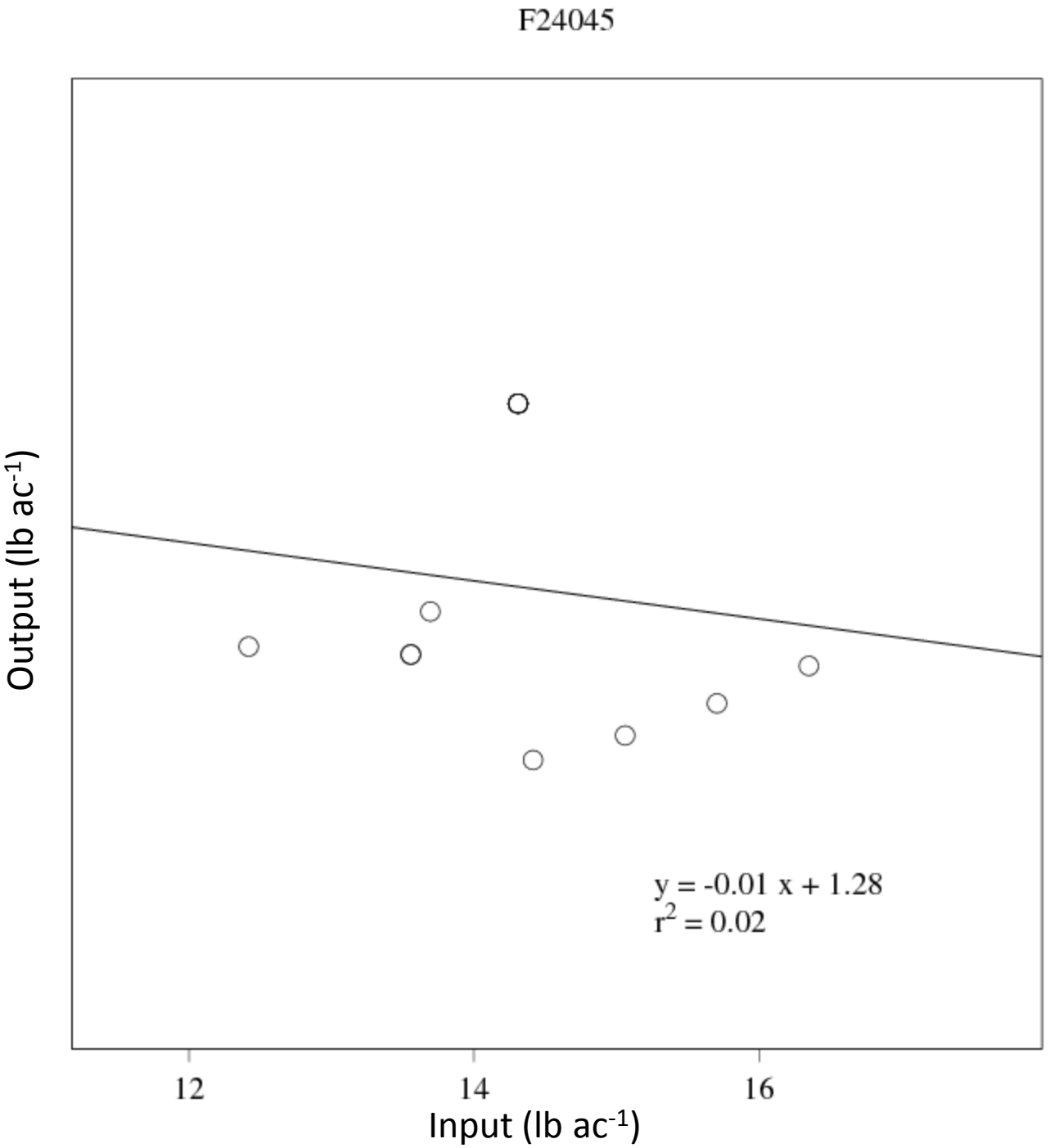
DIN output versus total input



Most land segments have strong linear relationship between input and output.

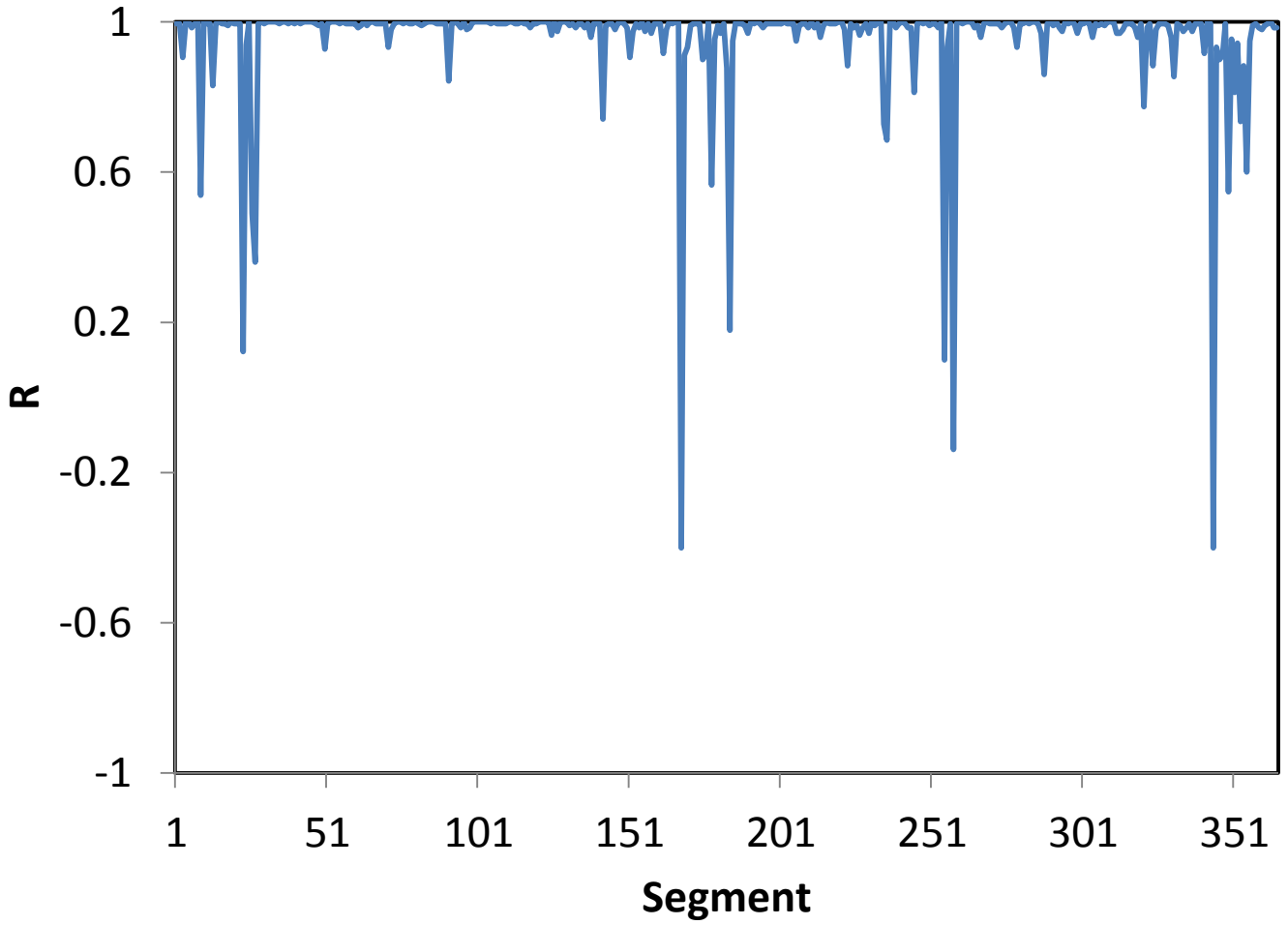
Weak correlation:

DIN output versus total input



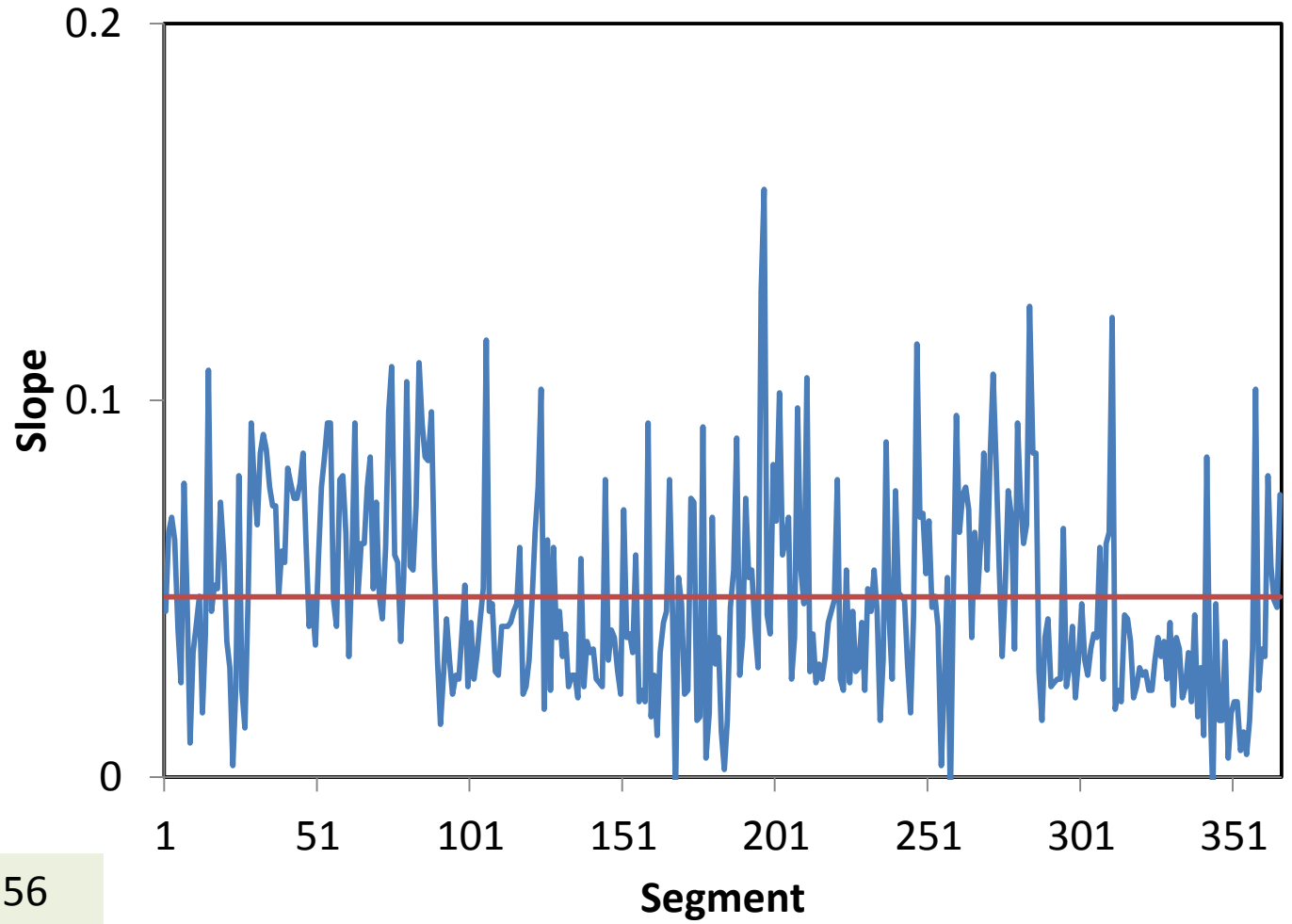
Slightly negative relationship.

Correlation coefficient: DIN output vs total input (atmospheric deposition to forest)



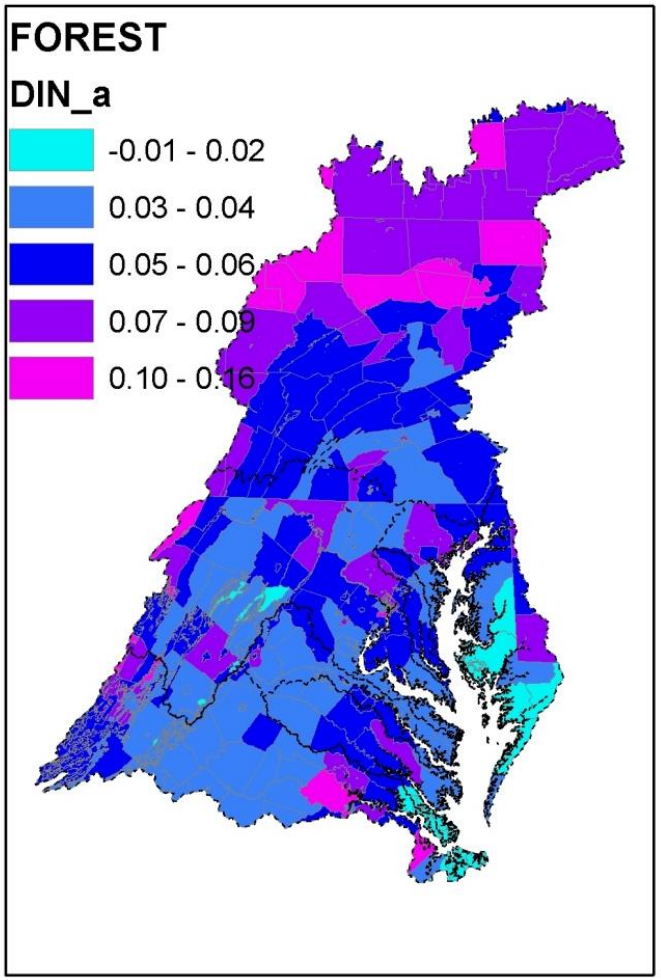
Most have a high correlation. Only a few do not. Linear should be a correct model (1.9% R < 0.5)

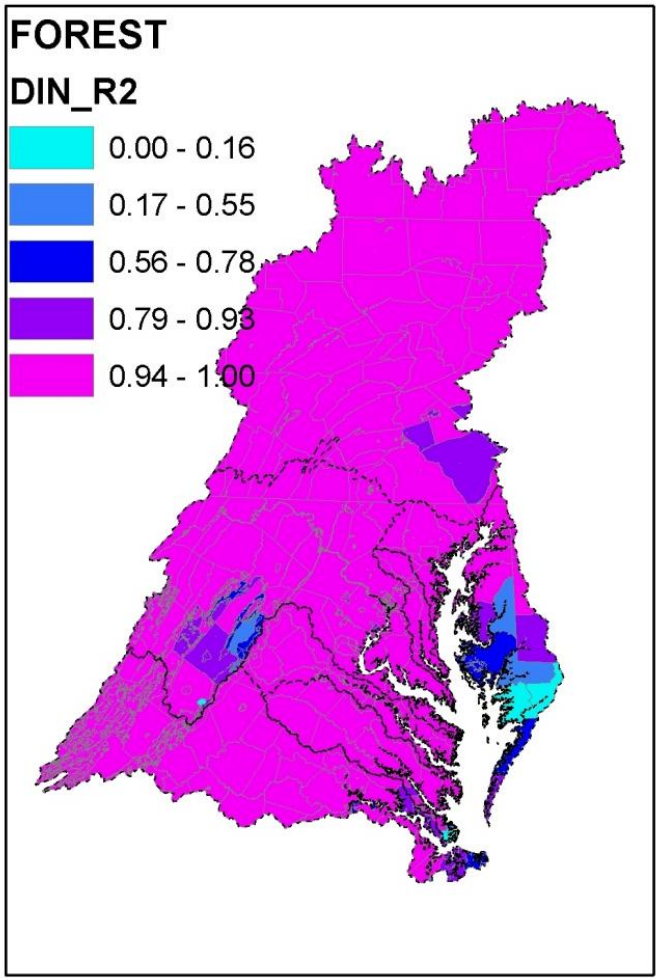
Atmospheric deposition to forest: Slope between DIN output and total input



CV=0.56

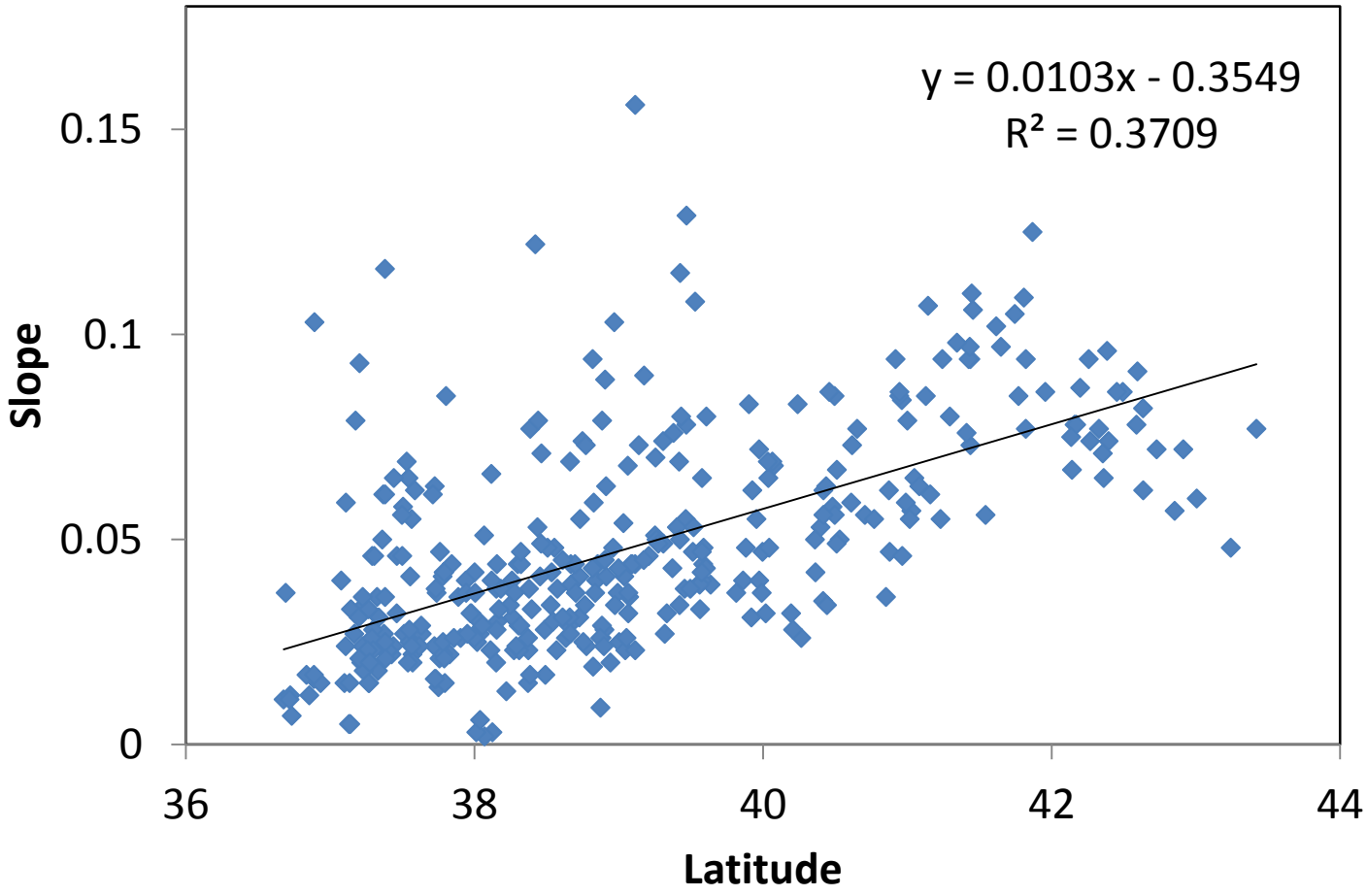
Atmospheric deposition to forest: Regression slope and correlation coefficient between DIN output and total input





Again, there is a latitudinal gradient.

Regression slope versus latitude

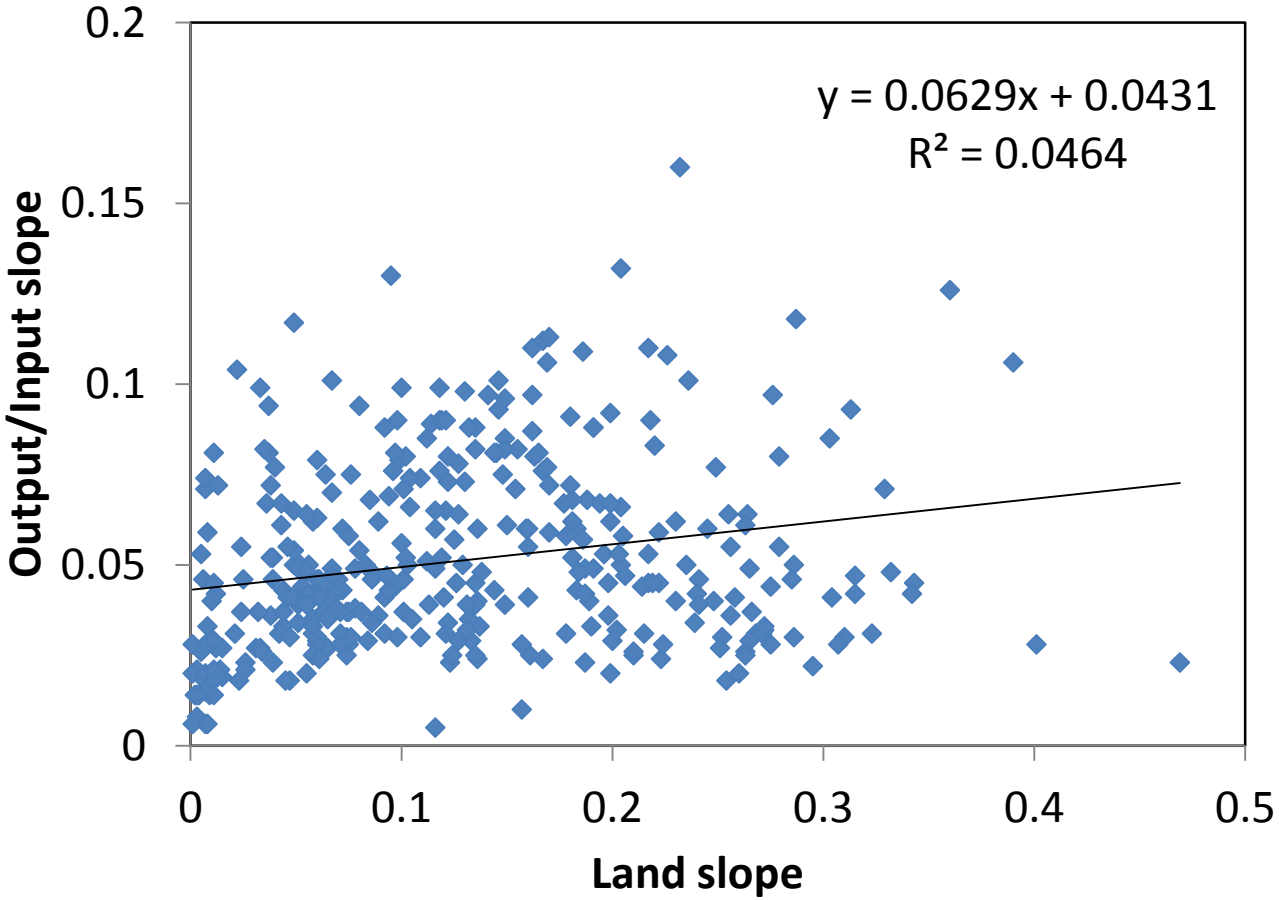


Conclusions relative to the AGCHEM simulation of forest

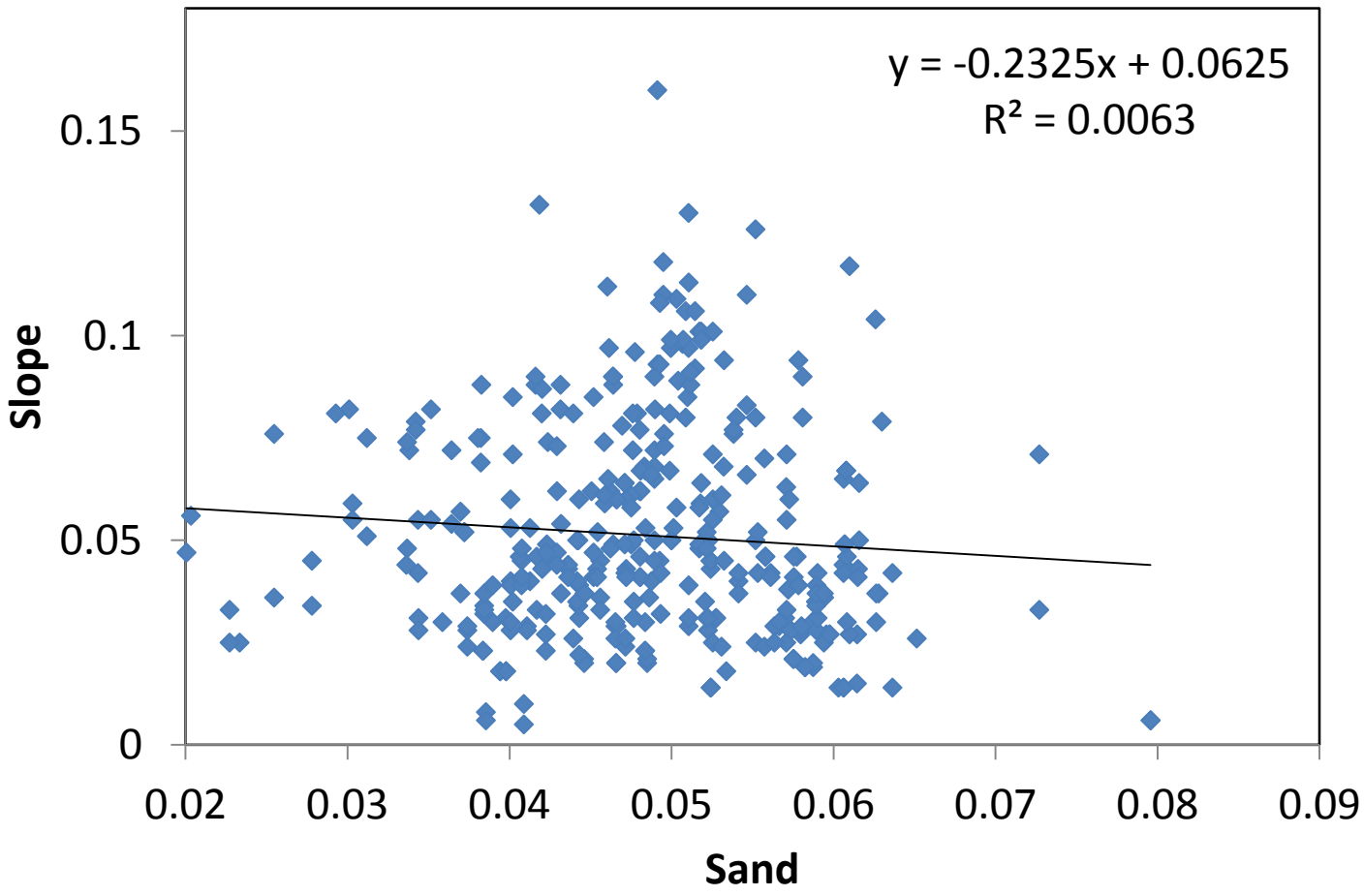
- Forest exports are linearly related to inputs
- Organic exports are linearly related with a low slope that can be appropriately modeled as constant for all segments
- DIN exports are linearly related to inputs. The slope of the relationship is related to the latitude.

THE END

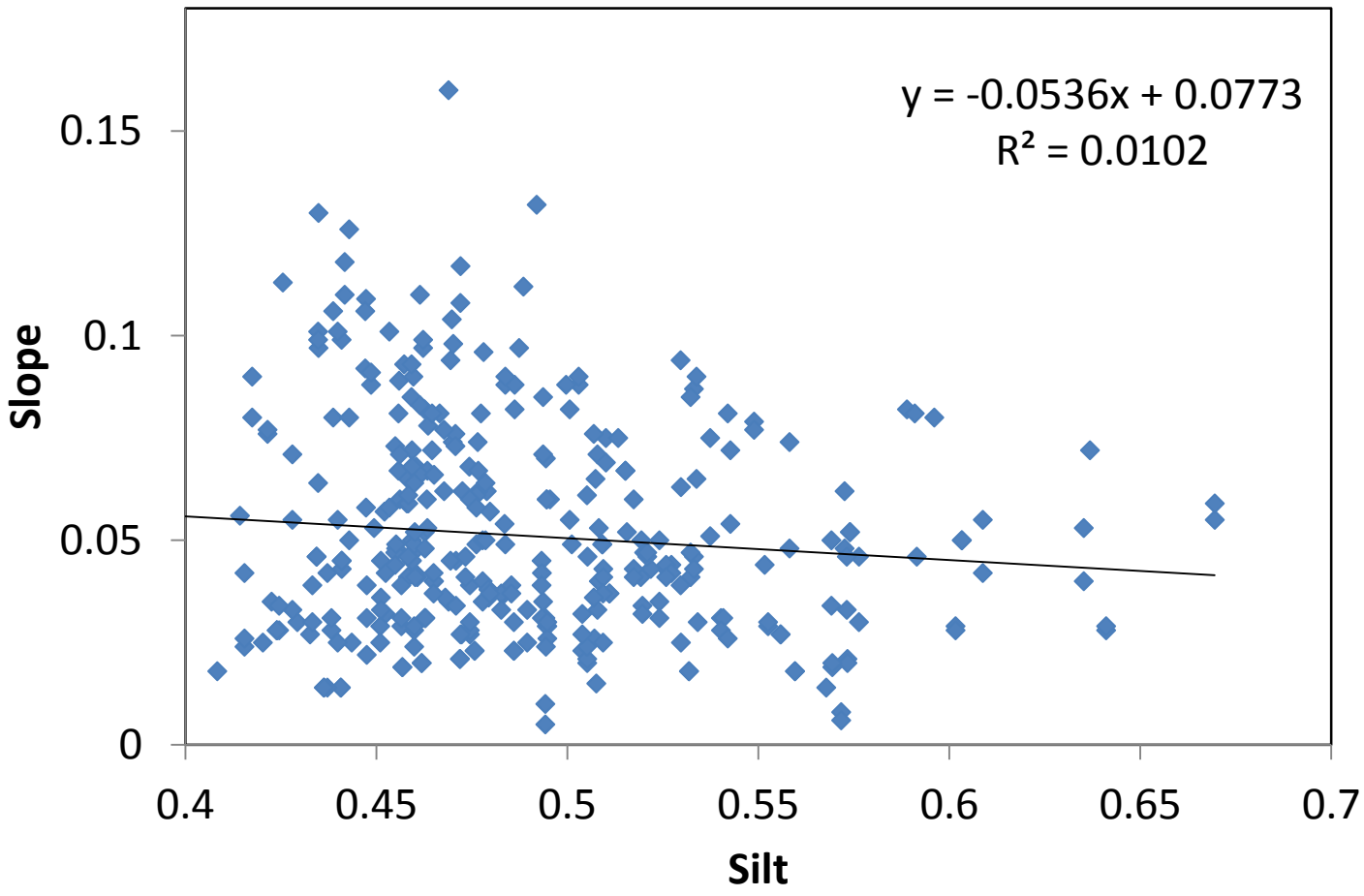
Regression slope versus land slope



Regression slope versus Sand



Regression slope versus silt



Regression slope versus clay