High School Science Teachers and Forestry Education: How Are They Connected?

Shannon Fowler
John Munsell
John Seiler
Virginia Tech

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Outline

- Background/Objectives
- Methods
- Results
  - Who responded?
  - What are their connections to forestry?
  - Attitudes toward forestry education and forest management
  - Frequency that forestry concepts are taught and predictors
  - Frequency of field trips to forests and predictors
- Conclusion

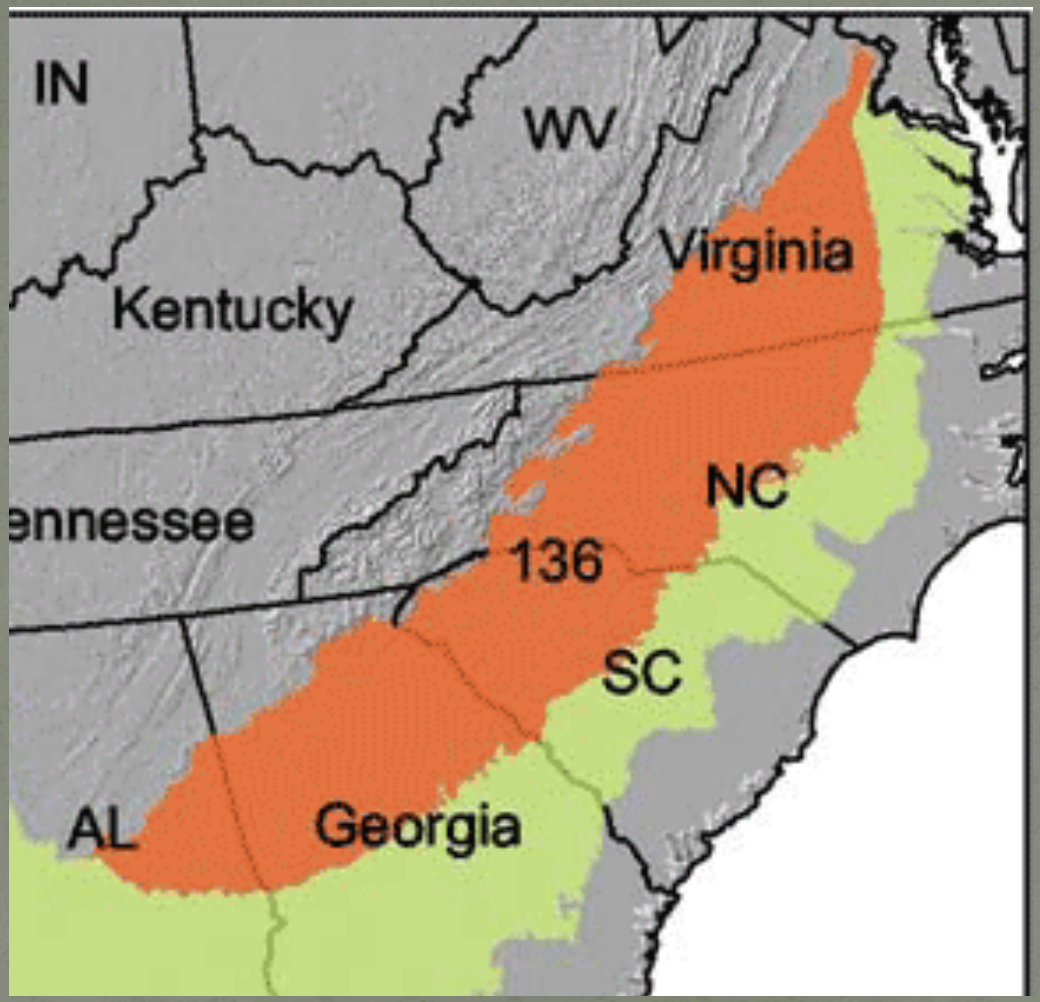
Background

- Increasing need for:
  - Natural resource managers
  - Public involvement
  - Education about natural resources
- What is being taught?
  - Evidence of students having misconceptions
  - Decline in enrollment

Objectives

- To determine the extent to which high school science teachers in the Southern Piedmont region are teaching forestry concepts in the classroom.
- To determine variables that predict the frequency that teachers present forestry concepts in the classroom.
- To determine the frequency that teachers take field trips to forests for educational purposes.
- To determine teaching variables that predict whether or not teachers take field trips to forests for educational purposes.

Participants



From: http://www.mo15.nrcs.usda.gov/technical/MLRAs/mlra_136.html

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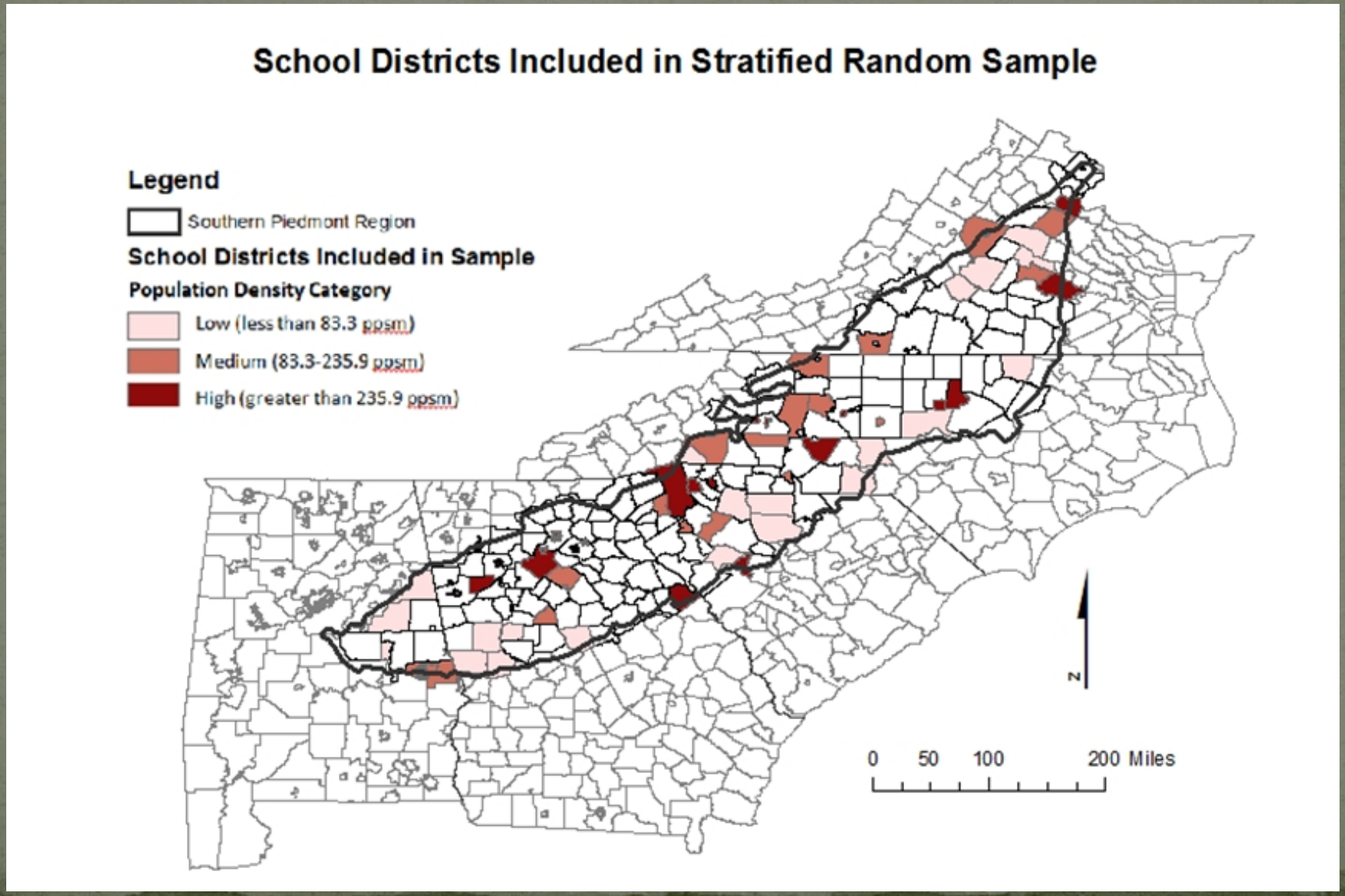
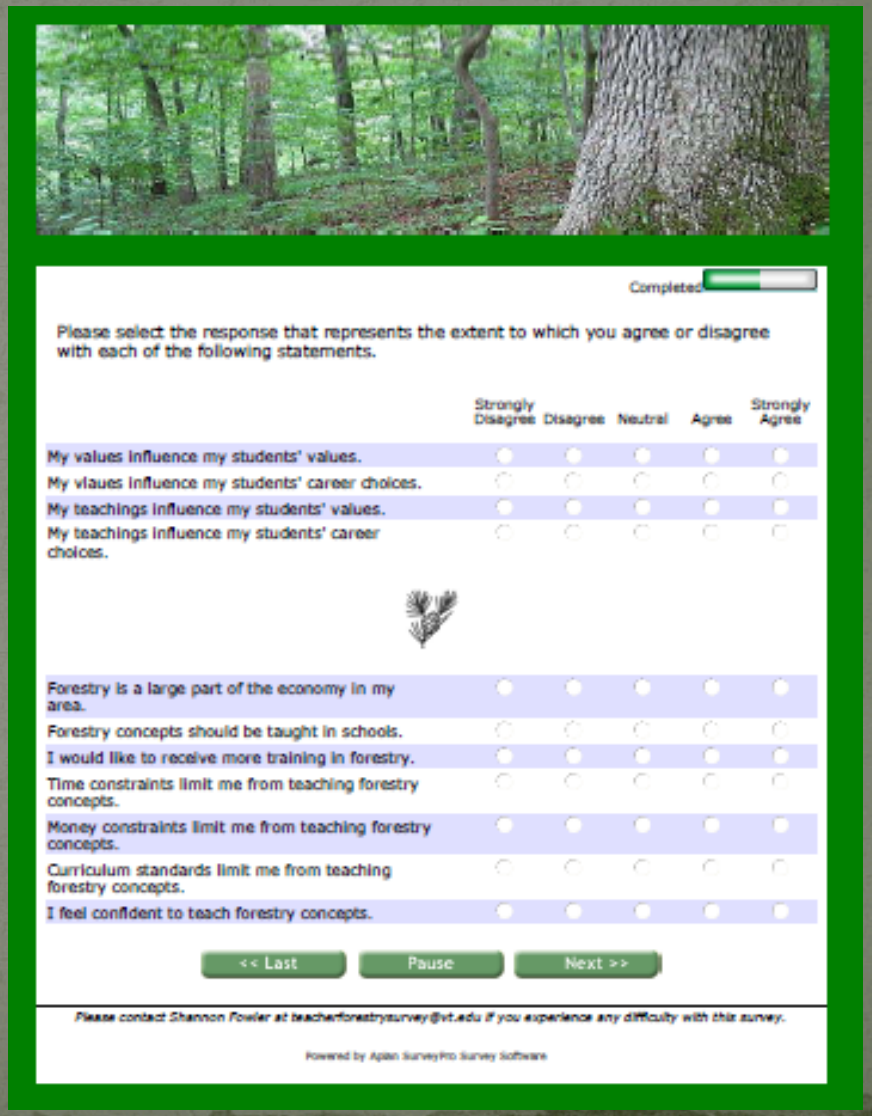


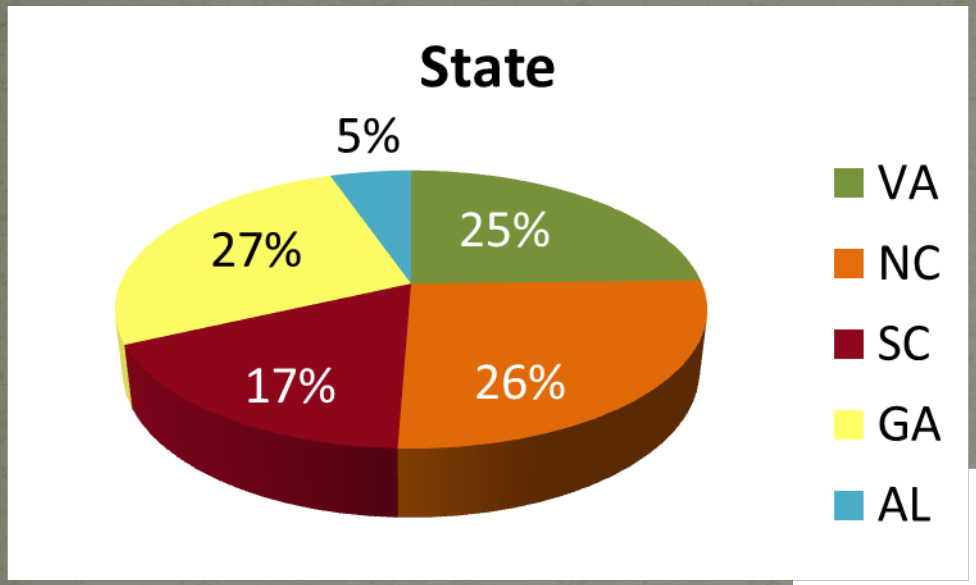
Instrument/Response Rate

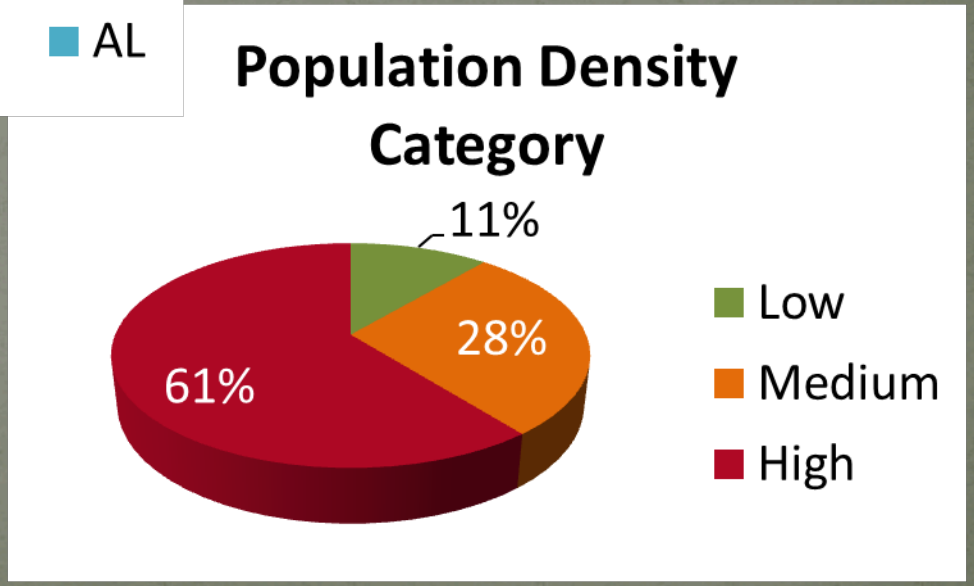
- Web-based survey with e-mail invitation and reminders

- Response rate: **34%**
  - 1095 surveys sent
  - 71 not delivered
  - 324 completed



Who Responded?





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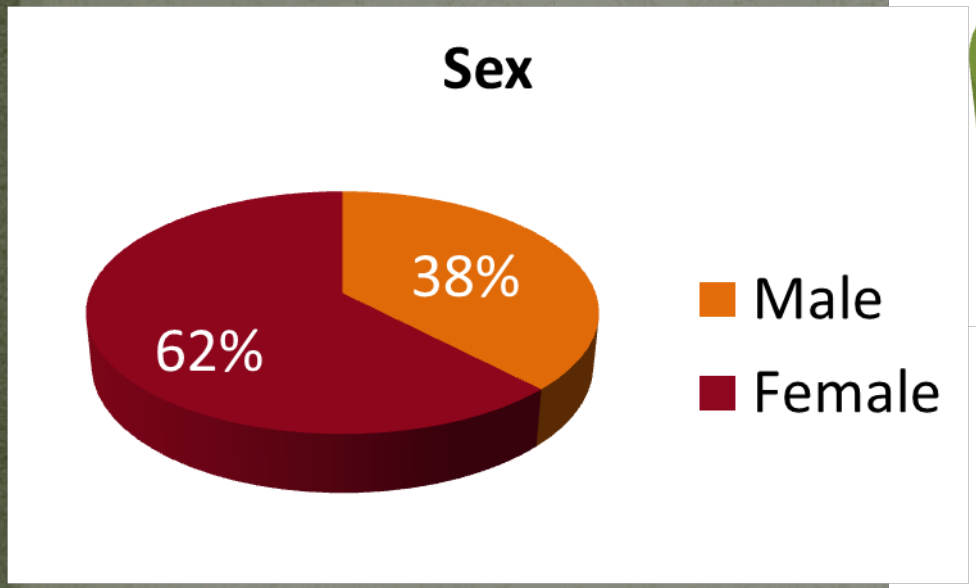

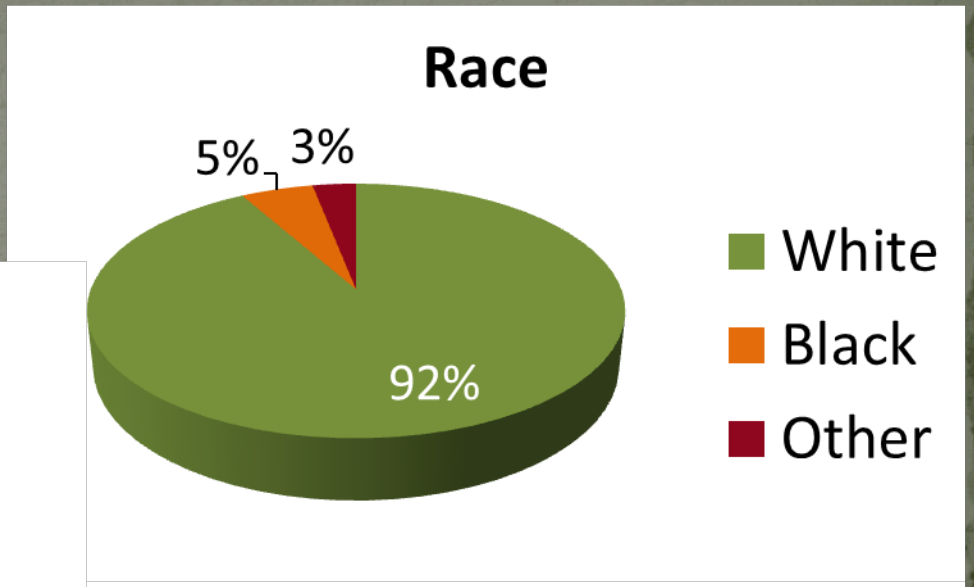

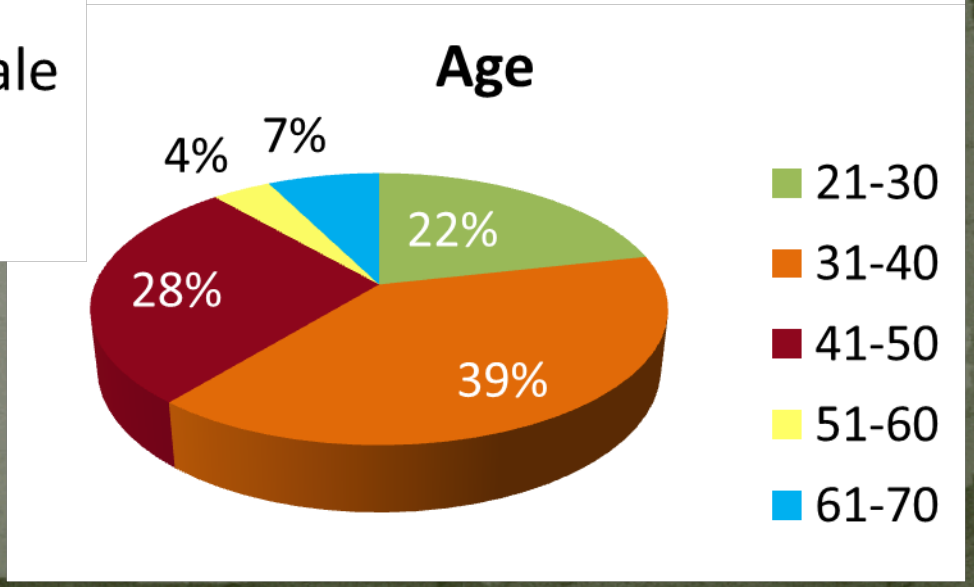

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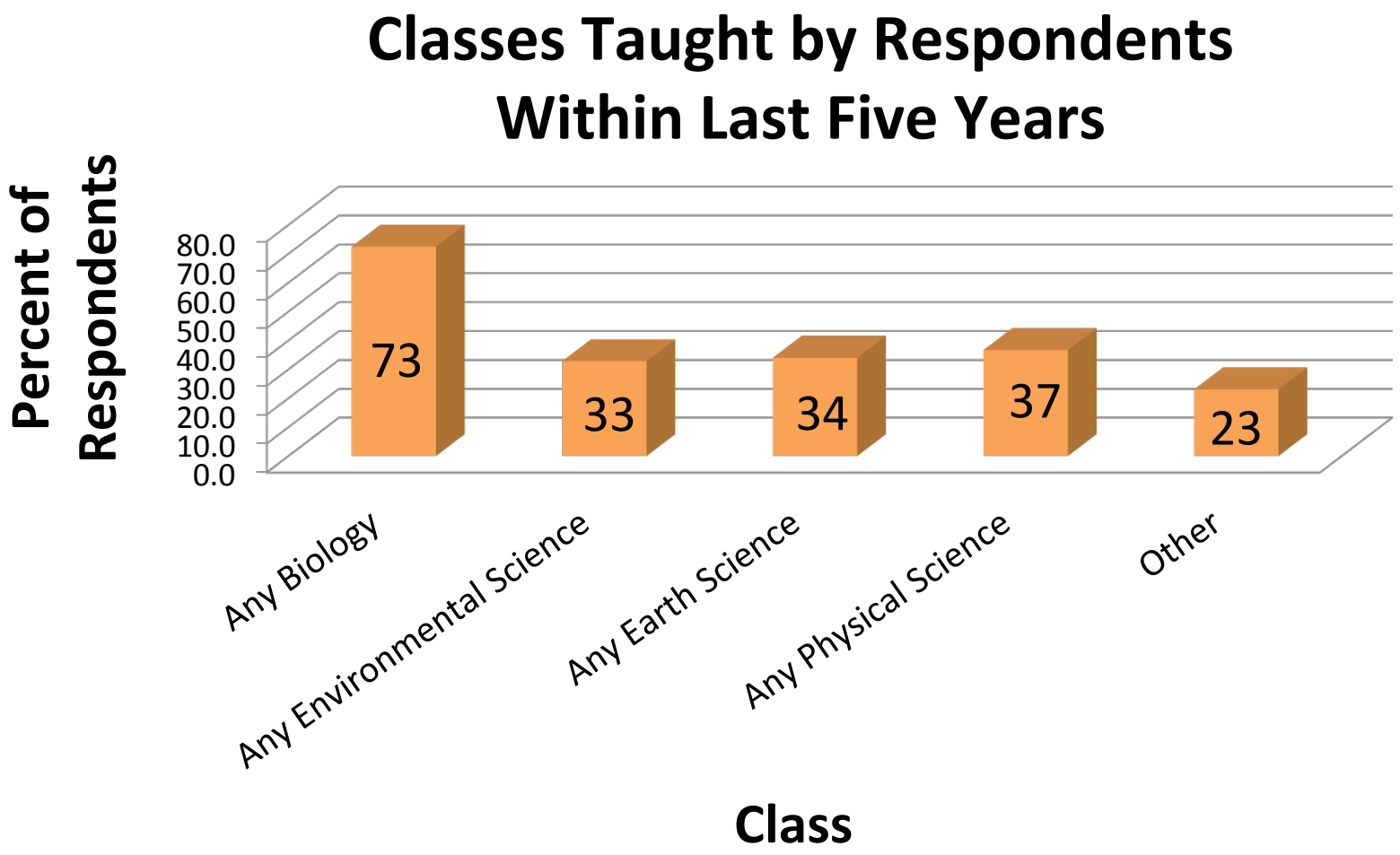

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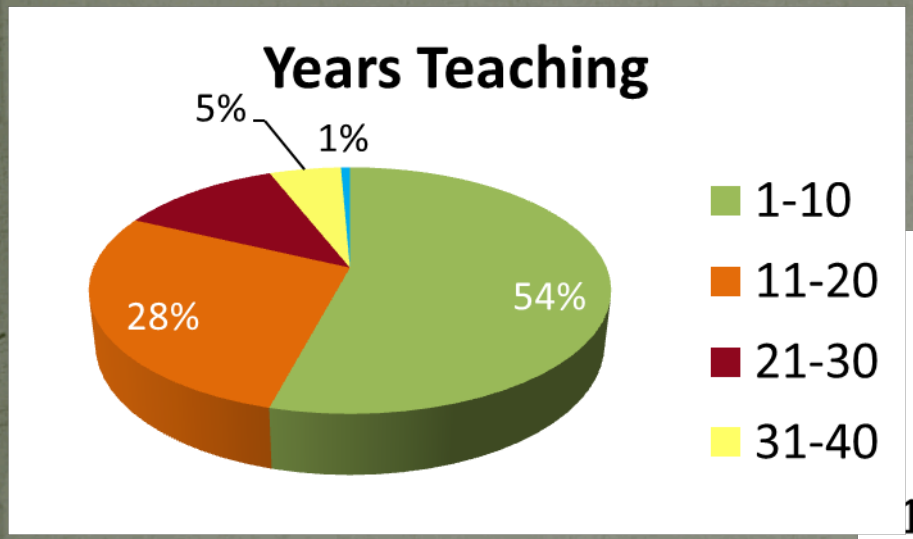
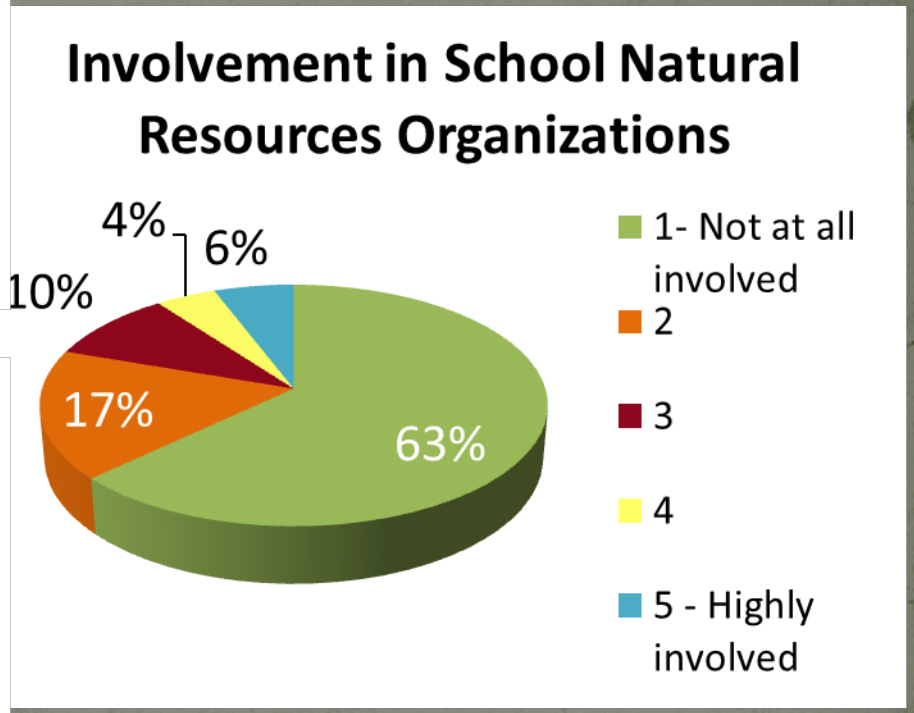
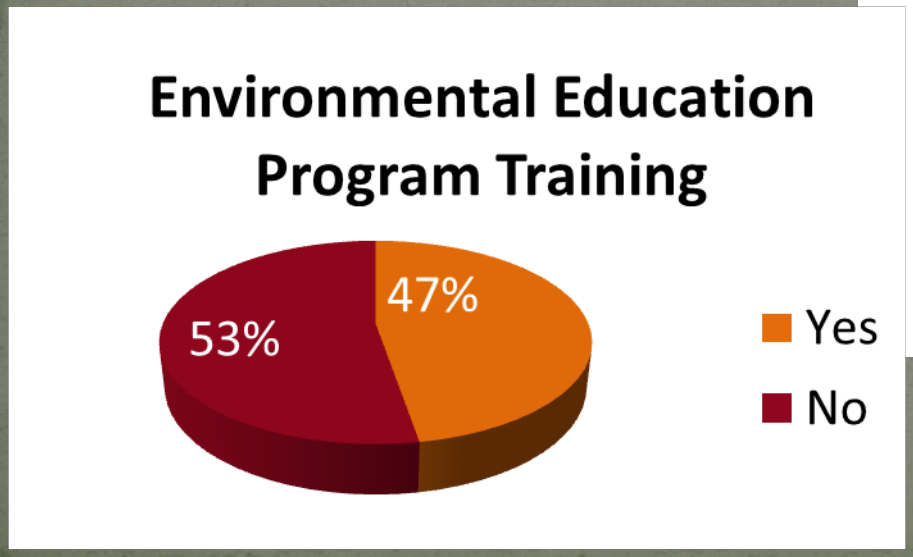
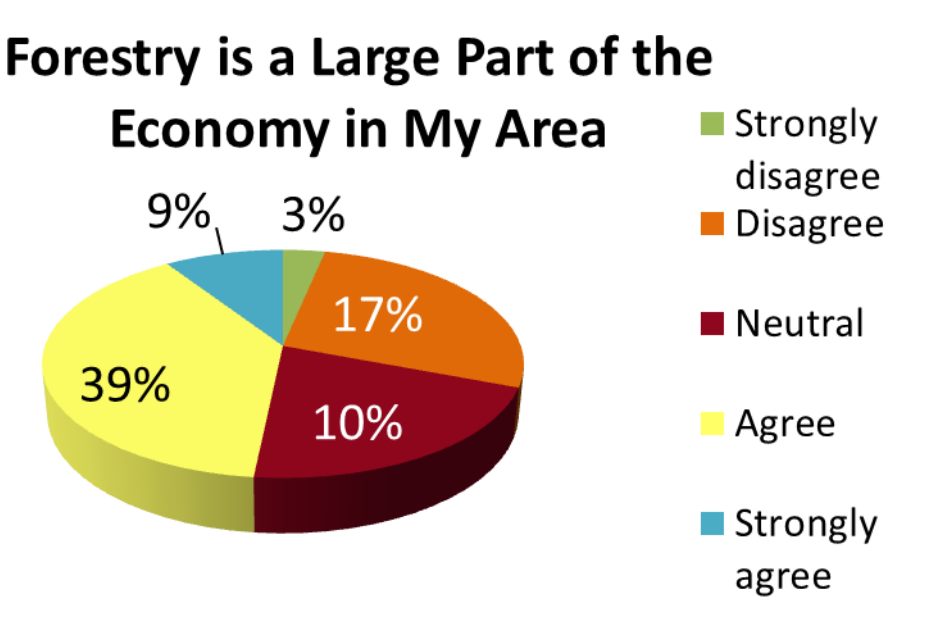
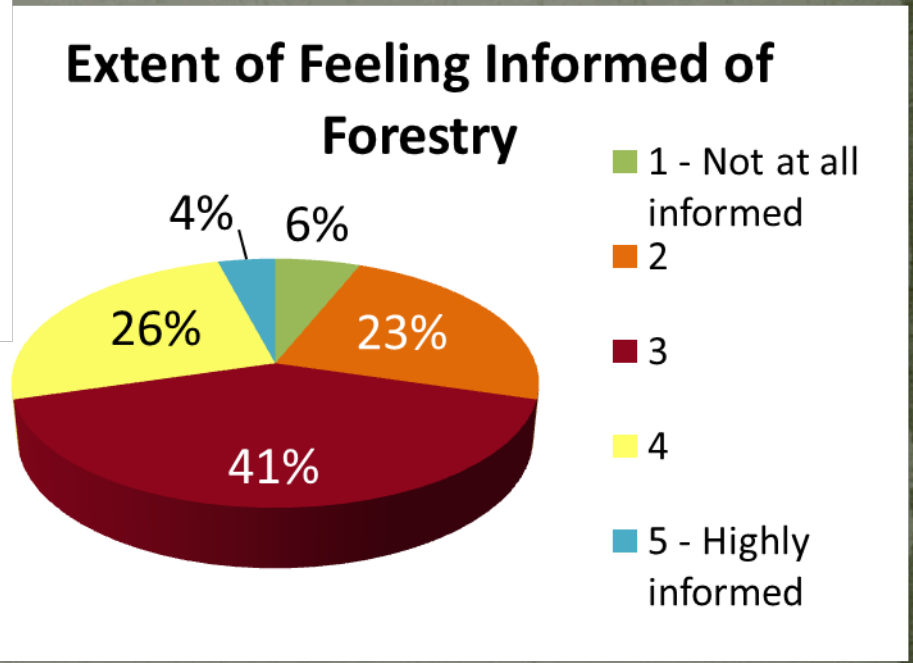


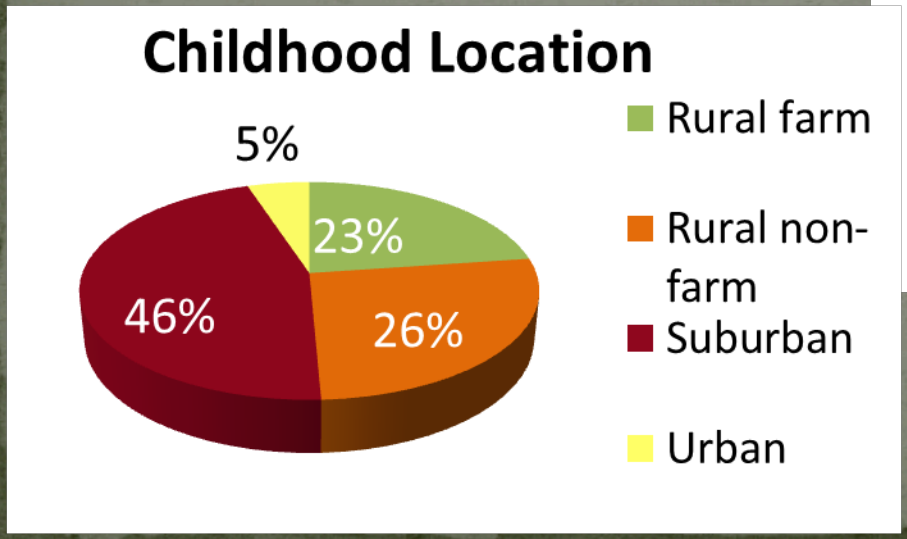




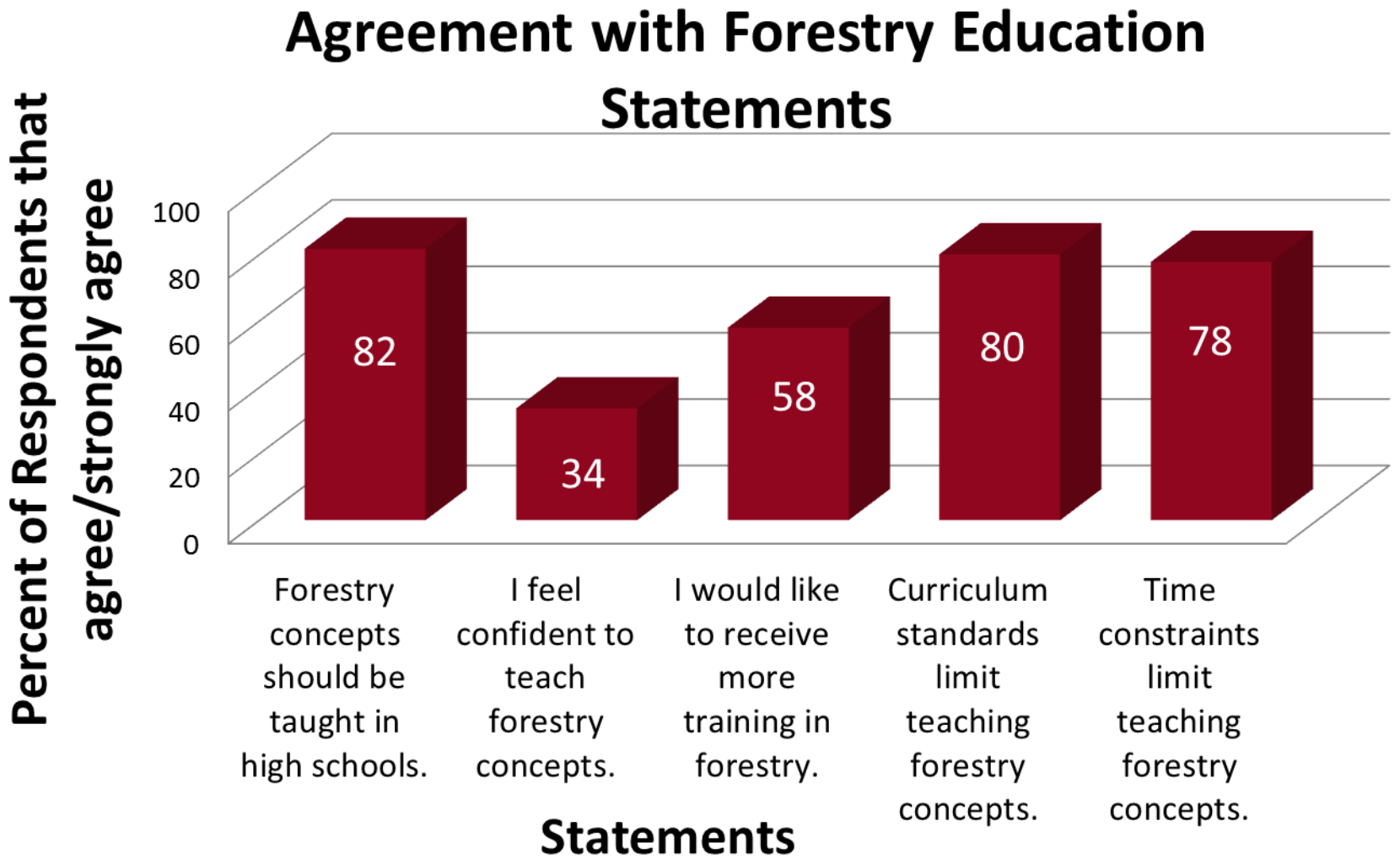
What are Their Connections to Forestry?







Attitudes toward Forestry Education



Impacts of Forest Management

Most beneficial to:

- Wildlife habitat
- Forest health
- Air quality
- Water quality
- Biodiversity

Least beneficial to:

- Property value
- Climate change prevention
- Carbon storage
- Human well-being
- Outdoor recreation

Forest Management Goals

Most important for teachers:

- Water quality
- Air quality
- Biodiversity
- Wildlife habitat
- Endangered species

Most important for managers as perceived by teachers:

- Timber
- Fire prevention
- Wildlife habitat
- Water quality
- Air quality

Familiarity with Management Practices

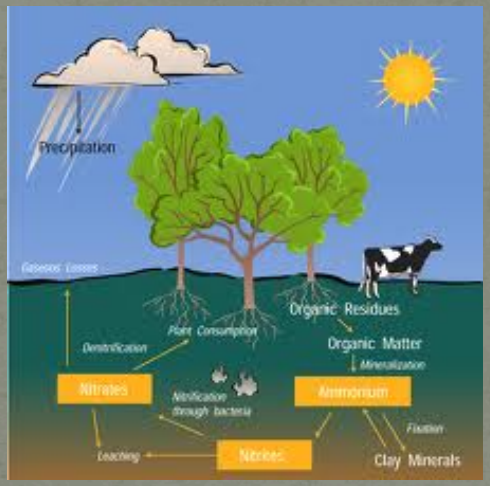
Practices not recognized by a large portion of respondents:

- Growing non-timber forest products (29.3%)
- Slash burning (25.2%)
- Planting on streamside zones (25.2%)
- Reforestation with tree clones (23.7%)
- Habitat improvement cuts (16.9%)
- Pine plantations (16.3%)

What Are They Teaching?

Most Frequently Taught:

- Air quality
- Wildlife habitat
- Biodiversity
- Nutrient cycling
- Climate Change



Least Frequently Taught:

- Tree measurement
- Wood products
- Forestry career opportunities
- Non-timber forest products
- Timber harvesting

How Often Are They Teaching It?

- **Concepts related to products, uses, and management of forests**
  - Mean = 1.55*
- **Concepts related to ecosystem services**
  - Mean = 2.38*
- **Concepts related to biological and physical characteristics of trees**
  - Mean = 1.68*

*Scale: 1 = never, 2 = sometimes, 3 = often

All means significantly different ($p < 0.000$)

Regression Model Predicting Frequency of Teaching Ecosystem Services Concepts

Parameter	Beta	Sig.
Importance of wildlife management goals	.337	.000
Teaching Biology	.309	.000
Teaching Environmental Science	.264	.000
Importance of products and uses management goals	-.169	.004
Environmental education training	.130	.010
Forestry large part of economy	.129	.012
Importance of ecosystem services management goals	.121	.026
Impacts of management beneficial to forests	.111	.028
Number of forest management practices recognized	.102	.043
Teaching Physical Science	-.090	.067
Confident to teach forestry concepts	.096	.079
R^2 = .565		

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Teaching Environmental Science	.211	.000
Teaching Agriculture Science	.236	.000
Informed of forestry	.188	.002
Impacts of management beneficial to humans	.132	.016
Number of management practices recognized	.136	.017
Curriculum standards limit teaching	-.118	.038
Spent majority of childhood in rural farm location	.092	.095
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Confident to teach forestry concepts	.204	.001
Teaching Agriculture Science	.212	.007
Involvement in school natural resources activities	.182	.009
Age	.137	.025
Teaching Horticulture	.133	.077
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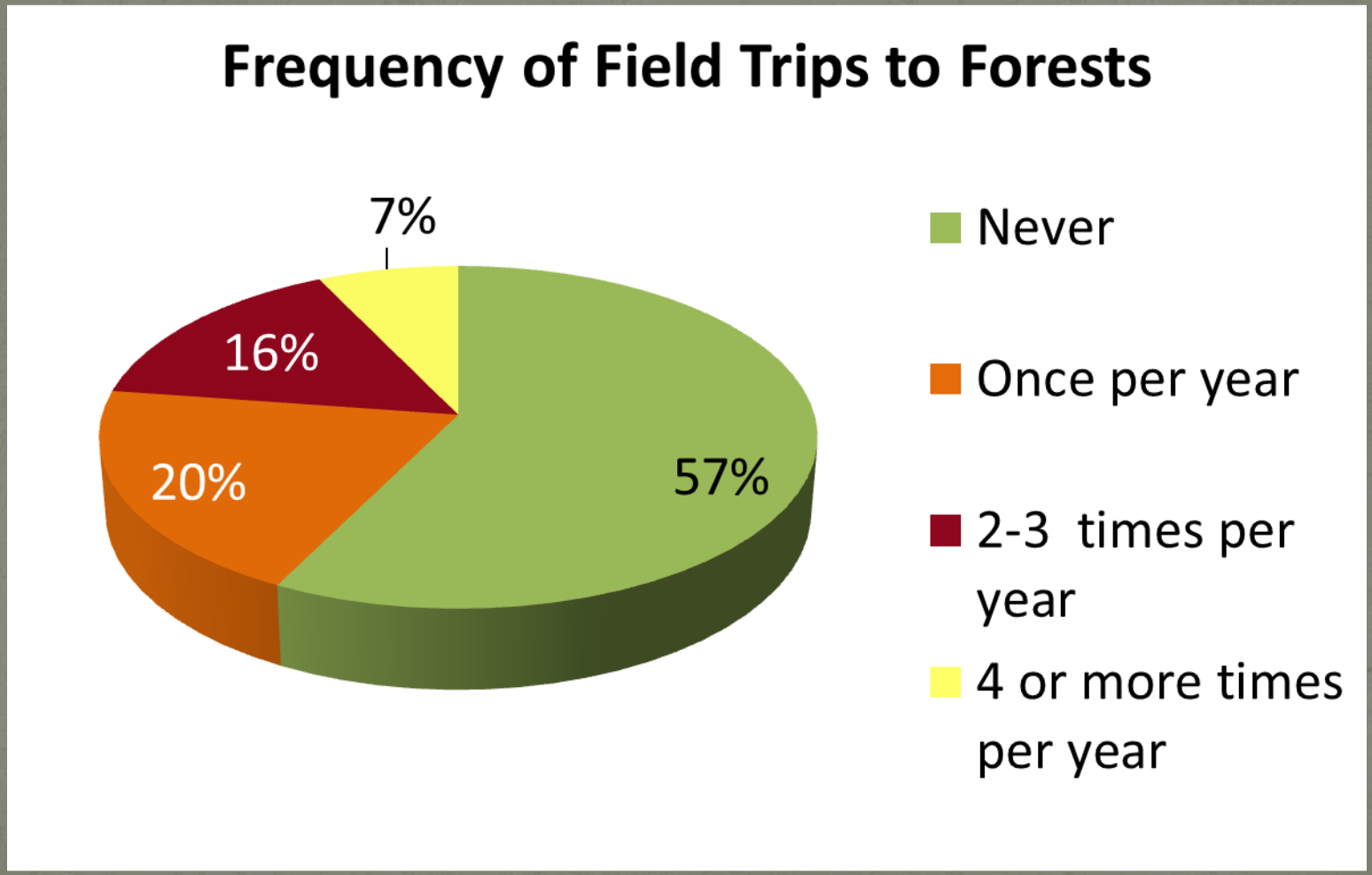
How often do they take field trips to forests?



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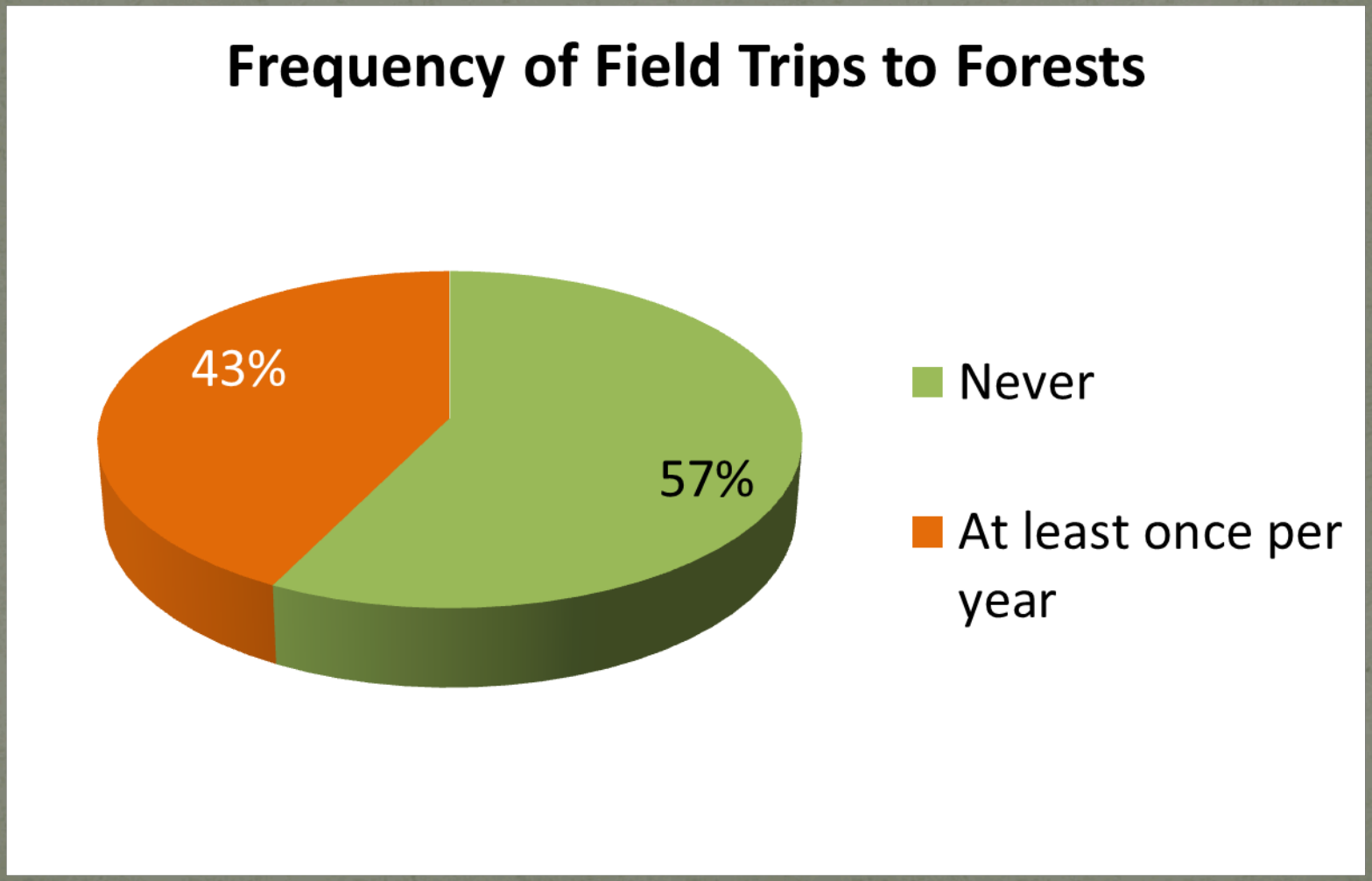
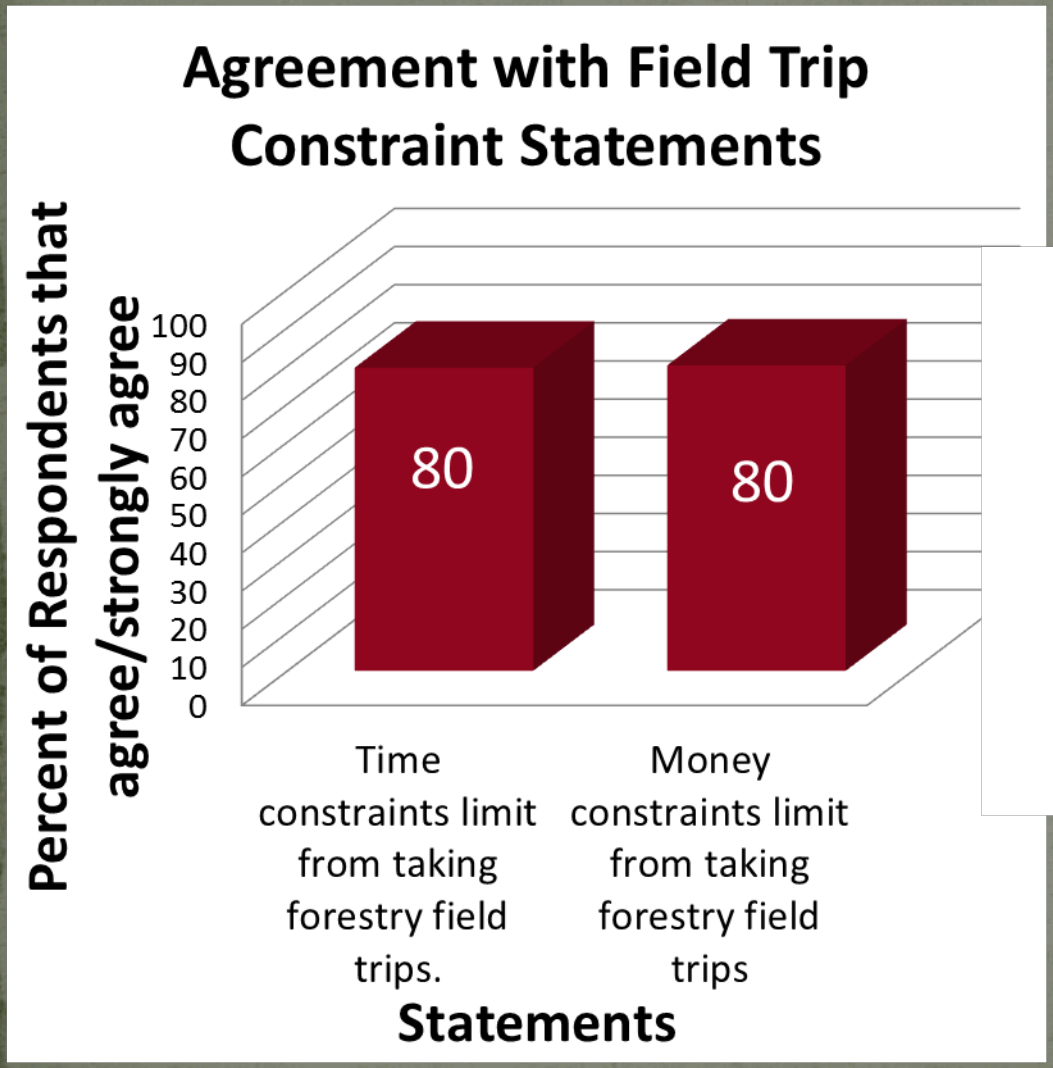
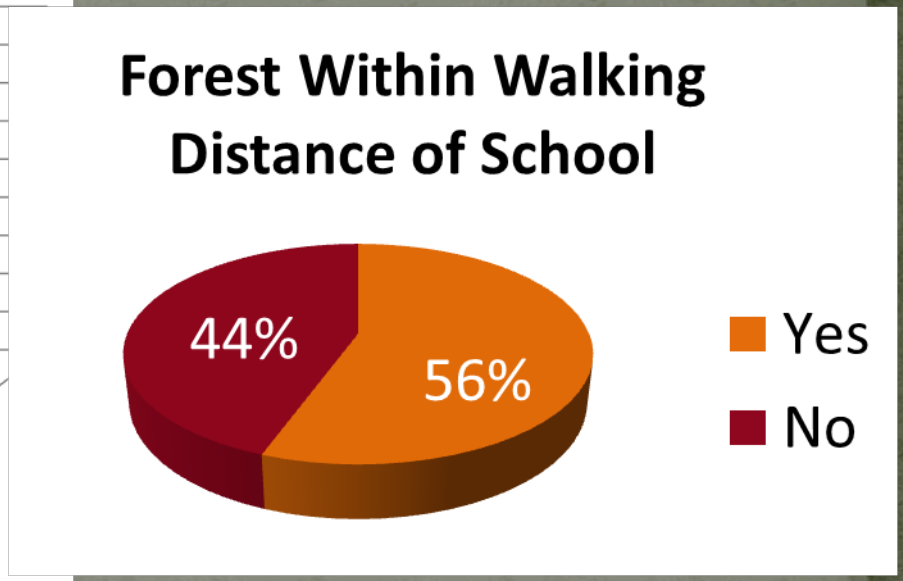


What are the Constraints?





Logistic Regression Model Predicting Whether Teachers Take Field Trips to Forests

Variables in Model	Odds Ratio	Sig.
Forest within walking distance	11.413	.000
Confident to teach forestry concepts	2.218	.000
Involvement in school natural resources activities	1.551	.004
Nagelkerke R Square = .477		

Conclusions

- Objectives 1 and 2: To determine the extent to which high school science teachers in the Southern Piedmont region are teaching forestry concepts and the variables that predict teaching frequency.

Conclusions

- High school science teachers in the Southern Piedmont region are teaching forestry concepts related to ecosystem services most frequently, followed by those related to characteristics of trees and finally those related to products, uses, and management of forests.

- A variety of variables work together to predict the frequency that each of these concept groups are taught most notably including knowledge and attitudes related to forestry.

Conclusions

- Objectives 3 and 4: To determine the frequency that high school science teachers in the Southern Piedmont region take field trips to forests for educational purposes and the teaching variables that predict whether or not they take field trips to forests.

Conclusions

- Over half (57%) of high school science teachers in the Southern Piedmont region never take field trips to forests. Just over a third (36%) do so one to three times per year and only a very small percentage (7%) take field trips to forests four or more times per year.

- Whether or not teachers take field trips to forests is extremely influenced by whether or not there is a forest within walking distance of their school. Other predictors include knowledge of forest management practices, involvement in school natural resources organizations, and level of confidence to teach forestry concepts.

Thank you!

Questions?