Project Learning Tree Secondary Module: Southern Forests and Climate Change

AIM 5: Annie Oxarart, Martha Monroe, Stephanie Hall, Jie Li, and Al Stenstrup
School of Forest Resources and Conservation, University of Florida

PINEMAP is partnering with Project Learning Tree, an award-winning national environmental education program, to develop a secondary module on climate change impacts on southern forest ecosystems, forest impacts on climate, and ways people can affect these relationships.

Overview

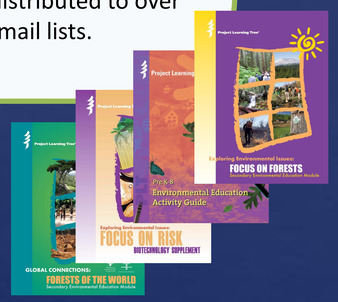
As part PINEMAP's education and knowledge transfer objectives, a supplemental secondary module is being developed for use in life science, environmental science, and agriculture courses in grades 9-12, with potential use in middle school or community college courses. Most climate education is delivered through an earth science course and does not address impacts to forest ecosystems.

The module will include approximately ten engaging activities, with each activity including concepts or research related to PINEMAP. By completing the activities in this module, students will be able to meet the following objectives:

- Gain an appreciation for the role of forests in models of climate change.
- Increase understanding of climate and change, carbon cycle, and carbon sequestration.
- Increase understanding of how forest management can remove carbon dioxide from the atmosphere and improve resilience of southern pine forests.
- Explore the role of consumer choices in climate change mitigation through life cycle analysis and product comparisons.

Needs Assessment

We recently launched an online survey for middle and high school science educators in the Southeast. The results of the survey will guide module development by identifying important content, strategies, challenges, and opportunities for integrating climate change topics into life science classrooms. The survey has been distributed to over 3,500 educators through several email lists.



Adventures in LCA
Students perform an LCA play comparing aluminum, plastic, and pine lawn furniture.

Carbon on the Move
Students trace a carbon molecule through the biological portion of a carbon cycle and discuss strategies for removing carbon from the atmosphere.

LCA Debate
Students debate the environmental costs and benefits of common products they consume.

Framework

The module is divided into four sections, each conveying a central theme with background information and suggestions for subject integration and activity use.


Climate Change and Forests

Activities will contain teacher background information and instruction; student readings, handouts, or worksheets; media and technology connections; supplemental extensions; assessment ideas; and additional resources. Activities will be supplemented with slide presentations, videos, web links, and an online teacher workshop.

Section 1: Projected climate changes will likely affect forest ecosystems.
- Multiple Perspectives on Climate Change
- Four Impacts on Southern Forests
- It's a System: The Power of Feedback Loops

Section 2: Forests can be managed to thrive in a changing climate.
- Who Owns the Forest?
- Forest Management Strategies to Beat the Odds

Section 3: Forests can be managed to reduce atmospheric greenhouse gas and to prevent greenhouse gas emissions.
- Carbon on the Move
- Counting the Carbon

Section 4: Consumer choices can play a role in reducing and preventing carbon emissions.
- The Real Cost: Shopping for Externalities
- Adventures in Life Cycle Assessment
- Life Cycle Assessment Debate
- Optional: Tutorial to Develop a Life Cycle Assessment

Putting It All Together: Climate, Forests, and Communities

Advisory Committee

The PLT-PINEMAP Education Advisory Committee is helping to ensure the development of high-quality, relevant, and useful materials. The 26-member committee meets bimonthly via conference call and includes PLT state coordinators, science teachers, university faculty, and members of the national Climate Literacy Network.

Timeline

2012 Finish needs assessment; Develop module, online training, and formative evaluation
2013 Develop pilot test (spring); Conduct pilot training (summer); Conduct formative evaluation (fall)
2014 Revisions, production; Summative evaluation development
2015 Release program; Evaluation; State support through in-person workshops and online training

Integration

This project provides the perfect opportunity for aim integration, as it includes topics and research from most aims. **You can be involved by reviewing activities and helping us develop activities ideas based on your research.**

Counting the Carbon
After measuring the carbon in one tree, students calculate the carbon in a forest and cornfield, and then estimate the acres needed to sequester their carbon emissions for a year.