Climate Change and Southeastern Forests: A Project Learning Tree Secondary Module

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Overview

In partnership with Project Learning Tree, a widely-recognized environmental education program, PINEMAP's Education Aim has created a set of hands-on activities to help educators teach about climate change and southern pine forests. This secondary module is designed for use in life science, environmental science, and agriculture courses in grades 9-12, with potential use in middle school or community college.

This supplemental teaching resource contains 13 engaging activities that echo every dimension of PINEMAP's research. Activities contain teacher background information and instructions; student readings, handouts, or worksheets; supplemental extensions; assessment ideas; and additional resources. Activities will be supplemented with slide presentations, videos, and a website with online training resources.

Module Development

To guide the development of this module, our team conducted an audience assessment with secondary science teachers in the Southeast and consulted with experts regarding activity ideas and content. In addition, we met bimonthly with an Education Advisory Committee to discuss and critique draft activities. Twenty-four educators served on the committee, representing climate, forestry, education, curriculum development, and training expertise. In February 2013, the activities were sent to PINEMAP collaborators and external experts for content review. We received 25 reviews and are in the process of incorporating feedback into the final draft.

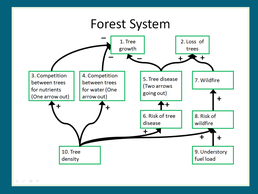
More than 80 people have been connected to the development of these materials, enhancing the linkages between educators and forest/climate researchers.

The module contains 13 activities to help students understand climate change, the carbon cycle, forest health, forest management strategies, and how consumers can make a difference through purchasing choices.

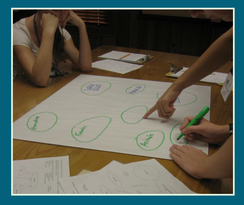
Example Activities

Atlas of Change
Using the USFS Tree and Bird Atlas, students learn about modeling and potential changes in suitable forest habitats.

Managing for Change
Students diagram connections between forests, climate change impacts, and management strategies for creating resilient forests.



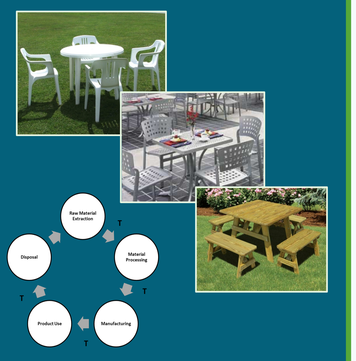
Carbon on the Move
Students trace a carbon molecule through the biological portion of a carbon cycle and then map the full carbon cycle.



Mapping Seed Sources
Students graph growth data from loblolly pine forests to identify genetically different populations and project where trees with certain characteristics are likely to thrive in changing climatic conditions.

Counting the Carbon
After measuring the carbon in one tree, students calculate the carbon in a forest and other land uses, and then estimate the acres needed to sequester their state's carbon emissions for a year.

Adventures in LCA
Students perform a play to explore life cycle assessment data for aluminum, plastic, and pine lawn furniture and compare greenhouse gas emissions of each.



Formative Evaluation

In fall 2013, we will conduct a formative evaluation of the module with secondary educators. During this pilot test, approximately 40 teachers from around the Southeast will use at least two module activities with their students and provide feedback on how the activities work in the classroom and how they can be improved.

Module Activities

The activities focus on increasing student knowledge, building systems-thinking and decision-making skills, and instilling confidence that individual and community actions can help address climate change. The activities are organized by themes into five sections.

Section 1: Climate Change and Forests

Projected climate changes will likely affect forest ecosystems.

1. The Changing Forests
2. Clearing the Air
3. Atlas of Change

Section 2: Forest Management and Adaptation

Forests can be managed to thrive in a changing climate.

4. Managing for Change
5. Mapping Seed Sources

Section 3: Carbon Sequestration

Forests can be managed to reduce atmospheric greenhouse gases and to offset greenhouse gas emissions.

6. Carbon on the Move
7. Counting the Carbon

Section 4: Life Cycle Assessment

Consumer choices can play a role in reducing and preventing carbon emissions.

8. The Real Cost
9. Adventures in LCA
10. LCA Debate

Section 5: Solutions for Change

Working toward healthy, sustainable forests and communities

11. The Carbon Puzzle
12. Future of Our Forests
13. Starting an Environmental Action Project!

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