

## 2025 Envirothon

### Forestry Current Topic – Roots and Resiliency: Fostering Forest Stewardship in a Canopy of Change

The Roots and Resiliency: Fostering Forest Stewardship in a Canopy of Change section of the Kentucky Envirothon will focus on climate change's impact on forested ecosystems and how forests can be managed to maximize their benefits in a world altered by climate change. Students should have a basic understanding of climate change generally, how it is impacting plant communities, the benefits of trees and forests for humans and the environment, and the role of forest stewardship in enhancing these critical natural resources. The Envirothon test for this section will consist of both a written section and an oral component.

#### Learning Objectives

##### Key Topic 1: Climate and plant communities

- Describe 'climate' and its components; understand the relationship between climate and weather
- Be able to discuss the relationship between biotic and abiotic components of an ecosystem
- Describe 'microclimate' and how it differs from 'macroclimate'
  - Understand and be able to discuss the 'heat island effect'
- Understand the greenhouse effect and climate feedbacks
- Understand the carbon cycle
  - Carbon sequestration
- Understand tree species range maps
  - Be able to discuss how and why these ranges may change in the future
- Understand and be able to discuss the USDA Plant Hardiness Map
  - Be able to discuss why this map has recently shifted

##### Key Topic 2: Benefits of trees and forests

- Be able to discuss the benefits of trees and forests, including:
  - Environmental – water, air, wildlife, climate (including microclimate)
  - Human health
  - Economic
  - Social
- Be able to define and discuss 'ecosystem services'

##### Key Topic 3: Forest Health in a Changing Climate

- Be familiar with the invasive plants, pests, and pathogens facing Kentucky's forests (see UK's Forest Health page linked below)
  - Know how climate change impacts these forest health threats
- Explain how wildfire impacts forested ecosystems

## Key Topic 4: Forest Stewardship

- Be able to define and discuss 'Forest stewardship'
  - Understand and be able to discuss how our connection to tree/forests and our values affect how we engage with forest stewardship?
- Describe 'forest management'?
  - What social mechanisms are employed to help manage forest resources
    - Regulations, legislation, incentives, etc.
    - Kentucky Forest Conservation Act
    - Carbon markets / carbon credits
  - Describe and be able to discuss the differences between 'conservation' and 'preservation'
  - How and who make forest management decisions
    - Understand and be able to discuss the rolls of different forest management groups in Kentucky
      - Private landowners and public
      - Division of Forestry
      - USDA Forest Service

## Study Resources

### Key Topic 1:

[The Arbor Day Foundation – Fighting Climate Change](#)

[U.S. Dept. of Agriculture – 2023 USDA Plant Hardiness Zones Map](#)

[American Forests – What Drives Us – Climate Change](#)

[Basics of Climate Change - US Environmental Protection Agency, 2024 \(Envirothon Study Resources, Part A: pages 4-6\)](#)

[Virginia Tech – Dendrology Fact Sheets](#)

[U.S. Environmental Protection Agency – Heat Island Effect](#)

[USDA Forest Service – Climate Atlas](#)

[Michigan Technological University - Climate Change Impacts on Kentucky Forests](#)

[University of Kentucky – Forest Adaptation Concepts](#)

### Key Topic 2:

[The Nature Conservancy 6 Ways Trees Benefit All of Us](#)

[The Arbor Day Foundation – The Value of Trees](#)

[U.S. Dept. of Agriculture – Ecosystem Services](#)

**Key Topic 3:**

[Forest health in a changing world: effects of globalization and climate change on forest insect and pathogen impacts](#)

[University of Kentucky Forest Health page- see sections on insects, pathogens, and invasive plants](#)

[How Does Wildfire Impact Wildlife and Forests \(Envirothon Study Resources, Part A: p. 34\)](#)

**Key Topic 4:**

[Kentucky Division of Forestry – Kentucky Forest Conservation Act](#)

[Kentucky Division of Forestry – Forestry Publications](#)

[USDA Forest Service – Forest Stewardship Program](#)

[Kentucky Division of Forestry – Forest Stewardship Program](#)

[Sustainable Forestry Initiative](#)

[Forest Stewardship Council](#)

[The Nature Conservancy – Carbon Markets Explained](#)