

**Factors Affecting Natural Vegetation**  
(page 2)

**Factors Affecting Natural Vegetation**

**1) Temperature**

Plants are rarely affected by hot temperatures if sufficient supplies of water are available. Plants are most severely affected by cold temperatures.

Vegetation near the North and South Poles is almost non-existent except for shrubs, mosses, and lichens. Trees become dwarfed when the maximum summer temperature fails to go above 10 degrees Celsius. This 10 degree isotherm forms the **tree line**. Areas above this line are characterized by a short, cool growing seasons. Trees in this area are set far apart and become shorter nearer the poles.

**Summary: Effects of Temperature on Natural Vegetation**

- hot, wet climates usually produce the tallest, very tightly spaced trees (exception: deserts);
- warm climates usually produce tall, tightly spaced trees;
- cool climates usually produce tall, moderately spaced trees and grasses;
- cold climates usually produce short, loosely spaced trees;
- arctic climates usually produce dwarf, sparsely spaced trees or non-existent vegetation.

**2) Precipitation**

Plants that exist in water or very damp areas (such as bogs) normally has shallow roots, and large leaves. Plants that exist in dry areas has deep roots, small, and wax coated leaves. Plants that exist in wet-dry climates, with one season in which water is unavailable, drop their leaves and become dormant. When water is again available, they leaf out and grow at a rapid rate.

**Summary: Effects of Precipitation on Natural Vegetation**

- hot, wet climates have an abundance of precipitation and produce a leaf canopy that blocks 95% of sunlight from reaching the forest floor (without sunlight, plants on the forest floor grow slowly and do not compete for the same resources);
- warm + cool climates have adequate amounts of precipitation and produce a leaf canopy that prevents 75% of sunlight from reaching the forest floor;
- cold climates have inadequate amounts of precipitation and produce a leaf canopy that prevents 60% of sunlight from reaching the forest floor;
- arctic climates have very little precipitation and produce a leaf canopy that prevents 0 to 10% of sunlight from reaching the Earth.

**3) Soil**

To classify a soil as fertile or infertile, a vertical cut, or profile is made to observe the three horizontal layers. The three main horizontal layers are known as, topsoil, subsoil, and parent material. Topsoil is the layer containing humus - the decomposition of plant and animal matter. The subsoil is the layer of nutrient accumulation. The parent material layer may be the local bedrock, either solid or broken into smaller pieces. A fertile soil holds nutrients and moisture in the topsoil and subsoil.

**Summary: Effects of Soil on Natural Vegetation**

- hot, wet climates usually produce soils with a poor topsoil, the nutrients are carried below the subsoil by the large amounts of rainfall, very little humus;
- warm + cool temperatures usually produce soils with a good topsoil, most nutrients remain in the topsoil and subsoil, much humus;
- cold climates usually produce a poor topsoil, the cold temperatures slows the mechanical and chemical actions that mature a soil, little humus;
- arctic climates usually produce a poor topsoil, the arctic permafrost stops the mechanical and chemical actions that mature a soil, little or no humus.

**4) Competition**

The evolutionary process of natural selection has allowed certain plants to become the dominant vegetation. For example, if a mid-latitude, mixed forest lot is cleared and allowed to regenerate, the following stages of development will occur:

Stage 1 - grasses, small plants, and shrubs appear;

Stage 2 - the shade allows for tree seedlings to germinate and small trees appear;

Stage 3 - shrubs and trees begin to compete for light, moisture, and nutrients;

Stage 4 - shrubs adapt by growing taller and spindly - a fatal adaptation, shrubs soon die;

Stage 5 - trees succeed and become the dominant vegetation.

**Summary: Effects of Competition on Natural Vegetation**

- when two species are competing for the same resources in the same community, one species will be eliminated, the other will dominate;
- most species in a community tend to complement one another by using different aspects of a community's resources.



**Topic 2: Patterns in Physical Geography (Gr. 7)**  
**Unit IV: Natural Vegetation Patterns**

**Global Natural Vegetation in Review**  
**The Effects of Climate on Natural Vegetation (page 3)**

**DAY 1**

PHOTOCOPY THIS PAGE

COMPLETE THE CHART

- Category 1: Understanding of Concepts**
- 1  shows understanding of few of the concepts
  - 2  rarely gives complete explanations
  - 3  shows understanding of some of the concepts
  - 4  sometimes gives complete explanations
  - 5  usually gives complete or nearly complete explanations
  - 6  shows understanding of all (or almost all) of the concepts
  - 7  consistently gives complete explanations

Climate Zone: **Hot, wet**

Tree height: \_\_\_\_\_

Tree spacing: \_\_\_\_\_

Amount of precipitation: \_\_\_\_\_

Amount of sunlight able to pass through the leaf canopy and reach the forest floor: \_\_\_\_\_

Quality of topsoil: \_\_\_\_\_

Amount of humus: \_\_\_\_\_

Climate Zone: **Warm**

Tree height: \_\_\_\_\_

Tree spacing: \_\_\_\_\_

Amount of precipitation: \_\_\_\_\_

Amount of sunlight able to pass through the leaf canopy and reach the forest floor: \_\_\_\_\_

Quality of topsoil: \_\_\_\_\_

Amount of humus: \_\_\_\_\_

Climate Zone: **Cool**

Tree height: \_\_\_\_\_

Tree spacing: \_\_\_\_\_

Amount of precipitation: \_\_\_\_\_

Amount of sunlight able to pass through the leaf canopy and reach the forest floor: \_\_\_\_\_

Quality of topsoil: \_\_\_\_\_

Amount of humus: \_\_\_\_\_

Climate Zone: **Cold**

Tree height: \_\_\_\_\_

Tree spacing: \_\_\_\_\_

Amount of precipitation: \_\_\_\_\_

Amount of sunlight able to pass through the leaf canopy and reach the forest floor: \_\_\_\_\_

Quality of topsoil: \_\_\_\_\_

Amount of humus: \_\_\_\_\_

Climate Zone: **Arctic**

Tree height: \_\_\_\_\_

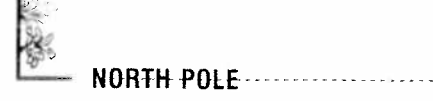
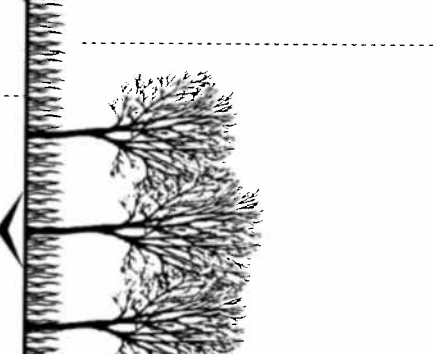
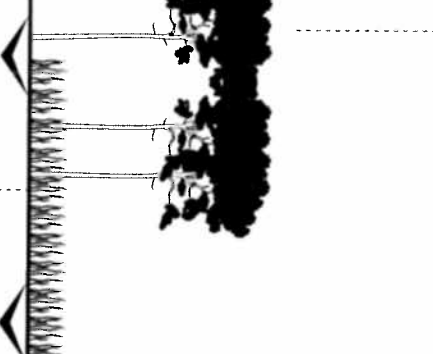
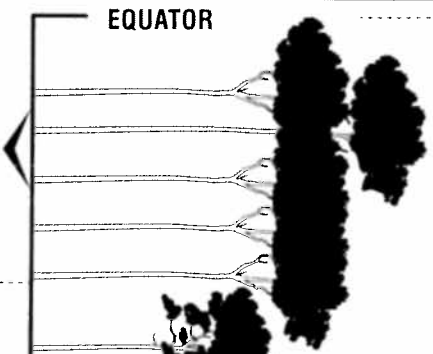
Tree spacing: \_\_\_\_\_

Amount of precipitation: \_\_\_\_\_

Amount of sunlight able to pass through the leaf canopy and reach the forest floor: \_\_\_\_\_

Quality of topsoil: \_\_\_\_\_

Amount of humus: \_\_\_\_\_



A) \_\_\_\_\_ B) \_\_\_\_\_ C) \_\_\_\_\_ D) \_\_\_\_\_ E) \_\_\_\_\_ F) \_\_\_\_\_ G) \_\_\_\_\_