

**BIOLOGY 2404a**  
**FLORA AND VEGETATION OF**  
**ONTARIO**  
<http://instruct.uwo.ca/biology/2404a>  
**Fall 2009**

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**TODAY'S OUTLINE**

- Course introduction and logistics
  - Announcements and Contacts
  - Grading, Lectures, Labs, Texts
- Introducing your lecturer
- What organisms are we going to study?
- Flora vs. vegetation
- Introduction to biomes and plant geography

**GRADING**

- Who am I? 2% (Tue Sep 20)
- Midterm Exam 15% (Tue Oct 20)
- Lab Assignments 22% (Weekly)
- Lab Test 15% (Mon Dec 7)
- Final Exam 30% 3h (TBA)
- Plant Collection 16%% (Mon Nov 9)

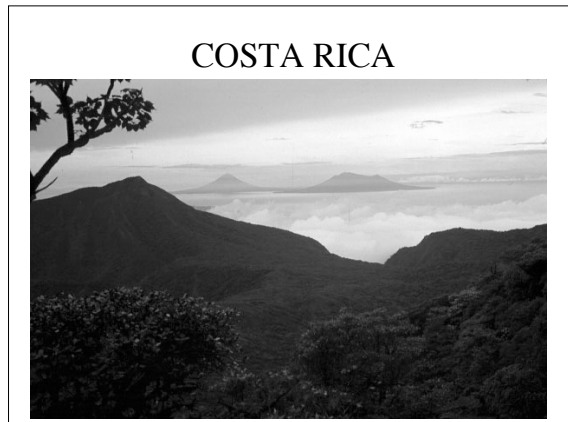
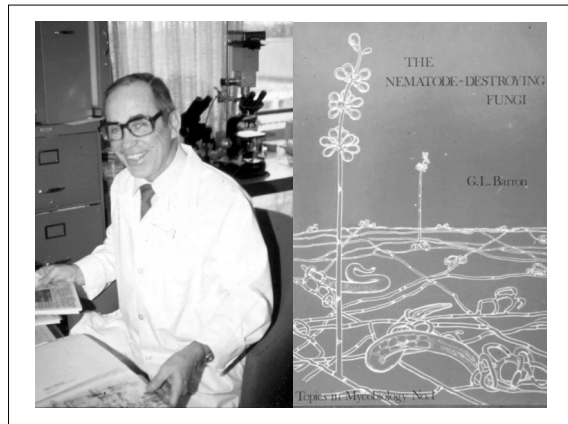
**Lectures, Labs & Texts**

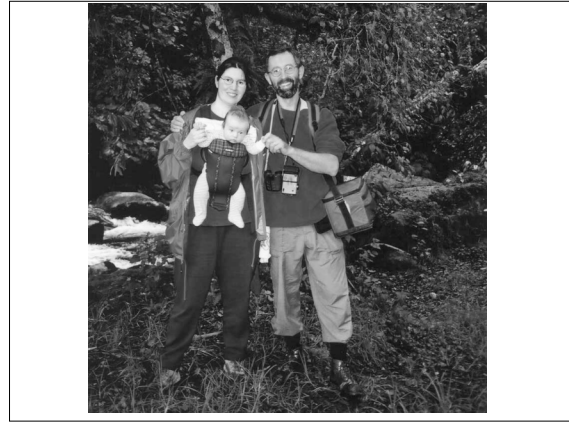
- Lectures emphasize concepts
- Labs emphasize plant morphology and recognition
- Two required texts: Trees of Ontario, Wildflowers of Ontario
- Lab Manual provided online

**Tentative Schedule (synopsis)**

- Systematics and ecology
- Midterm
- Human impacts and uses, conservation
- Final exam







### What organisms do we study?

- “Large” (visible without a hand lens), terrestrial, photosynthetic organisms traditionally called “plants”
- Lichens
- Bryophytes
- Pteridophytes
- Gymnosperms
- Flowering Plants
- Emphasis on the last group

### Objectives

Become familiar with:

- the major types of vegetation in Ontario (and why they are where they are),
- the woody plants (trees and shrubs) that dominate our landscape,
- some of the most important plant families of our area,
- conspicuous and important “alien” flora, and
- historic and future changes to the flora and vegetation of Ontario (and the World)

### Darwin (Voyage of the Beagle, 1836)

**“a traveller should be a botanist, for in all views plants form the chief embellishment.”**



### Some definitions

- Populations
- Species
- Communities
- Ecosystems
- Biomes
- Flora
- Vegetation

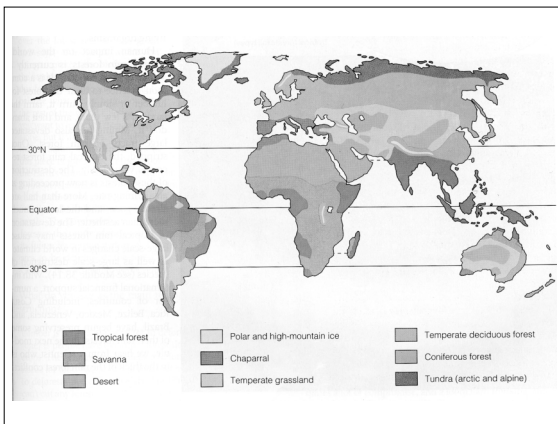
## Ecosystem

**An ecosystem is the sum of the biological community and its environment**



## Biomes

**Major terrestrial ecosystems are called biomes, and we describe biomes on the basis of their predominant vegetation. Another term used for biomes is Life Zones.**



## Flora versus Vegetation

- **Flora is the species diversity of plants living in an area**
- **Vegetation is described by the form and name of the dominant plants**
- **The flora of Ontario is approximately 2800 species**
- **London is in the deciduous forest region**

## Convergent Evolution

- **The vegetation of two widely separated areas of the same biome may be similar, even though the floras are very different. Organisms, including plants, may appear similar by convergent evolution on a successful design (adaptation) for similar circumstances.**

## Abiotic factors affecting distribution of organisms

- **Energy**
- **Water**
- **Temperature**
- **Soil and parent materials**
- **Nutrients**
- **Disturbance**
- **Wind**
- **Latitude and altitude**

## **Energy**

- **All ecosystems need a source of energy: light or chemical**
- **Availability of light greatly influences the distribution and productivity of organisms**

## **Water**

- **All organisms need water**
- **Availability of water - both quantity and timing - also greatly influences the distribution of organisms**

## **Temperature**

- **Most organisms are active within a narrow range of temperatures**
- **Temperature also influences the availability and need for water**

## **Soil and parent materials**

- **Soil is formed by the weathering of rocks - called parent materials - and the decomposition of organic matter.**
- **Different parent materials influence the development of soils and the distribution of vegetation**
- **Different vegetation also affects the formation of soil**

## **Nutrients**

- **Nutrients are any chemical substances required for growth and reproduction**
- **Oxygen is plentiful in the modern atmosphere (18%), but may be scarce in water and soil**
- **Key soil nutrients such as phosphorus (P) or magnesium (Mg) may be leached by rains, and then limit plant growth**

## **Disturbance**

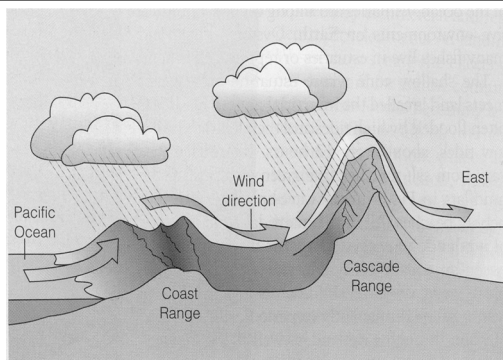
- **Disturbance is any event or biological action that removes biomass**
- **Fires, hurricanes, volcanic eruptions and grazing cause disturbance**
- **Disturbance may cause or prevent the succession of communities of organisms**

## Wind

- In addition to acting as a cause of disturbance, wind may bring nutrients and take away water and heat

## Latitude and Altitude

- Latitude (degrees north or south of the equator) and altitude (height above sea level) both affect temperature
- Altitude also affects precipitation



F. How mountains affect rainfall (Washington state)  
Source: Campbell, Mitchell and Reese, 2000. Biology: concepts and connections.

## Water and Temperature dominate

Of the nine abiotic factors listed, water (precipitation) and temperature dominate the distribution of organisms, and can be used to predict the major type of vegetation that will be present

## Vegetation Varies Within Biomes

Within biomes, the actual vegetation depends on local geography, microclimate, soils and disturbance.

Laramie (WY) is in the grassland biome, but streamside vegetation is dominated by cottonwoods and willows, and the Laramie Range by spruce, pines and fir.



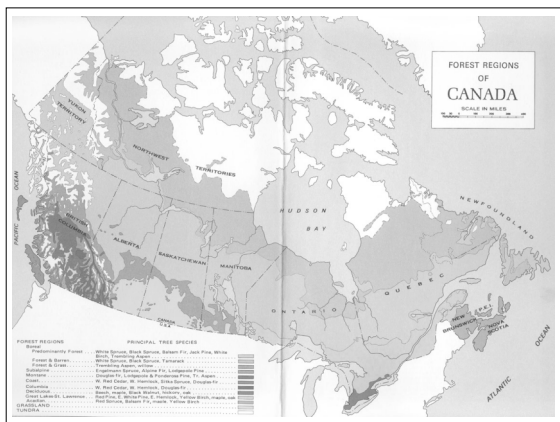
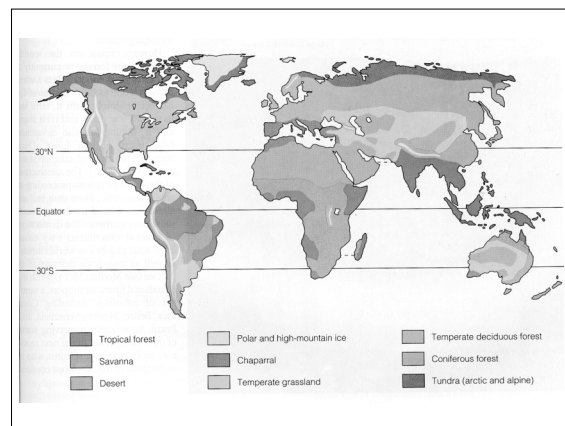
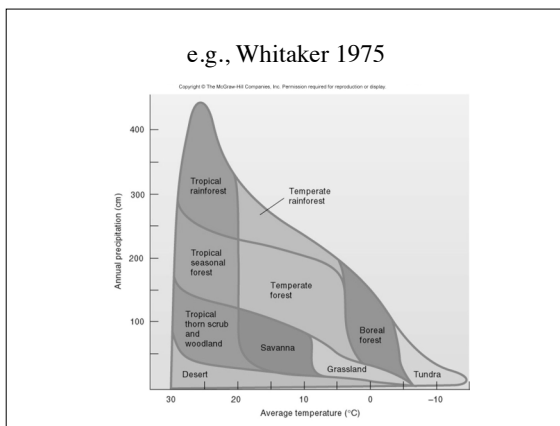
## Climate and Weather

- Climate is the long-term average of weather - described by mean monthly and mean annual values for temperature (minimum, maximum, average) and precipitation
- Weather consists of short-term events - what you see when you look outside

The relationship between climate and vegetation has been recognized for a long time

- Willdenow (1798) **Principles of Botany**: Vegetation types are based on climate
- von Humboldt (1805) **Ideas on Geography of Plants**: Plant associations are related to climate
- Warming (1895) **Ecological Plant Geography**: Dominants, succession, and the relationships of fire, time, soils, and climate on vegetation

e.g., Whitaker 1975



Forest regions of Ontario, from Wake (1997)



Figure 6. Ontario's five forest (ecological) regions and three physiographic regions.

## Monday's Lab

- Meet in BGS 3015 at 2:30 - Be prepared to go on a walk in rain or shine
- Campus and herbarium tour
- There will be a computer exercise that you can complete on your own time
- Lab assignment due the following week (2%)