

Overview: Ecological succession is the gradual change in a biotic community over time in following disturbance or altered substrate. Succession involves *dynamic relationships* between organisms and environment leading to changes in resource availability which favor some species over others. Our goal will be to apply concepts of environmental physiology in an effort to explain plant species abundance spatially and temporally.

Approach: Text: Molles, Chapter 20, pages 455-465. Read the introduction (pp. 455-456) and reflect on Concepts 20.1 and 20.2. Then, in pages give particular attention to the text figures listed below (Table 1), and use the reading to complete the following table:

Table 1. Trends in Primary and Secondary Succession – \* Indicate Increases ↑ or Decreases ↓

Parameter and Biotic Community	Text Figure	*Trend	Explanation
Species Richness, Glacial Substrate	Figure 20-2		
Woody Plants: I° and II° Succession	Fig. 20-3, -4		
Bird Species, Forest Succession	Figure 20-5		
Sp. Richness, Intertidal Boulders	Figure 20-7		
Aquatic Macroinvert. Sp. Diversity	Figure 20-9		
Depth of O-Horizon; Organic Litter	Figure 20-10		
Soil Moisture and Soil Nitrogen	Figure 20-11		
Ca <sup>2+</sup> , K <sup>+</sup> , NO <sub>3</sub> <sup>-</sup> loss (export) 2 years after “Clearcut”	Figure 20-15		
Ca <sup>2+</sup> , K <sup>+</sup> , NO <sub>3</sub> <sup>-</sup> loss (export) 10 years after “Clearcut”	Figure 20-15		
Biomass Accumulation/Area	Fig 20-16, 17		
Gross Primary Production	Figure 20-18		

Questions to Consider:

- Which of the following species would you choose as a biofuel source if you had 5 acres of land in which to grow it– algae (microphyte such as *Spirogyra*), switchgrass, or fast-growing Poplar trees  
Hint: Consider the proportion of total living mass in each species that is non-photosynthetic.
- From Figure 20-18 and your answer in #1, is allowing forest succession to occur toward a mature, old growth forest a good strategy for sequestering carbon dioxide? Producing lumber?
- Skim-read Molles, pages 276-280 (Ch. 12) and come prepared to discuss the following questions: >
  - What reproductive strategy would favor *pioneer* plant species that are good at invading bare soil?
  - What strategy would favor competition within a mature forest with complex stratification?