Comments on Chapter 23
Sections 1-2, 5, & 7-9

Do NOT worry about Sections 3, 4, 6, and the Ecological Issues & Applications on pages 533-536.

Pay close attention to the information in the introduction to the chapter that is found on pages 511-512.

In particular:

Study the climograph shown in Figure 23.2. It is more complex than the one given in lecture and the axes are reversed. But it is a useful reference when learning the general patterns described on page 512.

You can ignore Figure 23.1.

Know the general pattern described for how the range of values for mean annual precipitation changes as the mean annual temperature decreases.

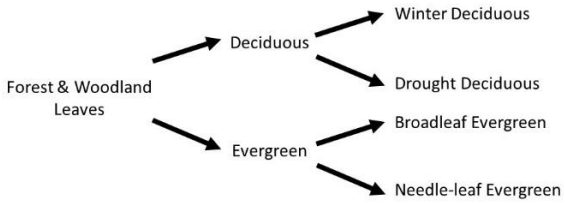
Know the geographic patterns – as one goes from the equator to the poles – for the variability in precipitation (the same pattern you just learned from the previous bullet), the average annual amount of precipitation (see Fig. 2.17), the variability in temperature (see Fig. 2.8), the variability in day length (# of hours of light), and the length of the growing season.

Section 1:

This section contains important information that you are expected to know but that was NOT presented in class. So study the information in this section carefully with the following guidance:

Note the differences in carbon allocation patterns for grasses, shrubs and trees. And the advantages and disadvantages of these patterns in different environmental conditions.

Know the various categories of forest leaf types and the conditions and biomes where they are found. The following diagram might be a useful start:



The economic model described at the bottom of page 512 may be helpful but you don't need to know it.

Know how plant life-forms change along geographic gradients of precipitation and temperature (see page 513 7 Figures 23.3 & 23.4).

The sections in the rest of the chapter discuss the major biomes individually but they are presented in a different order than the one used in lectures. So you can study them in the order given in lecture or the order in the textbook. In either case the guidance provided for each section should be helpful.

Section 2 (Tropical Rain Forests & Dry Tropical Forests):

Know the latitudes where tropical rain forests are found.

Know that the environment in rain forests is relatively constant with respect to temperature, hours of daylight, and has high humidity and abundant rainfall throughout the year. You don't need to know the exact values given in the textbook for temperature and rainfall. You do need to know, from lecture, that annual rainfall in a rain forest is > 250 cm.

You can skip the information contained in the Quantifying Ecology section on page 515.

Know that tropical rain forests have a very high diversity of plants and animals. The only statistic concerning diversity that you need to know about tropical rain forests from the textbook is that **this biome contains more than 50% of all known plant and animal species**.

You can skip the information on primates found on page 516, and only need to know the information presented in lecture about the vertical structure, productivity, rates of decomposition, and various terms (lianas, epiphytes, buttresses, etc.). The information about the dominant soils (oxisols) is covered in chapter 4 and in your lecture handouts.

The last two paragraphs in this section describe dry tropical forests which we subdivided into tropical thorn and tropical deciduous forests in lecture. Note the role that the distance from the equator plays, and why it is significant.

Section 5 (Deserts):

Know the reasons why deserts are located near 30^{o} latitude, in the rain shadow of mountains, and far inland on large continents.

Skip the detailed information about individual desert regions (starting with the 2nd full paragraph on page 522 ("Most of the arid …") and continuing through the 1st full paragraph on page 523 ("The deserts of southern Africa …").

Know the difference between hot and cold deserts based on what was given in lecture.

Don't worry about the species of plants and animals or the specific examples hot and cold deserts unless they were mentioned in lecture.

Note, and read about, only the examples and terms in the text that were also given in lecture (*Prosopis*, estivation, spadefoot toad, creosote bush, aridisol, islands of fertility, etc.).

Section 7 (Temperate Deciduous Forest):

Know the general information presented but skip over the specific details on the various types of deciduous forests, their locations, and the species they contain (2nd column page 526 & 1st paragraph on page 527).

You can ignore Figure 23.28.

Know the 4 vertical layers of vegetation. Note that the ground layer of herbs = the herbaceous layer mentioned in lecture.

Know why the plants in the herb layer bloom in the spring (Figure 23.29 b may help).

Note, that similar to other biomes, the availability of nutrients is related to rates of decomposition.

Section 8 (Boreal Forests AKA Taiga):

Skip the various specific locations and species mentioned on page 529.

Know that the boreal forest is also call taiga.

Know that boreal forest is dominated by needle-leaf evergreen trees at high latitudes in the Northern Hemisphere and at high elevations in lower latitudes.

Skip the information about the 3 major vegetation zones and Figure 23.32.

Know only the general information about the climate, the great depth of permafrost (relative to the tundra where it is closer to the surface), the role of fires, productivity, soil nutrients, soils, decomposition rates, and human disturbance.

The only specific animals to know are those mentioned in lecture (e.g. caribou, lynx, crossbills, etc.)

Section 9 (Arctic & Alpine tundra):

Don't worry about any information concerning polar desert.

Note the interacting forces that strongly influence the arctic tundra.

Don't concern yourself with solifluction and cryoplanation.

Know the general features of the vegetation (low # of species, slow growing, low growing, etc.)

Know the importance of belowground (root) growth relative to aboveground (shoot) growth.

Know that the diversity of animal life is low and know the characteristic species mentioned in lecture.

Know where alpine tundra is found and why the soils are drier despite receiving more precipitation.

You can skip the information on pages 533-536.

After studying the assigned sections in this chapter you should be able to answer the following study questions at the end of the chapter (pages 527-538): 1-4, 8, 11-12, and 15-18.