Comments on Chapter 4 Sections 3-5, 7, & 10

Do NOT worry about Sections 1, 2, 6, 8, 9, and the Ecological Issues & Applications on pages 64-65.

Almost all of this material was <u>NOT</u> covered in lecture.

So you are expected to learn it by reading the material in the textbook in conjunction with the following guidance.

Section 3:

Soil is hard to define but be aware that it is not just an abiotic environment. It includes numerous living things that play important roles.

Skip over the term regolith.

Section 4:

Be able to distinguish between mechanical and chemical weathering. In addition to material in this section, know the definition of these terms found in the Glossary (pages G-2 and G-9).

Be familiar with some of the processes responsible for each.

For example, water, wind, temperature change, and growing root can cause mechanical weathering – the physical breakdown of rock without its chemical alteration.

Section 5:

Be able to name the 5 soil forming factors and their influence on soil formation.

Section 7:

Know the main horizons (horizontal layers) that comprise a generalized soil profile (the O, A, B, & C horizons). And the characteristics of each.

Do NOT worry about the various subdivisions of the O horizon (Oi, Oe, & Oa) or the E horizon that is found in some soils.

Know that the A horizon is a zone of eluviation – a zone from which materials are washed out of.

Know that the B horizon is a zone of illuviation – a zone in which materials washed out of the A horizon are deposited into. So it is a zone of accumulation.

Carefully study the diagram and notes in Figure 4.9.

Section 10:

Know the 8 soil orders noted in class and the biomes they are often (though not exclusively) found in. These are: Gelisols (tundra); Spodosols (boreal forest); Alfisols, Inceptisols, & Ultisols (temperate deciduous forest); Oxisols (tropical rain forests); and Aridisols (deserts).

Know the five main soil-forming processes and the soil orders they are commonly associated with. These are: Laterization (Ultisols & Oxisols); Calcification & Salinization (Aridisols); Podzolization (Spodosols); and Gleization (Gellisol).

Note that laterization helps form Oxisols in addition to Ultisols, and that calcification often occurs in Aridisols in addition to salinization. These points are not mentioned in the textbook.

Carefully study the information in Figure 4.12 for the soil orders you need to know (see above).

Note there is a mistake in the text on page 64. Caliche is shown in the bottom photo of Figure 4.14 (not the top photo), and salinization is shown in the top photo of Figure 4.14 (not the bottom photo).

You can skip over Figure 4.13.

Carefully study Figure 4.14 and the information contained in the figure legend. Especially note that calcification results in an accumulation of calcium carbonate (caliche) in the B horizon of desert soils.

After studying this chapter you should be able to answer study questions 4, 5, 7, 10, & 11 on page 68 at the end of the chapter.