

Talking Points for Classroom Discussion

1. The instructor should check to see that students understand what they observed in the landscapes photographs. At the beginning of the classroom discussion (after the groups have presented their findings) ask the following reflection questions (or similar assessment questions):

- Why is it important to begin by observing physiographic features without interpreting them?
- How do agricultural and non-agricultural landscapes differ? How are they similar?
- Are there characteristics of land under cultivation about which we should be concerned?
- Why is it important for us to look at the impact of agriculture on the land?

2. During the classroom discussion the instructor should confirm that students understand the following terms:

- Erosion – the physical wearing away of the earth’s surface; surface soil material is removed in the process.
- (Surface water) runoff – water from precipitation that is not absorbed into the ground and instead flows along the surface
- Organic matter – material from anything that once lived, including plants, animals, and microbes. An important component of soil, it provides nutrients as well as other important things (such as microbes, soil stability, and air pockets) to support plant life.
- Anthropogenic – caused by humans
- Infiltration – the process of water entering the soil
- Ecosystem – a community of living organisms (plants, animals, and microbes) and their non-living physical environment)

3. In addition, it is important for students to understand why we care so much about soil erosion. The referenced USDA Soil Quality Information Sheet on erosion describes these concerns:

- Erosion removes topsoil, reduces levels of soil organic matter, and contributes to the breakdown of soil structure. This creates a less favorable environment for plant growth. (Project Slide 11 in Landscapes PowerPoint™)
- In soils that have restrictions to root growth (e.g. heavy clay soils with few organics), erosion decreases rooting depth, which decreases the amount of water, air, and nutrients available to plants. (Slide 12)

In summary: Without favorable environments for plant growth, how will we grow food?

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4. Lastly, a discussion of the interaction of the three earth systems discussed in this unit (Slide 13) – the geosphere (physical earth), the biosphere (where life is), and the atmosphere (weather and climate), as well as the hydrosphere (where water in any form exists) will help students to synthesize what they have learned. This discussion should include the following points:

- Sustainable versus unsustainable agriculture – For thousands of years before agriculture became industrialized, humans farmed sustainably. Industrialized agriculture is the practice of producing large amounts of food through the use of large machinery, large-scale application of chemical fertilizers and pesticides, and monocropping (planting only one crop in an area). Monocropping provides a much less diverse ecosystem that will support less plant and animal life. This type of agriculture has led to increased soil erosion rates (due to soil compaction and lack of cover crops among other things), runoff of harmful pesticides and nutrients into aquatic systems (Slide 14), and increased fossil fuel use not only to operate the machinery but from which to manufacture the fertilizers and pesticides. Subsistence farming – farming to feed yourself and your family – in soil that is readily vulnerable to erosion also has an impact, but at a smaller scale. See Unit 2 for examples of sustainable soil management practices.
- We also saw in this unit how agricultural landscapes differ from non-agricultural ones (Slides 8 and 9). Agricultural landscapes are often (but not always!) flatter than natural landscapes, they tend towards monocropping, and they have been so altered that most traces of their original natural landscapes features are gone. Natural landscapes often (but not always!) have more diverse ecosystems which are an important component of a healthy environment.
- If students made observations of the apparent climatic conditions of some of the landscapes, they will have noted such items as how much precipitation certain landscapes get (e.g. how dry the chaparral appears) or, in the case of some of the agricultural landscapes, it may be difficult for them to tell what the climate is. They may have also noted altitude, which can control what (if anything) is being farmed. Ask them to discuss what would happen to some of these agricultural landscapes (Slide 8) if the climate got wetter or drier or hotter or colder. Would these changes affect one of the landscape types more than another? If climate change causes more severe weather events such as more tornadoes or stronger hurricanes, how will agriculture be affected? How will soil and/or agriculture in your local area specifically be affected? How will humans grow food if these changes impact agricultural landscapes?