

**2011 North West Ohio Envirothon ~ Boy Scout Camp Lakota, Defiance
County, Ohio
Soils ~ Station**

- 1. Estuaries rely on regular impulses of nutrients from upland areas to maintain protective structures and power biological processes such as plant growth. What is the depth of topsoil in the soil pit?**
 - A. 2 inches
 - B. 5 inches
 - C. 10 inches
 - D. 16 inches

- 2. The structure of the soil directly affects the ability of water to either infiltrate soil or runoff downstream towards estuaries. What is the structure of the topsoil (A horizon)?**
 - A. Granular
 - B. Platy
 - C. Prismatic
 - D. Angular Blocky

- 3. What is the structure of the subsoil at a depth of 17” in the soil pit?**
 - A. Granular
 - B. Platy
 - C. Prismatic
 - D. Angular Blocky

- 4. The texture of the soil affects the ability of a soil to hold and release nutrients, metals, toxins and pathogens that can be carried down to an estuary. What is the texture of the topsoil in the soil pit?**
 - A. Loam
 - B. Clay
 - C. Sandy clay
 - D. Silty clay

- 5. The texture of the subsoil can affect the ability of a plant or other organism to anchor itself and stay in place when buffeted by high water currents or tides. What is the texture of the subsoil at 17” of depth in the soil pit?**
 - A. Loam
 - B. Clay
 - C. Sandy clay
 - D. Silty clay

- 6. Fresh water estuaries form where streams or rivers empty into lakes. Soils found along streams are often called Alluvial. Soils formed on lake beds are often called Lacustrine. What type of parent material did the soil in the soil pit form in?**
 - A. Alluvial Deposits
 - B. Aeolian Deposits
 - C. Glacial Till
 - D. Lacustrine Sediments

7. **There are many fine “rusty red spots” of an iron oxide in the soil from 0 inches to 5 inches in depth from the top of soil pit. What does this soil morphological feature imply?**
- A. The Seasonal High Water Table extends to the surface of the soil.
 - B. The Soil meets Hydric Soil Indicator, F-6, Redox Dark Surface.
 - C. This Soil formed under Wetland Conditions.
 - D. All of the above
8. **Closely examine the soil at 30 inches to 36 inches in depth from the top of soil pit. As you pull the soil out of the pit face, you will see many shiny, smooth surfaces on the ped (structural) faces. These are called “pressure faces”. What do pressure faces indicate in the soil?**
- A. The soil changes texture as the moisture content changes.
 - B. The soil shrinks and swells as the moisture content changes.
 - C. The soil becomes non-hydric as the moisture content changes.
 - D. The soil increases in clay content as the moisture content changes.
9. **High functioning estuaries are usually buffered by wetlands. This is highly dependant on land form. Which Answer best describes the land form at the Envirothon Soil Pit?**
- A. Fan /Escarpment
 - B. Hill/Side Slope
 - C. Depression/Flat
 - D. Beach Ridge/Fan Skirt
10. **Soils and land use in the watershed above an estuary have a huge effect on the quality and functioning of the estuary. Look at the plants immediately around the Envirothon Soil Pit. Which answer best describes the dominate type of herbaceous plants that are growing there?**
- A. Sedges and Rushes
 - B. Bluegrass and Dandelions
 - C. Ragweeds and Golden rod
 - D. Thistles and crabgrass
11. **There is a swale that crosses the lane about 75 feet north of the Envirothon Soil Pit. The 12 inch plastic culvert under the lane has been smashed almost shut due to inadequate soil cover over it to protect it from traffic. This swale connects to a ravine west of the Envirothon Soil Pit and eventually a giant wetland oxbow of the Auglaize River. Which answer best describes the impact that the road and culvert have on the wetland oxbow?**
- A. The oxbow will get little pieces of black plastic in it.
 - B. The oxbow will be deprived of nutrients and water pulses from the east side of the lane.
 - C. The oxbow will fill up with sediment.
 - D. The oxbow will have to be dredged and channelized to relieve the water pressure on the lane.

Use the soil map and tables provided to answer questions 12 – 23.

12. The depressional land form that the Envirothon Soil Pit is located contains a “Hydric” Soil (Soils that formed under wetland conditions) Inclusion. Map Units can contain other soils (components). According to the “Hydric Soils Table” what hydric soil component is likely to occur on drainageways in the “RrA” Soil Map Unit?

- A. Latty
- B. Mermill
- C. Paulding
- D. Sloan

13. Most estuaries have wetlands and hydric soils in or near them. According to the “Hydric Soils Table”, what could be the total percent of hydric soil components that are likely to occur on drainageways in the “RrA” Soil Map Unit?

- A. 3 percent
- B. 5 percent
- C. 10 percent
- D. 85 percent

14. According to “The Acreage and Proportionate Extent of the Soils” how many acres of Defiance County is considered the “RrA” Soil Map Unit?

- A. 329
- B. 4,126
- C. 22,726
- D. 32,470

15. You are an Environmental consultant evaluating the impact of runoff from a shopping mall to be built at this site. Carefully examine the Soil Map at the red “X” denoting the Envirothon Soil Pit. Directly west of the “X” is a swale that has grown up in a triangular patch of trees leading down to a long narrow “BvE” Soil Map Unit in the woods. What land form does the BvE Map Unit most likely represent?

- A. Flat
- B. Terrace
- C. Sand Dune
- D. Ravine

16. The “BvE” Map Unit (referred to in question 15) leads west, down to a long, very thin, semi-circular “W” Map Unit that connects to the Auglaize River. What does the “W” symbol denote?

- A. Winding Channel
- B. Windy Spot
- C. Water
- D. Wetzel clay loam, 0-2 percent slopes

17. Estuaries often form where two contrasting bodies of water meet. What land form does the “W” Map Unit (referred to in question 16) most likely represent?

- A. Springs
- B. Pond
- C. Lake
- D. Oxbow

18. The nature and character of wetlands in and surrounding estuaries are directly related to the wetlands upstream from them. Organic Matter is one of the most reactive portions of the soil in ability to store and release nutrients.

According to “The Physical Soil Properties Table” what is the highest Percent Organic Matter for both the “Pd” and “Sh” Soil Map Units in their surface layer?

- A. 0.1
- B. 3.0
- C. 5.0
- D. 10.0

19. Soil Erosion above an estuary can smother plants, fish eggs and mollusks and or dramatically reduce their ability to function. The erodibility of a soil horizon by water is measured the “Kw” value assigned to it. According to “The Physical Soil Properties Table” what is the Kw value for the “RrA” Soil Map Unit at the 0-9 inch depth?

- A. .24
- B. .28
- C. .37
- D. .43

20. The higher the “Kw” value, the more susceptible a soil is to erosion. According to “The Physical Soil Properties Table” which soil is more susceptible to erosion in the surface layer?

- A. Pa
- B. RrA
- C. RsA
- D. No differences

21. Ponding of water on the surface of the soil is one of nature’s ways to slow runoff and precipitate sediment that would otherwise cause damage downstream. According to the “Water Features Table” what months of the year would you expect ponding to occur on the “Pd” Soil Map Unit.?

- A. January-May
- B. January-April
- C. January-June
- D. January-December

22. Water pulses in healthy estuaries flow back and forth, from both downstream and upstream sources on a regular basis. According to the “Water Features Table” what is the “Frequency” of Flooding for the periods of January-June and October-December on the “Sh” Soil Map Unit down by the oxbow near the Auglaize River?

- A. Brief
- B. Occasional
- C. Frequent
- D. None

General Soil Questions:

23. What Agencies provide Soil Survey Information?

- A. Ohio Cooperative Extension Service
- B. Ohio Department of Natural Resources
- C. U.S.D.A. Natural Resources Conservation Service
- D. All of the Above

Forestry Station Questions:

24. Estuaries are often “Sinks” that accumulate nutrients and carbon in their soil. Certain tree species are adapted to grow best on a certain drainage class of soil. Select the drainage class of soil that Black Willows grow best on.

- A. Excessively Well Drained
- B. Well Drained
- C. Moderately Well Drained
- D. Poorly Drained

Aquatics Station Questions:

25. Freshwater estuaries are commonly separated from the adjacent main body of water by a barrier spit or bay mouth bar. Spits and bars are usually accumulations of what kind of materials?

- A. Clay and Concrete
- B. Muck and Mud
- C. Nutrients and Toxins
- D. Sand and Gravel

26. Dredging and filling are some of the biggest threats to estuaries in the U.S. If you saw an estuary being dredged or filled, who, would you call to check if the proper permits had been filed?

- A. Army Corp of Engineers
- B. Chamber of Commerce
- C. Health Department
- D. Ducks Unlimited

Current Environmental Issue Station Questions:

27. Unplanned Urban Development (Houses, buildings, streets, roads, malls and parking lots) is a huge threat to estuaries by rerouting, interrupting and polluting the natural flow of water. Camp Lakota was built at the confluence of Powell Creek and the Auglaize River. What problems could development and associated construction activities have caused downstream from the camp over time?

- A. Construction of the Lake could have caused sedimentation downstream.
- B. Placement of fill from constructing the Lake could have changed the natural flow patterns of runoff surrounding the confluence downstream.
- C. Septic load from large groups of visitors could have degraded water quality downstream.
- D. All of the above.

28. BMPs are “Best Management Practices” to reduce runoff, pollution and associated impacts from Urban Development. Soil and Water Districts often play a major role implementing these practices. Which BMPs listed below could aid in lessening the impact of development near a Fresh Water Estuary?

- A. Wetland Restoration
- B. Pervious Pavement
- C. Storm Water Detention Basins
- D. All of the above