

## Soil Horizons (Is it a Wetland?)

## Teacher's Guide

**Subject:** Integrated Science (Life; Earth-Space; Physical)

**Topics:** Wetlands, Soil, Abiotic Factors, Classification

**Summary:** Students examine and classify the soil at two different locations along the nature trail to determine which site is a wetland.

After completing the field lab, students will be able to:

**Objective(s):**

1. Identify wetland soil based upon its characteristics (moisture, texture, etc.)
2. Discuss the advantages and any disadvantages of wetland areas

**Ecosystem(s):** Freshwater Wetlands, Uplands

### Equipment:

- soil auger
- Munsell charts (10YR)
- GPS
- Sand Gauge Card
- data sheet & pencil
- meter stick
- Petri dishes
- tables
- spray bottle
- cardboard

### Background (Pre-field Classroom Activity)

- Reference Material: Soil profiles and horizons introduction, Wetlands of Florida (poster), *Wetland Soils in Living Color, Part I*(Project WET), Fabulous Wetlands (Video)  
<http://www.mbgnet.net/fresh/wetlands/why.htm>
- Vocabulary: Crossword, Vocabulary, Word Search (Pre-activities)
- Equipment: Munsell Color Chart, GPS Practice Activity

### Sunshine State Standards

**Science:** SC. A.1.3.1; SC.D.1.3.1-4; SC.G.1.3.4-5; SC.G.2.3.2-3; SC.H.1.3.4-7; SC.H.2.3.1

**Language Arts:** LA.A.1.3.3; LA.B.2.3.1; LA.C.1.3.1

**Mathematics:** MA.B.2.3.1;

**Social Studies:** SS.A.6.3.2; SS.B.2.3.9

**Soil Horizons (Is it a Wetland?)****Student Data Sheet****General Information**

Full Name:		Date:	
School (teacher):		Time:	

**Student Hypothesis and Rationale:**

If soil type is determined by color texture and moisture, than I hypothesize that I (Choose one: **will/will not**) observe difference between an upland soil and a wetland soil because... \_\_\_\_\_

**Field Observations/Measurements/Data****Location 1:**

Latitude:		Longitude:	
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**Table 1 (soil color and moisture)**

Horizon #	Horizon Depth (cm from the surface)	Munsell Chart (value/chroma)	Munsell Chart Color Description	Moisture (wet, damp or dry)
1				
2				
3				
4				

**Table 2 (soil texture and composition)**

Horizon #	Texture (gritty, slippery, sticky)	Content (Sand, silt, clay, or topsoil)	Grain Size (coarse, medium, fine, or very fine)
1			
2			
3			
4			

**Soil Horizons (Is it a Wetland?)****Student Data Sheet  
Continued****Location 2:**

Latitude:	Longitude:
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**Table 1 (soil color and moisture)**

Horizon #	Horizon Depth (cm from the surface)	Munsell Chart (value/chroma)	Munsell Chart Color Description	Moisture (wet, damp or dry)
1				
2				
3				
4				

**Table 2 (soil texture and composition)**

Horizon #	Texture (gritty, slippery, sticky)	Content (Sand, silt, clay, or topsoil)	Grain Size (coarse, medium, fine, or very fine)
1			
2			
3			
4			

## Soil Horizons (Is it a Wetland?)

## Assessment

1. What are the color, texture, and moisture of the third horizon in Location #2? (refer to your data sheets)

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2. Describe the moisture of the soil of location #1 compared to location #2. What can this tell you?

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3. Look at your hypothesis. Does your data support your hypothesis? Whether your hypothesis was supported or not, what conclusions can you come to based on your observations, measurements, and results?

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4. If wetlands are found near bodies of water, describe some locations that we might find wetlands.

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5. Wetlands help to capture, store, and slowly release excess water in the environment. Describe what would happen if we removed wetlands from a particular area.

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6. Think about what you learned in this lab; has it generated any new questions? Write a new question about something you want to learn more about.

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## Why Are Wetlands Important?

### The Role of Wetlands in an Ecosystem

Wetlands prevent flooding by holding water and help keep river levels normal and filter and purify the surface water.



Wetlands

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Wetlands accept water during storms and whenever water levels are high. When water levels are low, wetlands slowly release water.

Wetlands also release vegetative matter into rivers, which helps feed fish in the rivers. Wetlands help to counter balance the human effect on rivers by rejuvenating them and surrounding ecosystems.

Many animals that live in other habitats use wetlands for migration or reproduction. For example, herons nest in large old trees, but need shallow areas in order to wade for fish and aquatic life. Amphibians often forage in upland areas but return to the water to mate and reproduce.



A Marsh in Scotland

While wetlands are truly unique, they must not be thought of as isolated and independent habitat. To the contrary, wetlands are vital to the health of all other biomes and to wildlife and humans everywhere.

Unlike most other habitats, wetlands directly improve other ecosystems. Because of its many cleansing benefits, wetlands have been compared to kidneys. The analogy is good one. Wetlands and kidneys both help control water flow and cleanse the system.

### Erosion Control

Looking at pictures of [deltas](#), one can tell that rivers deposit a lot of sediment into the ocean. The sediment is from top soil that has been eroded and washed away.

**Emergents** (plants firmly rooted in the muddy bottom but with stalks that rise high above the water surface) are able to radically slow the flow of water. As a result, they counter the erosive forces of moving water along lakes and rivers, and in rolling agricultural landscapes. Erosion control efforts in aquatic areas often include the planting of wetlands plants.

### Wetlands and Water Purification

Wetlands also clean the water by filtering out sedimentation, decomposing vegetative matter and converting chemicals into useable form.

The ability of wetlands to recycle nutrients makes them critical in the overall functioning of earth. No other ecosystem is as productive, nor as unique in this conversion process. In some places artificial wetlands were developed solely for the purpose of water purification. <http://www.mbgnet.net/fresh/wetlands/why.htm>