



2011 SOIL ECOLOGY SOCIETY MEETING



THE UNIVERSITY OF BRITISH COLUMBIA
OKANAGAN CAMPUS
MAY 24 - 27, 2011



a place of mind

TEACHING WORKSHOP INFORMATION

Dr. Loren Byrne from the Roger Williams University will be leading a workshop on incorporating soil ecology into teach on Tuesday, May 24, from 1-4 pm.

How does soil ecology fit within environmental literacy and citizenship? Environmental education initiatives are coalescing around the concepts of environmental literacy and citizenship, ideas that focus our attention on what people should know and do about environmental issues.

As environmental scientists, soil ecologists can contribute much to the dialogue about the essential components of environmental literacy and citizenship. In this workshop, participants will explore the place of soil ecology and soil ecologists within general environmental education curricula and programs, including K-12, college, and public outreach contexts. In addition to discussing environmental literacy and citizenship issues more generally, the following questions, among others, may be discussed as part of this exploration:

How do soils and their ecology fit into the broader realm of environmental education?

What should all people know about soil ecology to be considered environmentally literate?

What behaviours should environmental citizens support and engage in with regard to soil management?

How can learners of all ages be convinced to care about soils and their ecology?

What case studies can be used to best improve people's soil ecological literacy and citizenship?

How can soil ecology be taught most effectively in non-majors science courses and public education programs?

2011 Soil Ecology Society meeting – Soil Ecology in Environmental Literacy Workshop

1. You meet an Alien Life Form (ALF) and are curious about its “environmental literacy” (however you understand it at this moment). What **questions** would you ask ALF to determine if it is environmentally literate?



2. What is your current understanding of environmental literacy? In other words, what is environmental literacy? Please provide a brief definition or description of key components.

3. What three things should a person know about soils & their ecology to be considered environmentally literate?

- 1.

- 2.

- 3.

Welcome to the 2011 SES teaching workshop!

How does soil ecology fit within environmental literacy & citizenship?

Loren Byrne, Roger Williams University



Early 90s

US EPA Nat'l Env Ed Act
& Office of Env Ed



Vision: People use env knowledge for env stewardship

2003 The CELP Mandate – Canadian
Environmental Literacy Project

→ to develop open-access curriculum materials in support of teaching environmental studies in universities, colleges, and high schools in Canada.

Environmental Literacy IN AMERICA

What Ten Years of NEETF/Roper
Research and Related Studies Say
About Environmental Literacy in the U.S.

THE NATIONAL ENVIRONMENTAL EDUCATION
& TRAINING FOUNDATION



Fully 95% of adults
and 96% of parents
support the practice of
teaching school children
about the environment.

**...but ~98% are
environmentally
illiterate**


Search

NEW~

Summit Proceedings now available here

Dates

October 14, 2010 8:00 am ~

October 15, 2010 2:00 pm

Place

National Education Association
Headquarters Auditorium
1201 16th St NW
Washington DC 20036

Co-organizers

Ecological Society of America
National Education Association

Questions?

Contact: education@esa.org

6118 reads

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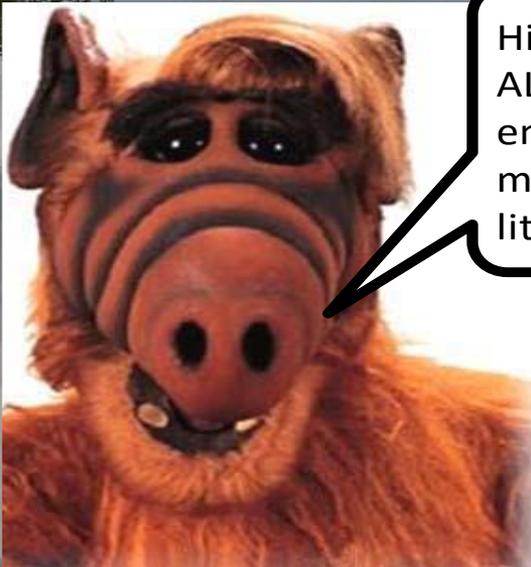
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What is literacy??

Does it differ from
knowledge & intelligence?

What skills are involved?

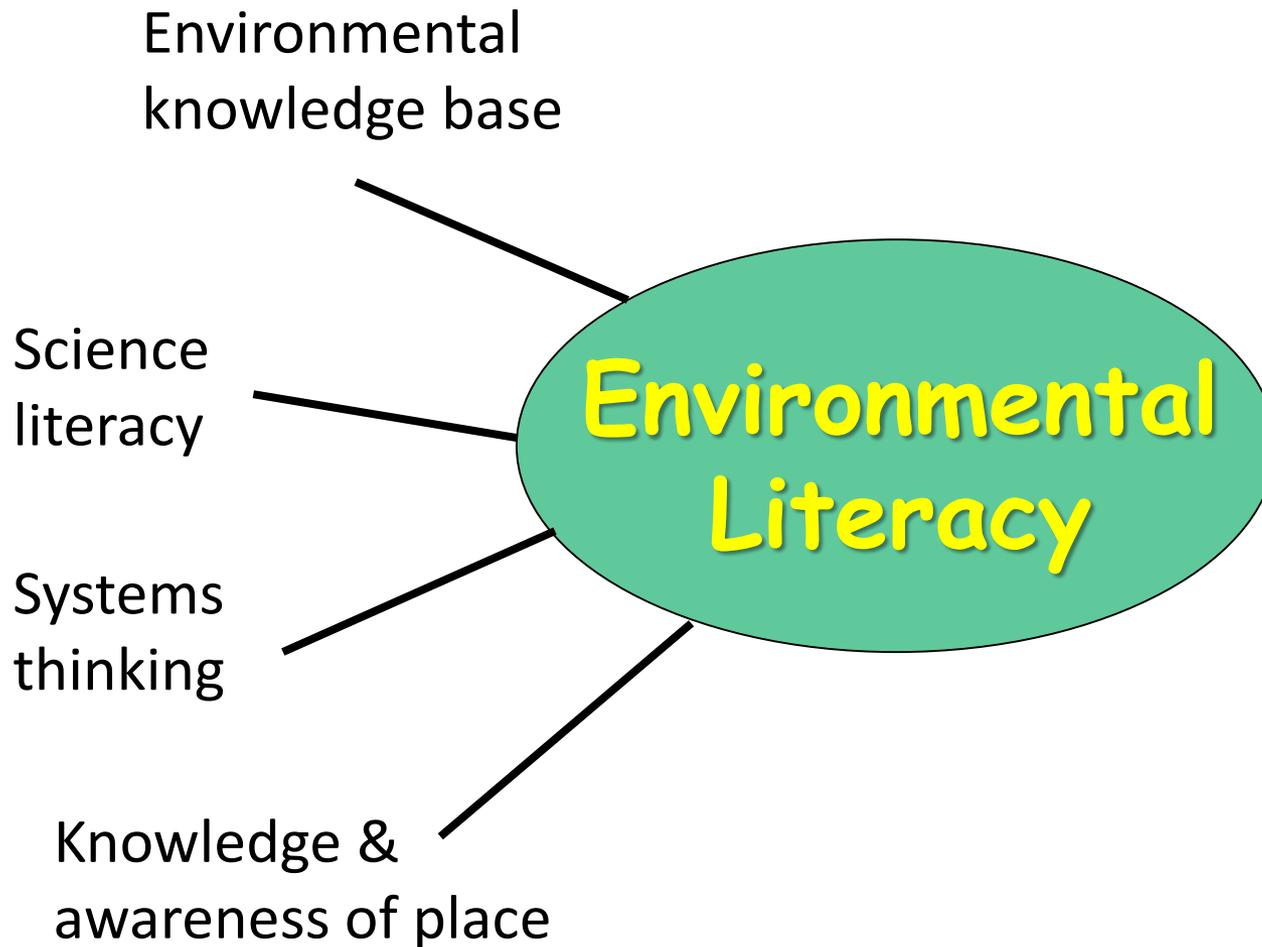
What is environmental literacy?



Hi! I'm ALF. Am I environmentally literate?

Environmental Literacy for a Sustainable World

94 people provided 333 response items

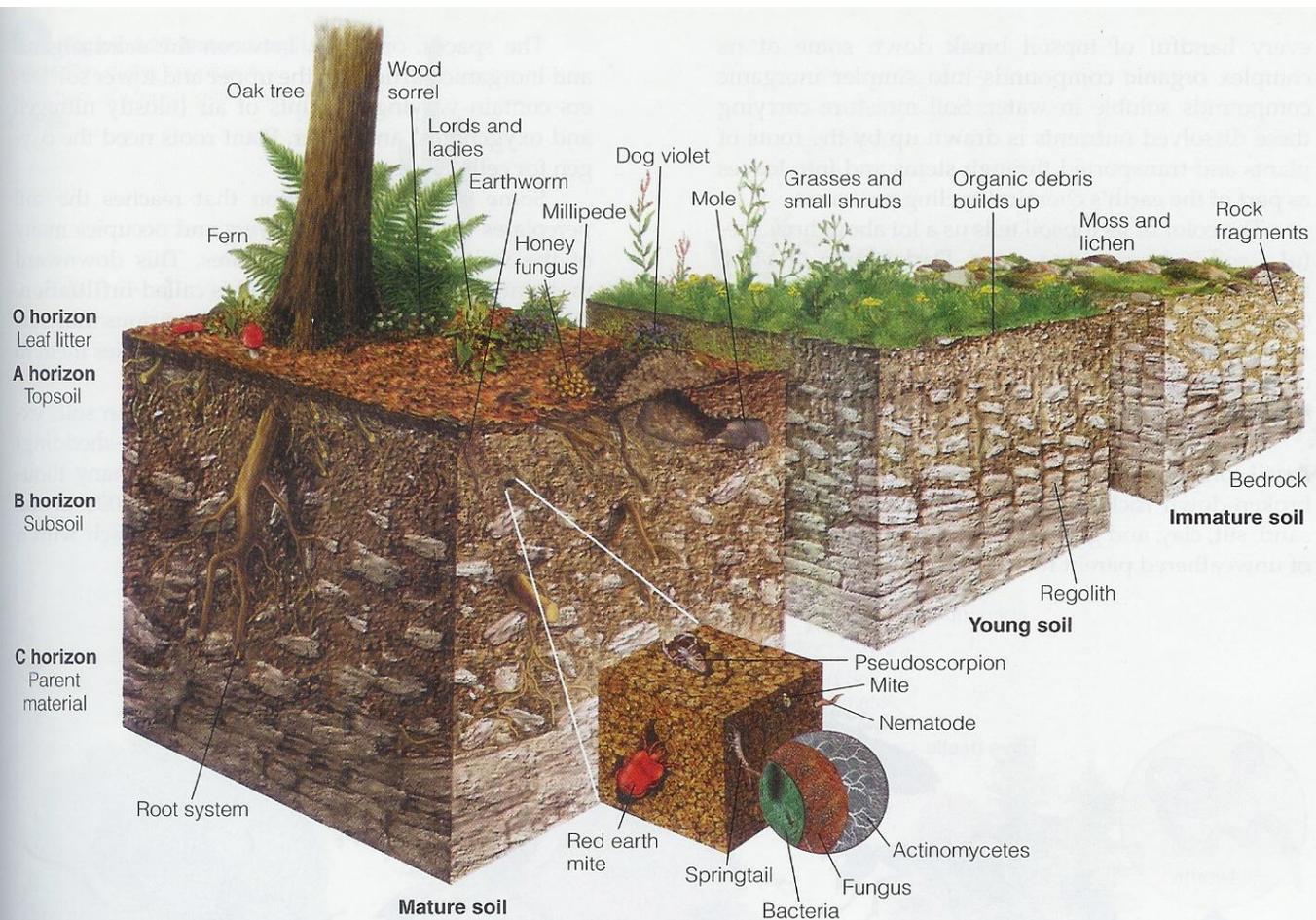


What
about
soils?

Do they
have a
place?

What is soil ecological literacy?

What essentials should all people know?



1. List 3
2. Share, Compare & Discuss (groups of 3-4)
3. Synthesize & Prioritize
4. Report out
5. Vote??



Air & Climate



Land



Water



Ecosystems



Energy



Food



Environment
& Society

Soil

Soils are the loose materials that cover the Earth's surfaces, an accumulation of particles of rock, minerals, microorganisms, and other organic matter formed by weathering and other natural processes. Soils form continuously, but very slowly ? only about one inch forms every 500 to 1,000 years. Bedrock exposed to weathering starts the process of creating nearly all soils.

Weathering, and the speed at which it occurs, is driven by water, wind, and temperature. It is the continual breakdown of debris that results in soil formation.

Soils are a mix of inorganic mineral particles, organic matter, air and water. The mineral particles ? sand, silt, or clay ? contain a variety of chemicals, many of which are utilized for plant growth. Organic matter, typically from plants and/or small organisms that have died and decayed, provides nutrients to the soil which are essential for fertility. The ability of soil to retain and transport water is an important factor in bringing nutrients to plants. However, plant and animal life also needs oxygen for their survival; therefore, a balance between air and water in the soil is extremely important.



The composition of a soil, along with a variety of characteristics, is what makes up a soil's properties. It is these properties, and the degree to which they appear, that provide for the level of soil quality. Mineral and organic particles make up about half of a soils volume; pores containing air and water make up the remaining volume. Soils vary in composition, but generally consist of four main mineral types: sand, silt, clay, and loam. Sandy soils have a coarse texture, clay soils have a sticky texture, and silt particles, which are smaller than sand particles but larger than clay particles, give soil a silky, powdery texture. Soils in which all three minerals contribute equally to their texture are called loam soils and thought to be best for agriculture.

“Soils are dynamic ecosystems ... thought to be one of our most fundamental natural resources.

Vital, healthy soils are critical in cycling nutrients and necessary in sustaining plant growth.

Without (these), life on Earth would not be possible...”

Search**GO****Education**

- ▶ [Soil Facts](#)
- ▶ [Key Messages](#)
- ▶ [State Soils](#)
- ▶ [Water Movement in Soil](#)
- ▶ [Twelve Orders of Soil](#)

Soil Education

The WMV file requires [Windows Media Player](#) and the PDF file requires [Acrobat Reader](#).

- [Soil Facts](#) -- definitions of soil and soil survey, information on careers, some basics on soil formation and o
- [Key Messages](#) -- 10 key messages to understanding soils
- [Soil -- Fundamental Concepts](#) (PDF; 541 KB)
 - [handout](#) (PDF; 277 KB)

USDA's fundamental concepts list emphasizes physicochemical properties and soil science at the exclusion of soil ecology

“Helping People
Understand Soils”

Ten Key Messages

From the USDA-NRCS

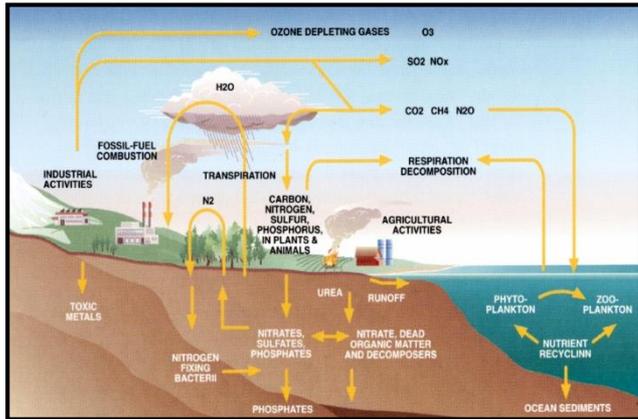
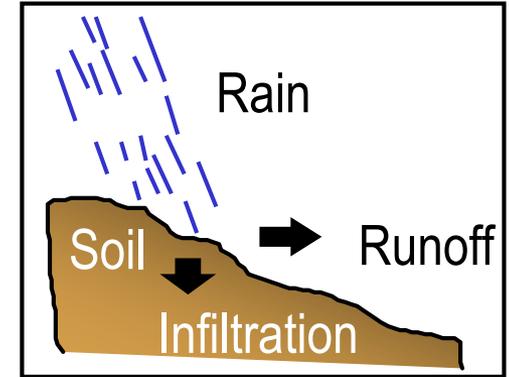
<http://soils.usda.gov/education/>

Soils Perform Vital Functions



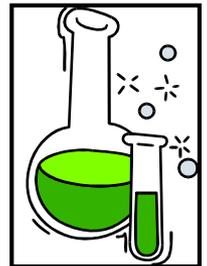
Sustaining plant and animal life below and above the surface

Regulating and partitioning water and solute flow



Filtering, buffering, degrading, immobilizing, and detoxifying

Storing and cycling nutrients

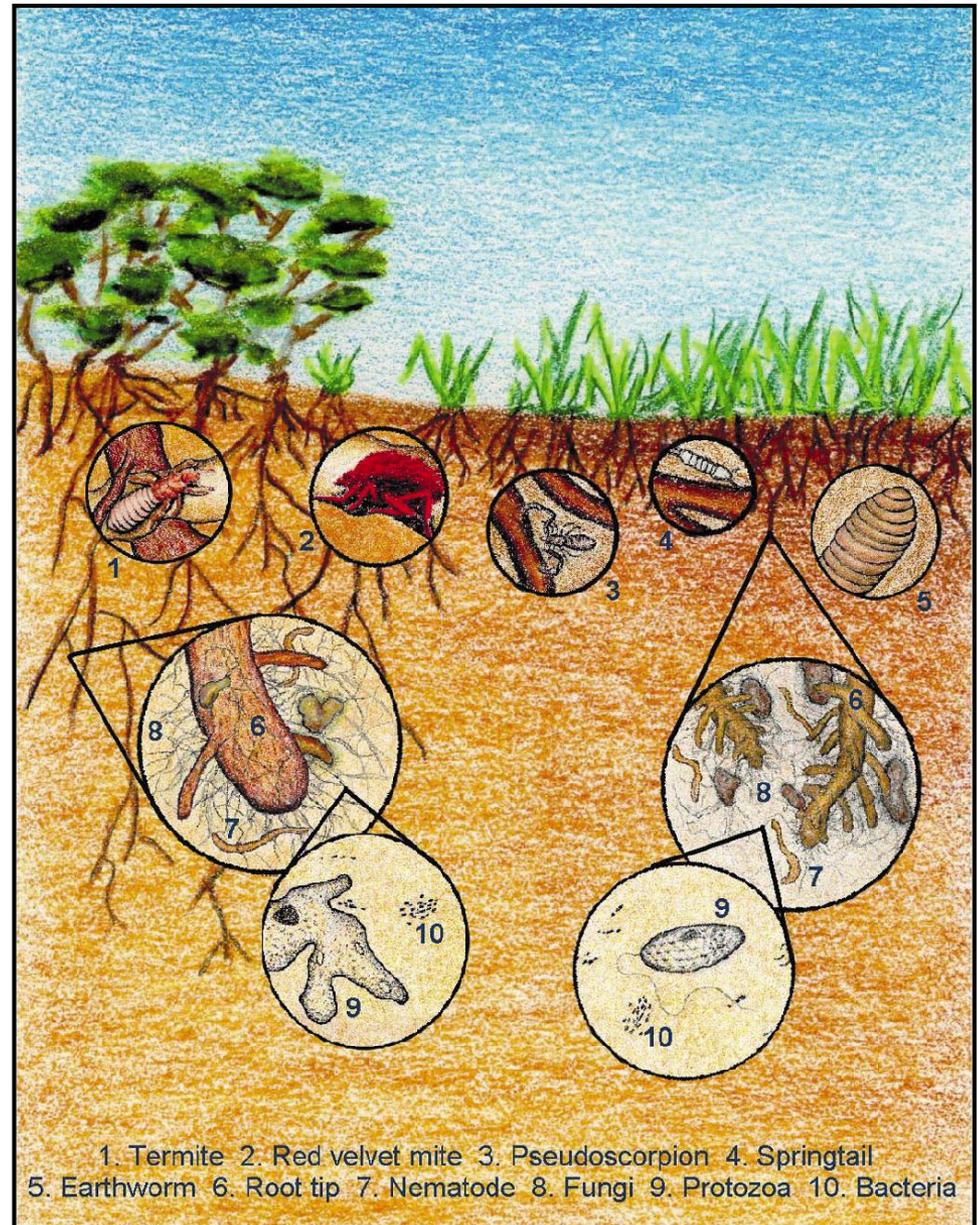


Providing support to structures



Soil is the Basis of the Ecosystem

The living systems occurring above and below the ground surface are determined by the properties of the soil. We often ignore the soil because it is hard to observe.



Soils Support Life

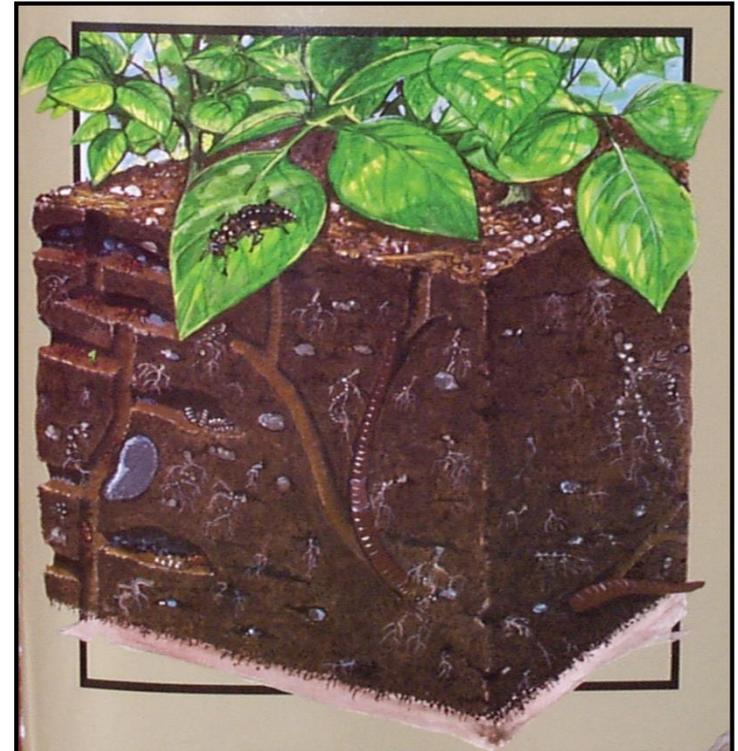


Organism Types

bacteria
fungi
protozoa
nematodes
arthropods
earthworms

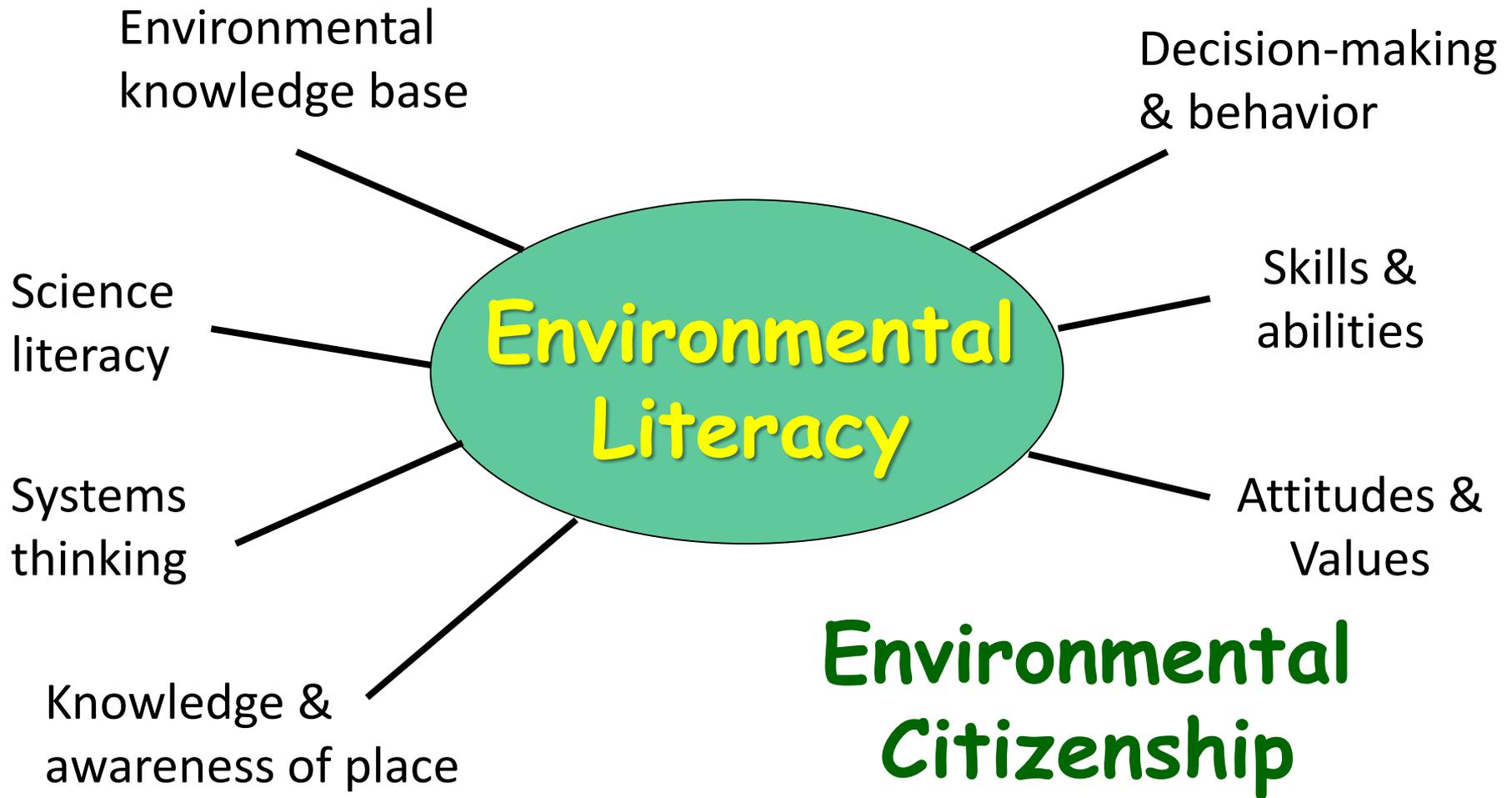
Roles & Benefits

decomposition
release nutrients
create pores
stabilize soils



Environmental Literacy for a Sustainable World

94 people provided 333 response items



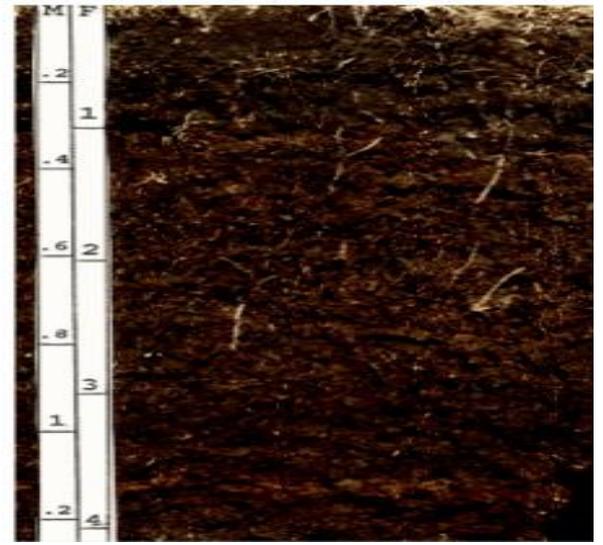
What is Environmental Citizenship?

- Functional environmental literacy
- Engaging in environmentally responsible behaviors
- Taking political & public actions
- Environmental stewardship

SOIL Environmental Citizenship?

What is

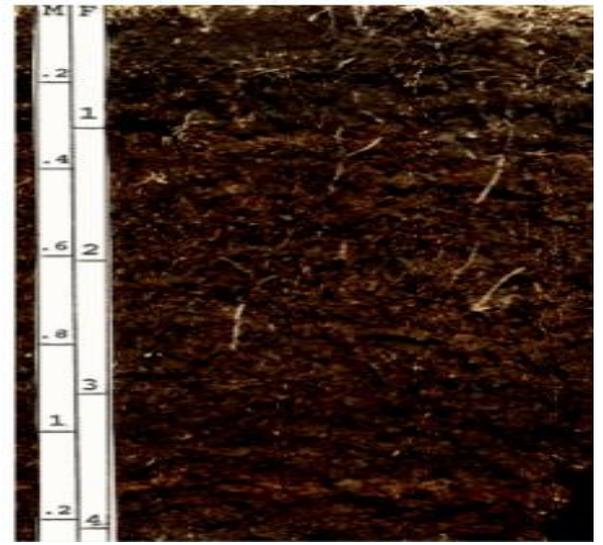
→ What should people do regarding soils if they are environmentally literate?



SOIL Environmental Citizenship?

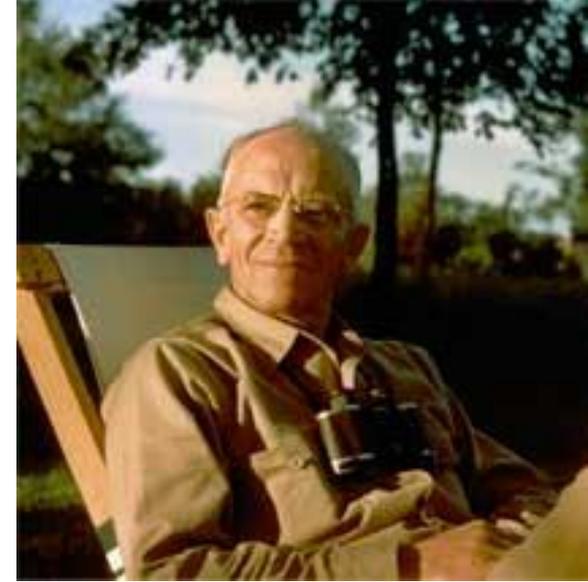
What is

→ What other citizenship behaviors can we link soil stewardship to?



“Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals.”

-Aldo Leopold, A Sand County Almanac



“The nation that destroys its soil, destroys itself.”

- Franklin Delano Roosevelt

How can we better engage people about soil ecology?

→ Communicate

→ Connect

→ Care

National Association of Conservation Districts

NACD's mission is to serve conservation districts by providing national leadership and a unified voice for natural resource conservation.



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Policy

Stewardship Program • Education Resources • Canon Envirothon • Contests • Marketplace

Soil Education Resources

Is soil an important ingredient in your every day life?

The answer is yes, and here are a few reasons why:

- Last night you slept in a building built on soil.
- You drink water that flows through soil and is cleaned by the soil.
- You breathe air that comes partly from plants growing in the soil.
- You even wear clothes made from plants that grow in the soil.

Soils make our lives possible. We build on them, play on them, drive on them, eat food grown in or raised on them, take medicines from them, wear clothes we wouldn't have without soils, drink water that wouldn't be clean without soils, breathe air we wouldn't have without the plants and trees growing in soils. The entire earth—every ecosystem, every living organism—is dependent upon soils.



<http://www.nacdnet.org/education/resources/soils/>

How can we better engage people about soil ecology?

Blog entries

- Student created one:

<http://downdirtysoilecology.blogspot.com/2010/11/soil-quality-vs-soil-health.html>

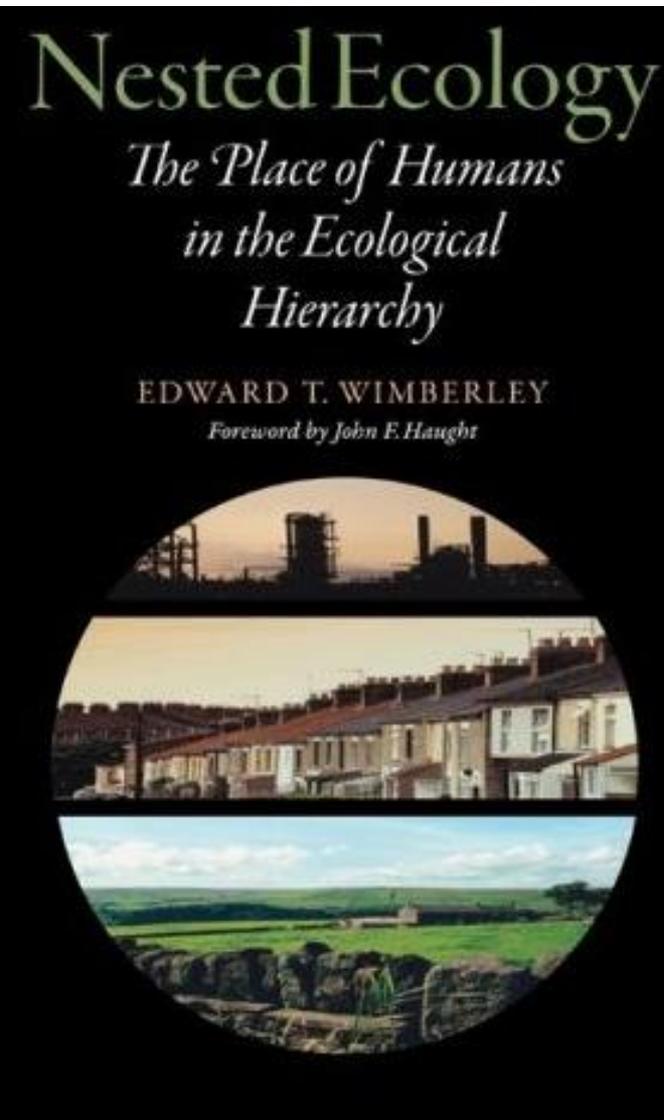
Videos

- <http://www.youtube.com/watch?v=zv2JNaqnYxU>

Websites

- <http://www.blm.gov/nstc/soil/Kids/index.html>
- <http://school.discoveryeducation.com/schooladventures/soil/index.html>

Connecting people to the environment



A focus on Personal ecology

Individual's relationship to
the environment:

worldview (*religion, politics*)

ethics

behaviors

When, how & why did your personal soil ecology develop?

What examples/case studies might be useful for connecting people to soil & increasing soil ecological literacy?

Reflective Moment, Wrap-Up Discussion & Future Directions

