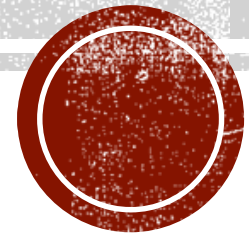


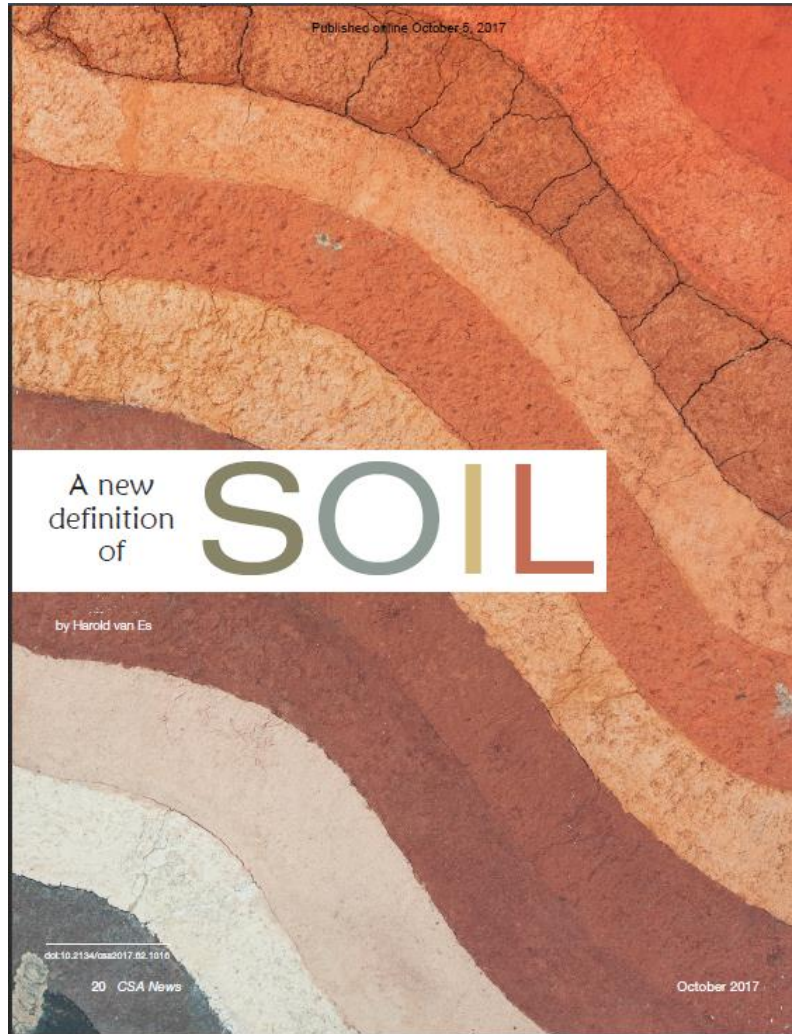
ABCs of Forest Soils

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New England Region Council on Forest Engineering Workshop
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1. WHAT IS SOIL?



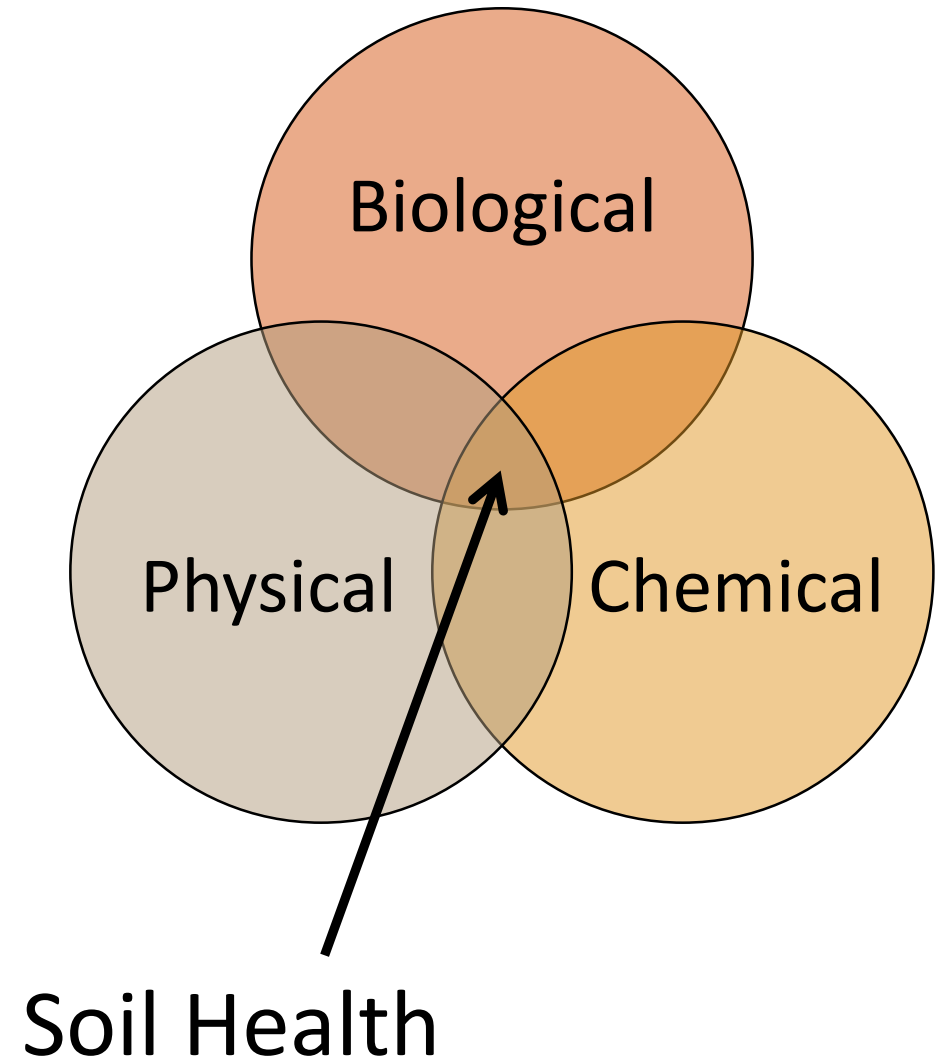
The layer(s) of generally loose mineral and/or organic material that are affected by physical, chemical, and/or biological processes at or near the planetary surface and usually hold liquids, gases, and biota and support plants.



2. CONTEMPORARY CONCEPTS IN SOILS

SOIL HEALTH

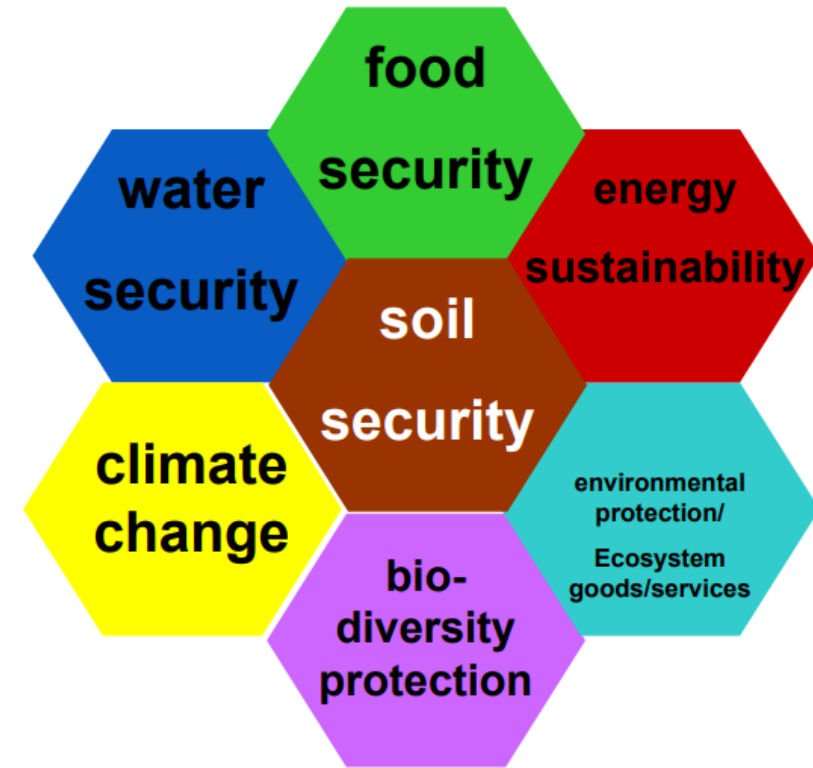
- Also referred to as “Soil Quality”.
- Only living things can have “health”.
- Defines the soil as a living system with physical, chemical, and biological components.



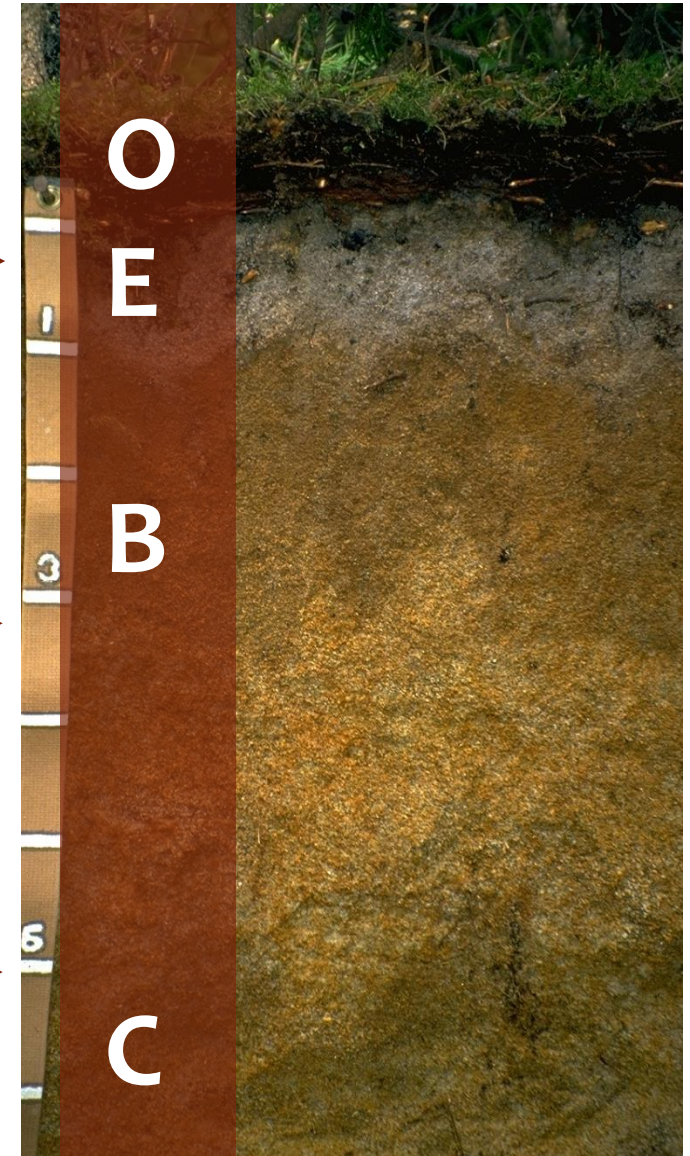
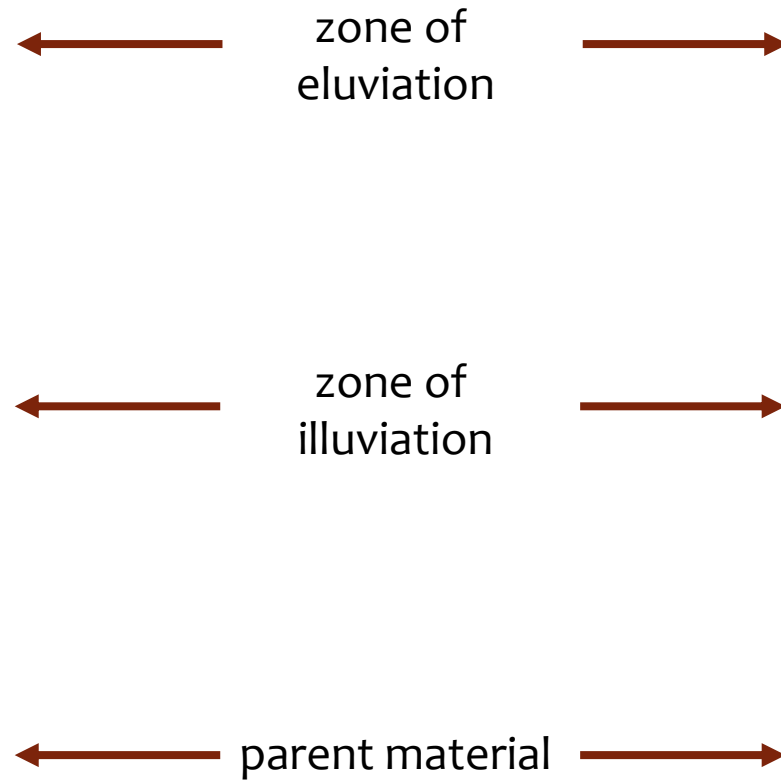
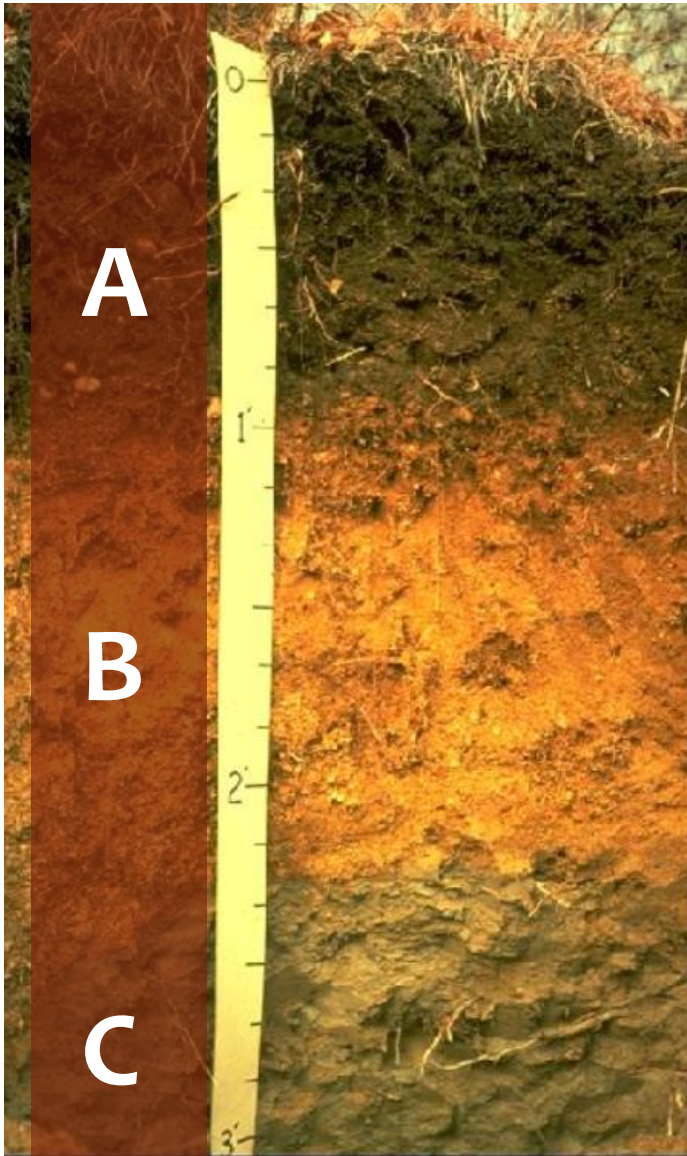
2. CONTEMPORARY CONCEPTS IN SOILS

SOIL SECURITY

...concerned with the maintenance and improvement of the world's soil resource to produce food, fiber and freshwater, contribute to energy and climate sustainability, and maintain the biodiversity and the overall protection of the ecosystem.

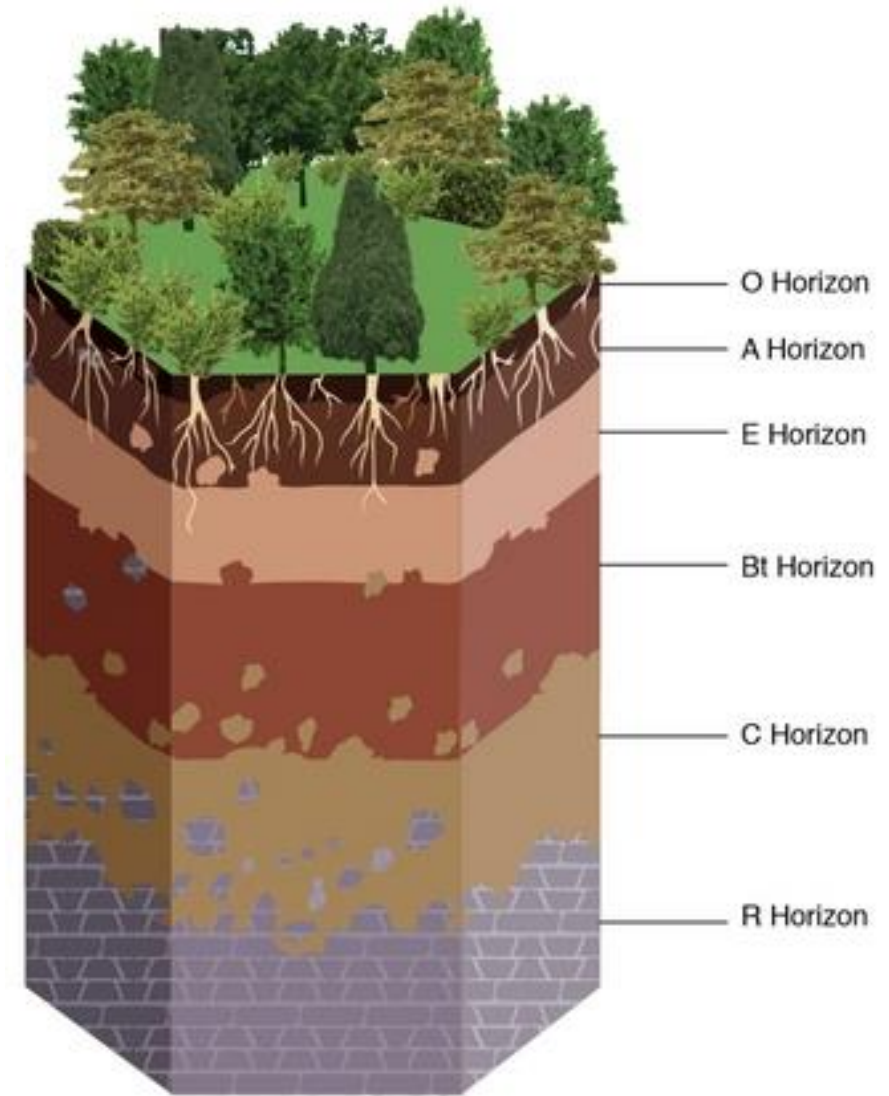


3. SOIL HORIZONS (LITERALLY ABC!)



4. WHAT MATTERS IN FOREST SOILS?

- Parent Materials
- Soil Drainage
- Organic Matter

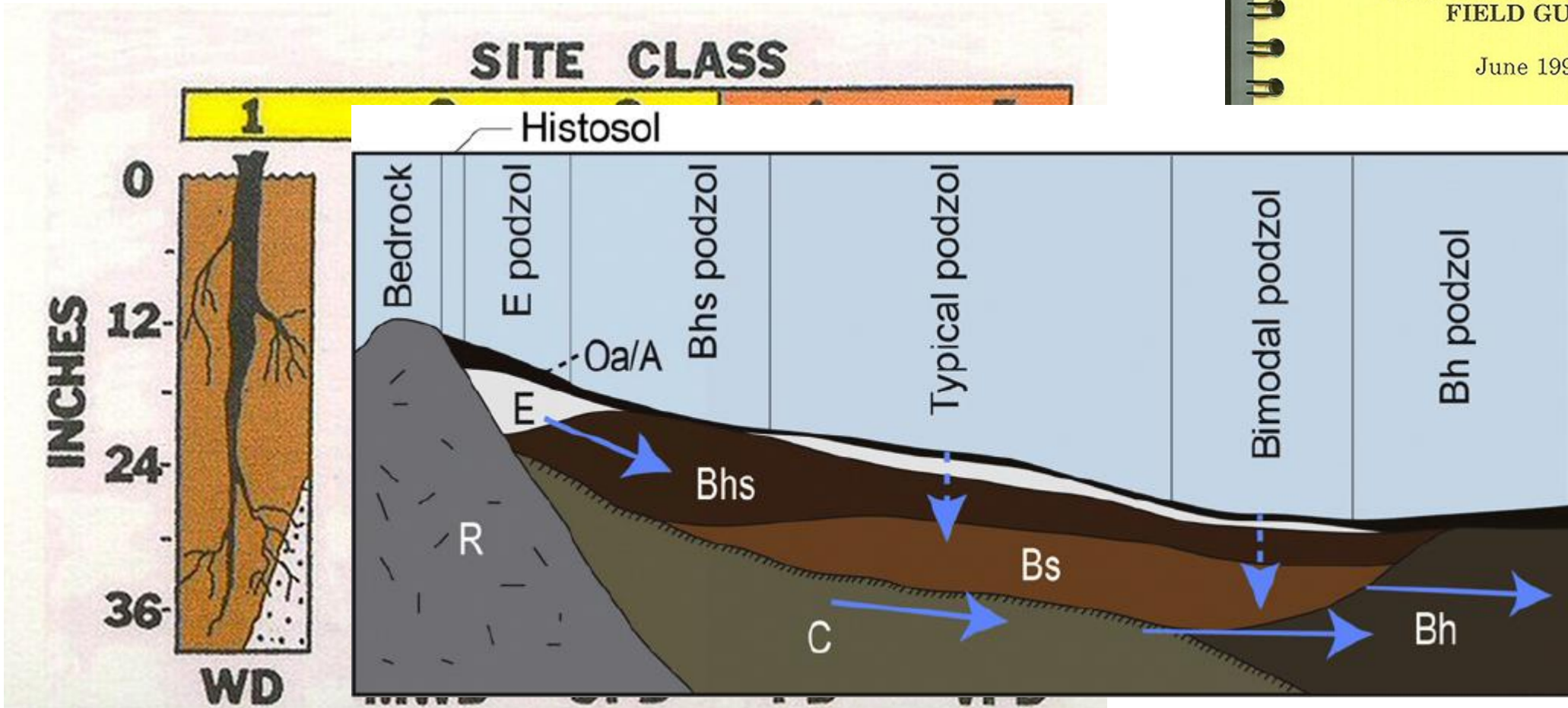
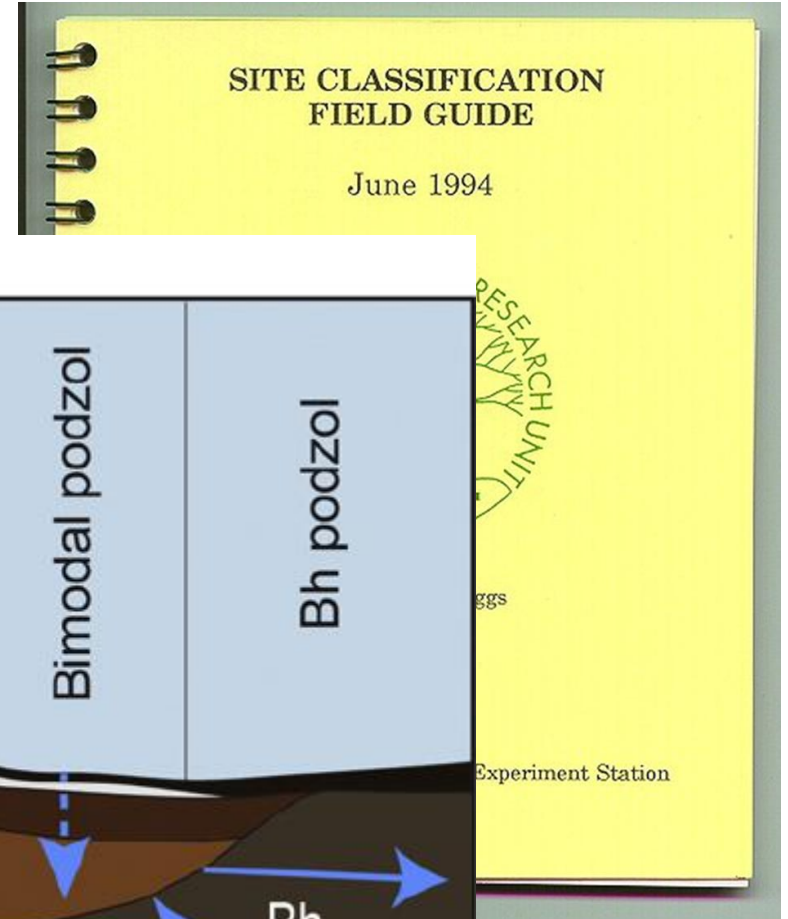


PARENT MATERIALS

- Sediments
- Outwash
- Till
- Organic



SOIL DRAINAGE CLASSES



Adapted from Stone et al. (1963)

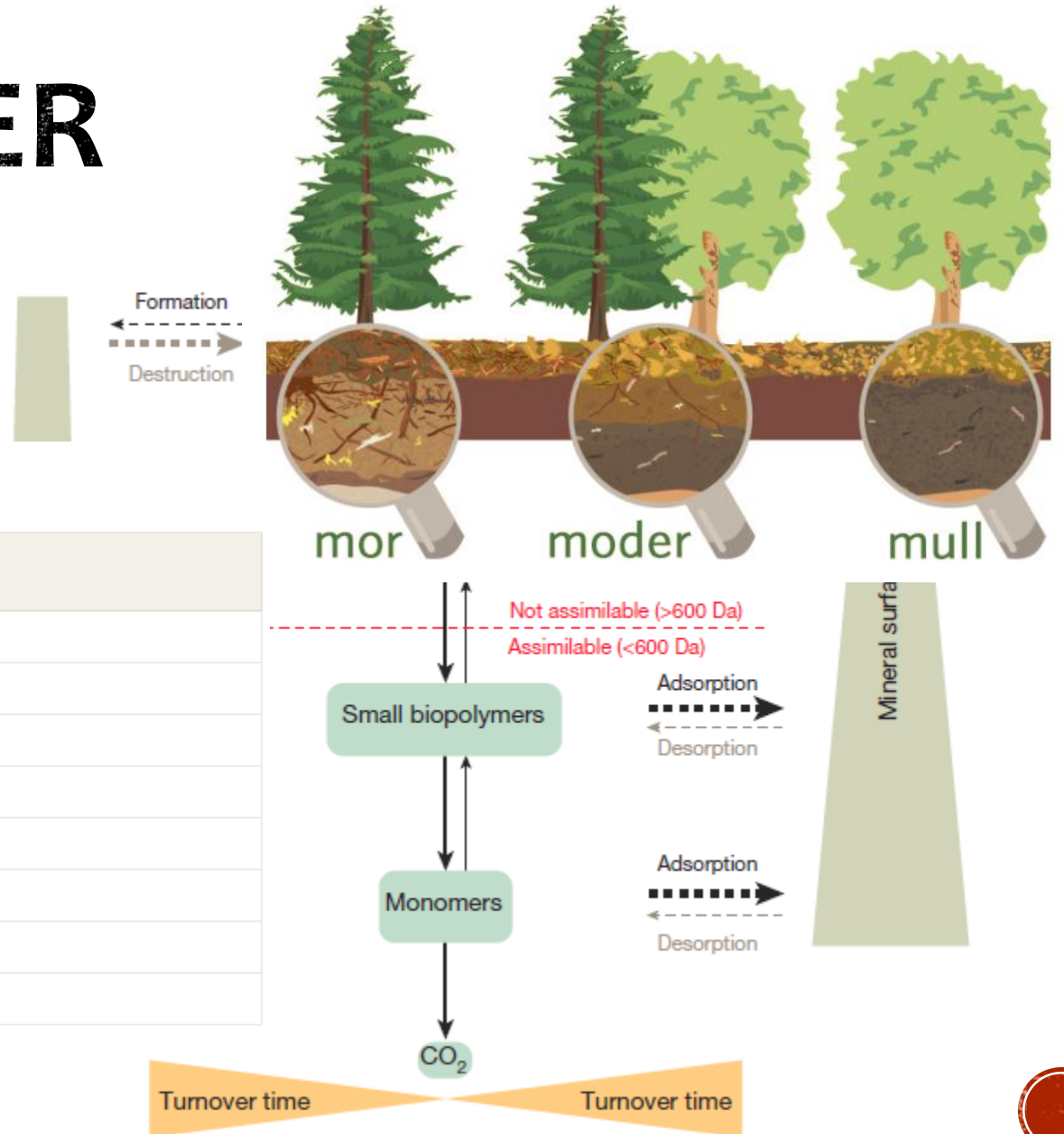


ORGANIC MATTER

■ The forest floor

Summary of Humus Form Taxa

MOR order	MODER order	MULL order
Group	Group	Group
Hemimor	Mormoder	Vermimull
Hemimor	Leptomoder	Rhizomull
Resimor	Leptomoder	Hydromull (wet)
Lignomor	Lignomoder	
Hydromor (wet)	Hydromoder (wet)	
Fibrimor (wet)	Saprimoder (wet)	
Mesimor (wet)		



5. YOU KNOW IT'S A FOREST SOIL WHEN...

- “Pit and Mound” is not a new breed of dog!

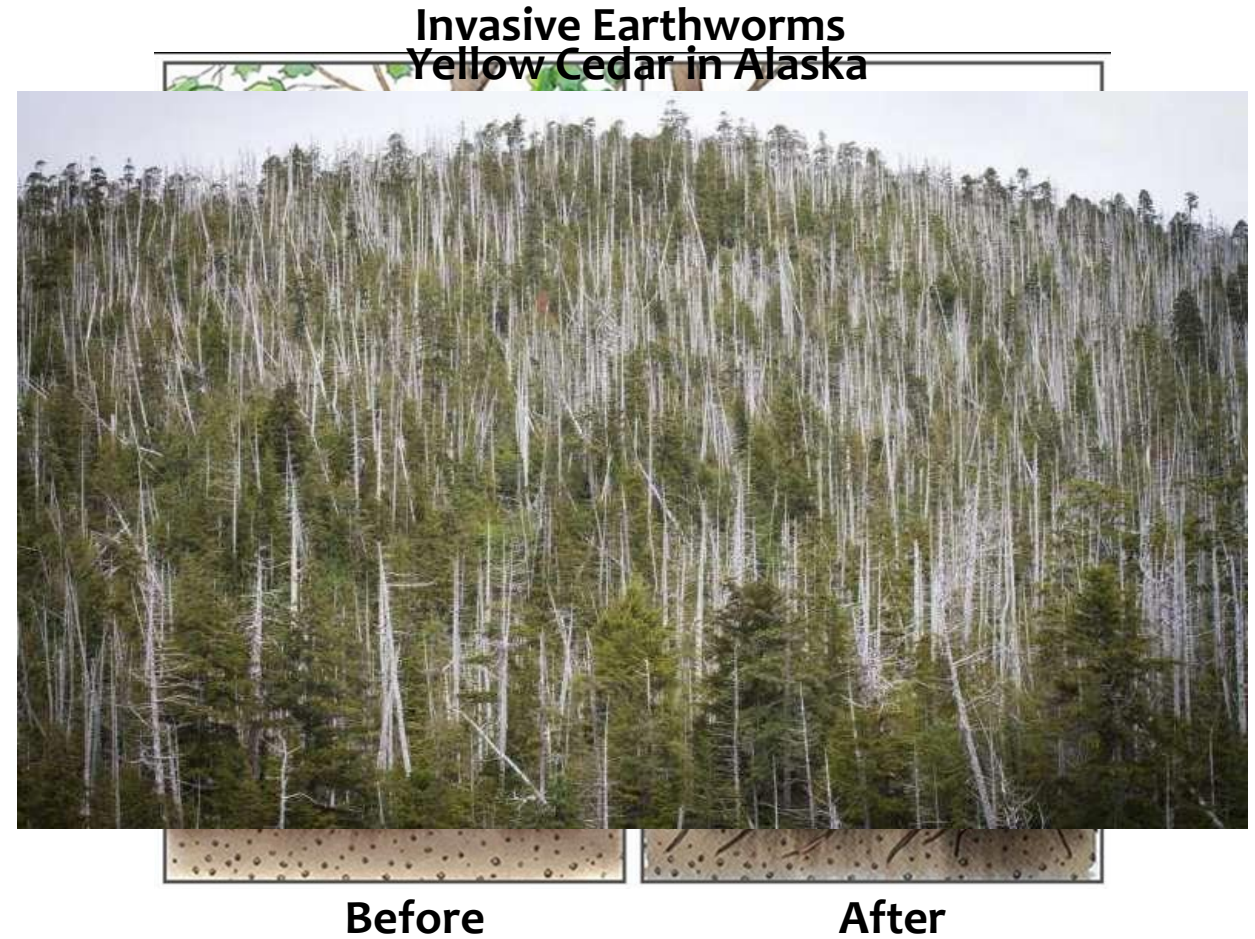


<https://i2.wp.com/nsforestnotes.ca/wp-content/uploads/2017/08/bbb.jpg>



5. YOU KNOW IT'S A FOREST SOIL WHEN...

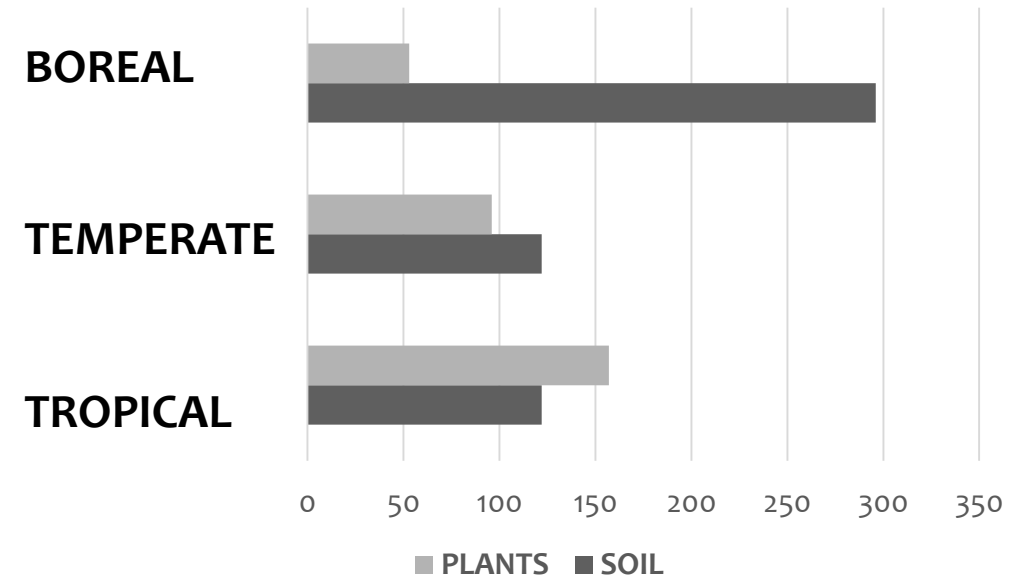
- worms are bad, snow is good!



5. YOU KNOW IT'S A FOREST SOIL WHEN...

- it has more carbon than the trees!

World Forests Carbon Density
(Mg/ha)

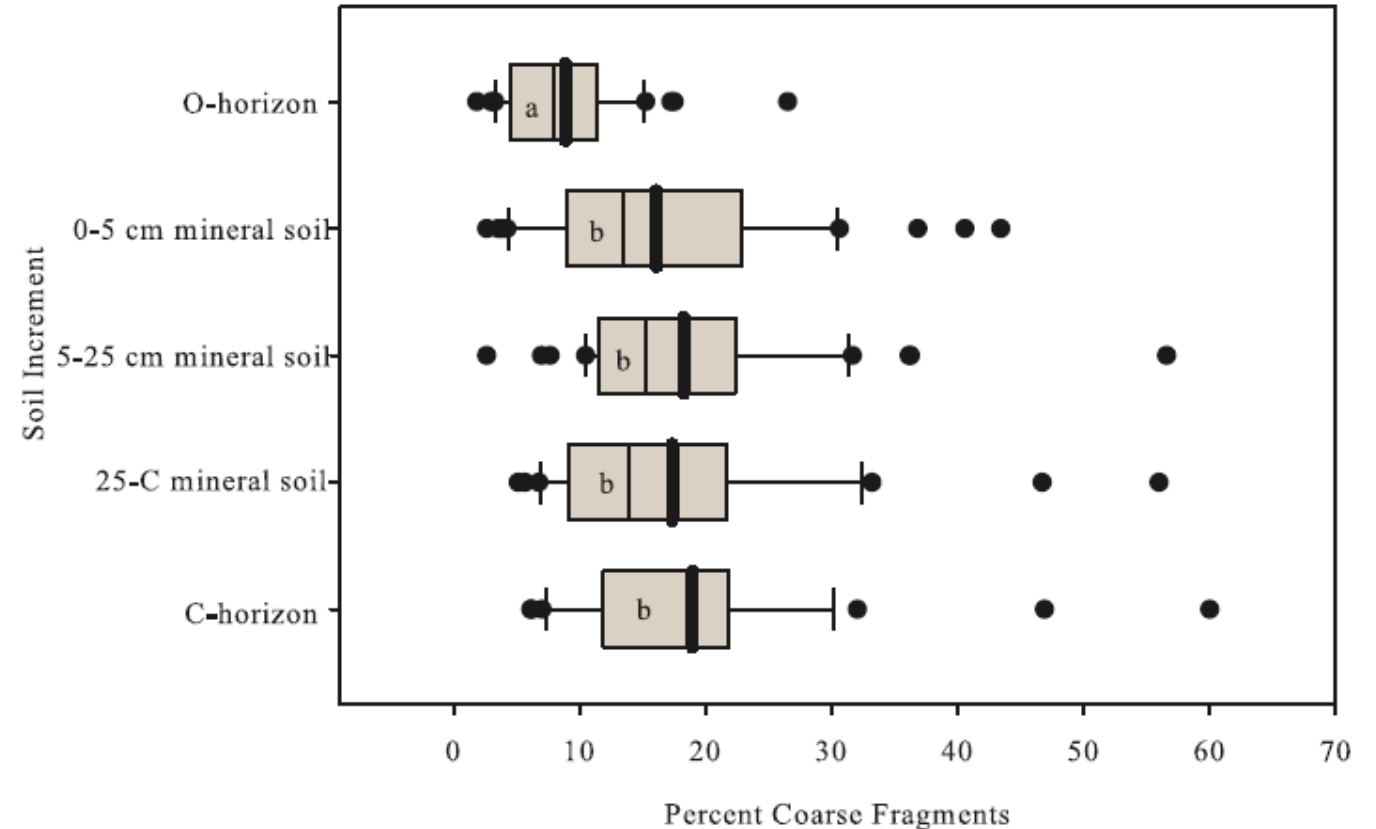


After Lal FEM 2005



6. YOU KNOW IT'S A FOREST SOIL WHEN...

- “rocks” is not adolescent enthusiasm but an essential part of the soil architecture.



SanClements et al. (2010)



6. THE TIMES THEY ARE A CHANGIN'...

- ↑ wetter
- ↑ intense storms
- ↑ warmer
- ↑ mud season
- ↑ Ca, ↓ N
- ↑ Demand for forest ecosystem services
 - Forest sustainability
 - Carbon sequestration
 - Water quality and yield
 - Clean air
 - Wildlife habitat
 - Recreation



A photograph of a forest floor covered in fallen brown leaves. The text "THANK YOU" is overlaid in white, bold, sans-serif font in the center of the image. The background shows several tree trunks and a dense canopy of green leaves, with sunlight filtering through the trees.

THANK YOU