ABCs of Forest Soils

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New England Region Council on Forest Engineering Workshop
March 13, 2018
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.
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.
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.

After McBratney et al. Geoderma 2014
3. SOIL HORIZONS (LITERALLY ABC!)

- Zone of eluviation
- Zone of illuviation
- Parent material

Images: University of Idaho and nesoil.com/images/hinesburg
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

<table>
<thead>
<tr>
<th>MOR order</th>
<th>MODER order</th>
<th>MULL order</th>
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<tbody>
<tr>
<td>Group</td>
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<tr>
<td>Hemimor</td>
<td>Mormoder</td>
<td>Vermimull</td>
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<tr>
<td>Hemimor</td>
<td>Leptomoder</td>
<td>Rhizomull</td>
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<tr>
<td>Resimor</td>
<td>Leptomoder</td>
<td>Hydromull (wet)</td>
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<td>Lignomor</td>
<td>Lignomerd</td>
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<td>Hydromor (wet)</td>
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<td>Fibrilimor (wet)</td>
<td>Saprilmord (wet)</td>
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<td>Mesimor (wet)</td>
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“Pit and Mound” is not a new breed of dog!
worms are bad, snow is good!
- it has more carbon than the trees!
“rocks” is not adolescent enthusiasm but an essential part of the soil architecture.
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
THANK YOU