Montmorency Conservation District
Article from MSU

SOILS

Soils are formed through a very complex process involving the nature of the parent bedrock, climate, animals, vegetation, slope of the landform, and length of time the soil has been in existence. Most of Michigan's soils were developed from glacial sediments deposited during the Ice Age. As the huge ice sheets moved southward over Michigan, they picked up, eroded, and deposited rocks, sand, gravel, and silt. When the ice receded the material collected in and underneath the ice sheets was left behind. Since then the surface layers have been changed by the action of water, ice, wind, plants, animals, and people. Thus, there are a great variety of soils, and in Michigan, soil characteristics may differ dramatically from region to region, from field to field, or even within a single field.

Soils are characterized by the differences in the various layers (horizons). In natural settings, the mineral soil is overlain by the O (organic) soil horizon, which is made up of decaying leaves, twigs, etc. (see below).

The topmost mineral horizon is called the A horizon and contains the partially decomposed vegetable matter called humus, which helps to hold moisture and provide food for plants to grow. In forest soils, the dark A horizon is underlain by a light-colored E horizon, from which various amounts of clay, Fe and Al have been removed by infiltrating water. The B horizon (below the E and A) is the zone that accumulates these compounds. It is often brown in color.

To read more about this article, please visit our website on www.Montmorencycd.org.

Please join us as our Soil Scientist; Tom Williams discusses various S**oil types and mapping**.
When: Thursday, May 29th, 2014
Time: 6:30 p.m. – 7:30 p.m.
Where: The Montmorency Conservation District (located at the Fairgrounds)

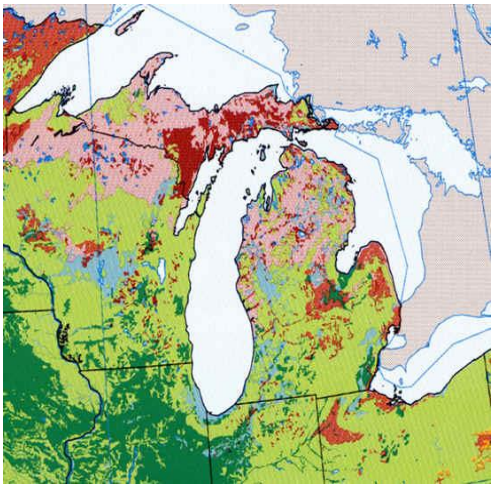
Admission is Free

Seating is limited so please contact Cathy or Aprille to reserve your spot.
(989) 785-4083

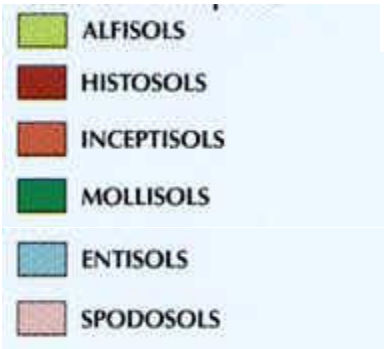
The soils of Michigan vary greatly. Sandy soils are dominant in the western and northern portions of the Lower Peninsula; clays and loams, in the southern Lower Peninsula. The size of particles, or texture, varies in different kinds of soil. Soils with a loam texture have a combination of soil particle sizes; there are sandy loams, silty loams, loamy sand, and clay loams.

Loam soils are best for plant growth because sand, silt, and clay together provide desirable characteristics. First, the different-sized particles leave spaces in the soil for air and water to flow and roots to penetrate. The roots feed on the minerals in the suspended water. Deep sands do not hold moisture well and are often infertile. Clays hold moisture better than sands and may be more fertile, but they tend to swell when they get wet, which may limit the movement of water and roots. Clays crack when they dry and the clods become very hard and difficult to manage (for humans as well as plants!). A desirable soil is a loam with enough sand to drain well yet with enough clay and silt to hold to hold moisture. Silt-sized grains also contain nutrients and help make a soil workable.

Some soils (Histosols) contain a large amount of partially decayed vegetation (humus) and are called peat or muck. They are often used for growing vegetables because of their high fertility. Thus, the distribution of various kinds of soils in Michigan relates closely to the various types of crops grown and how productive the agriculture is.



Soil maps can be created, and the soils of a region examined, along a number of different scales and with differing degrees of accuracy and complexity. The map below shows the soils of the western Great Lakes region at a very general level, in fact at the broadest and most generalized level: soil orders (of which there are only 12 in the world). The six major soil orders in Michigan each have their own web page (use the "back" key to get to the list).

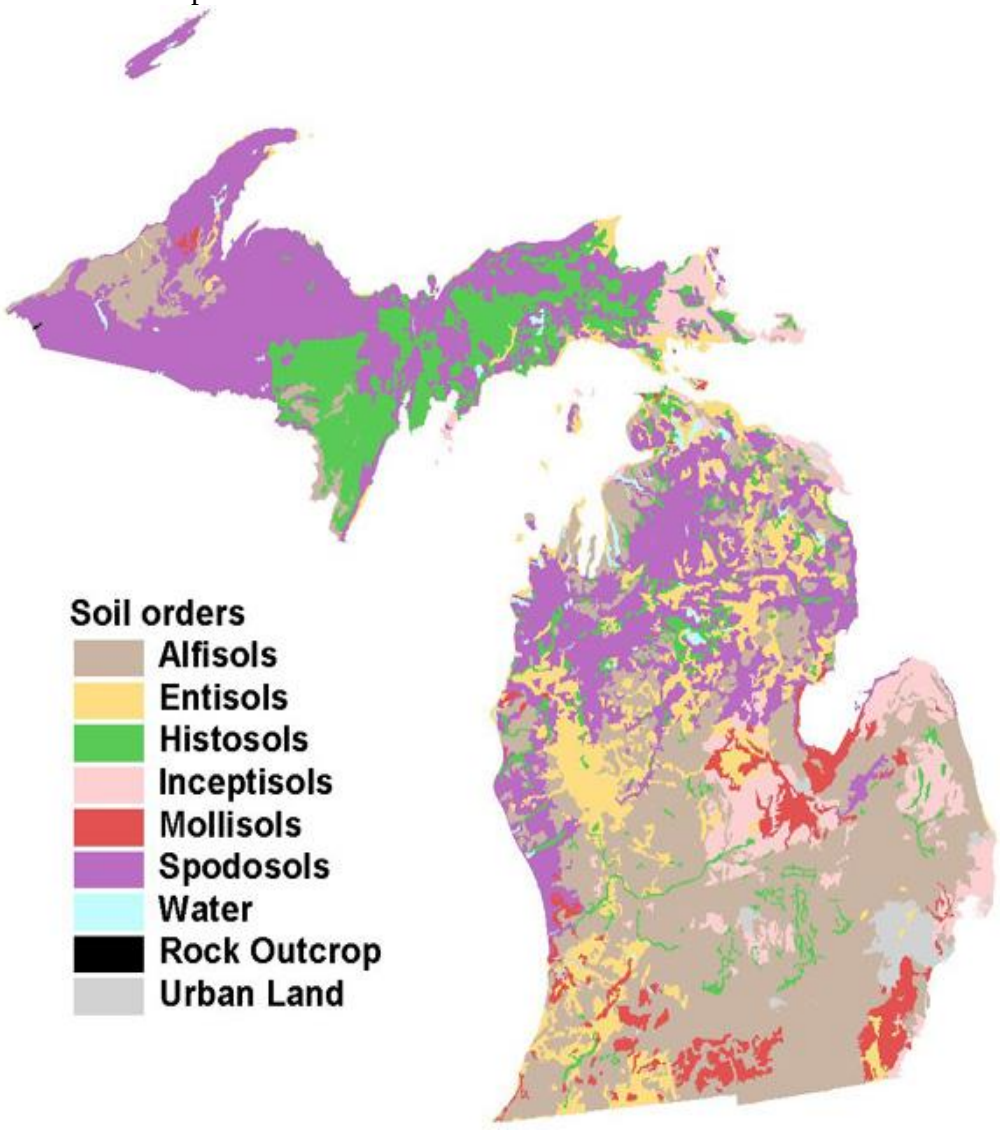


The soil information used for the three soil maps below, in this section of the GEO 333 web page, was Natural

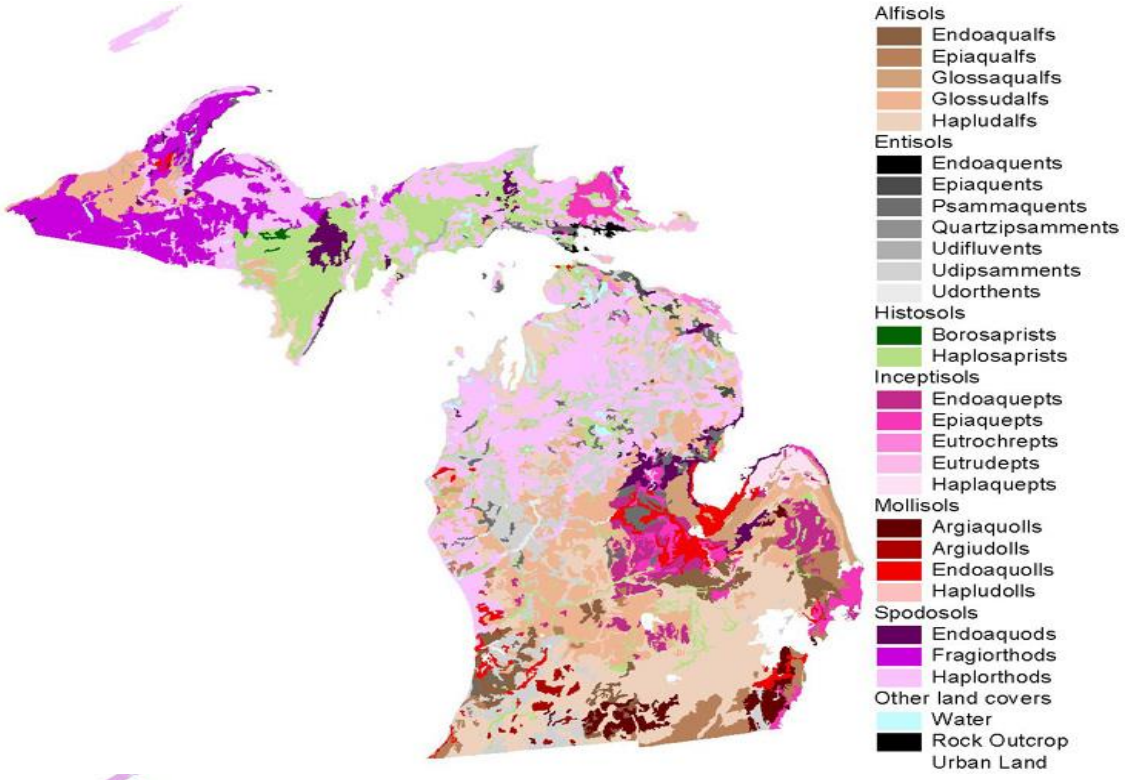
Resource Conservation Service 1994 STATSGO data. STATSGO was compiled at 1:250,000 and designed to be used primarily for regional, multistate, State, and river basin resource planning, management and monitoring.

(Web source: http://www.ftw.nrcs.usda.gov/stat_data.html; Metadata: http://www.ftw.nrcs.usda.gov/metadata/mi.html)

A more accurate map of the major soil orders in Michigan is shown below. Note how Spodosols dominate the UP and northern lower peninsula, except of clayey landscapes (here you'd find Alfisols) and the wettest swamps (here you'd find Histosols), and how Alfisols dominate the southern lower peninsula.

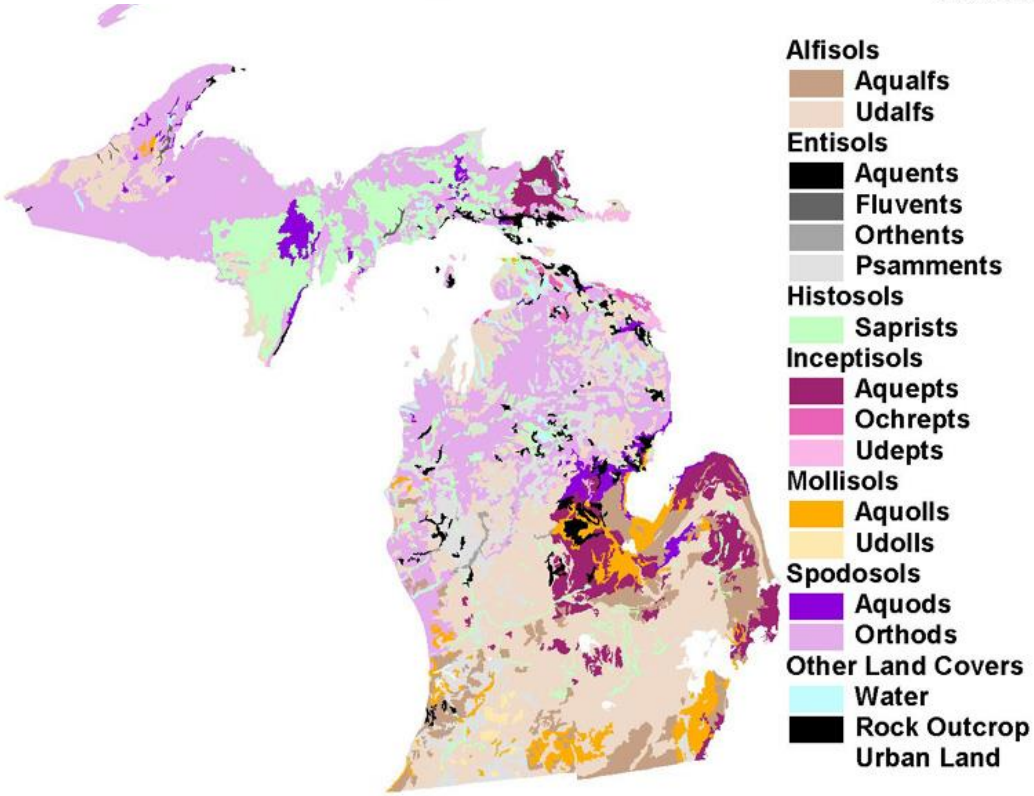


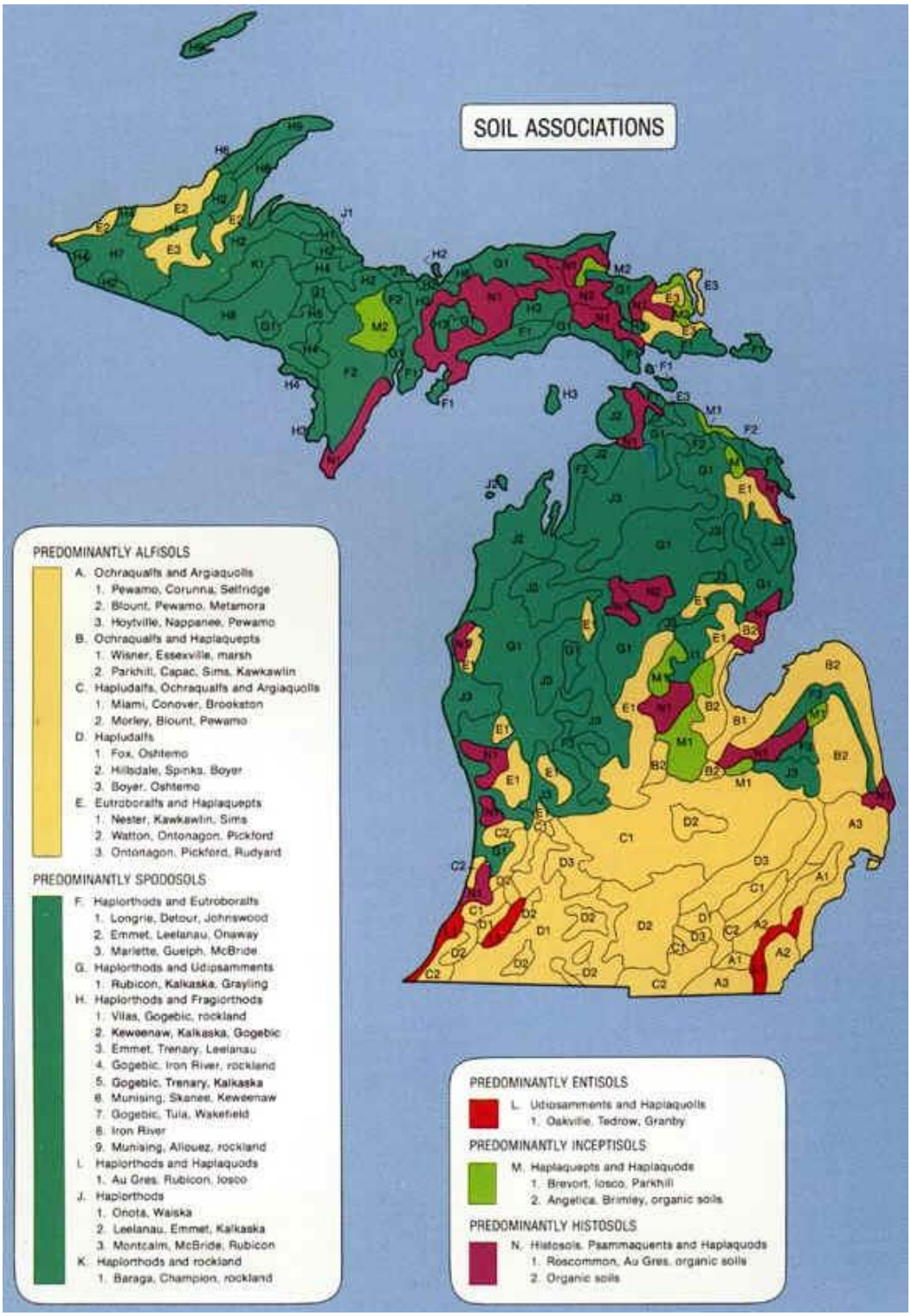
The two maps below show even more detail, breaking the soil orders down into suborders and then Great Groups.



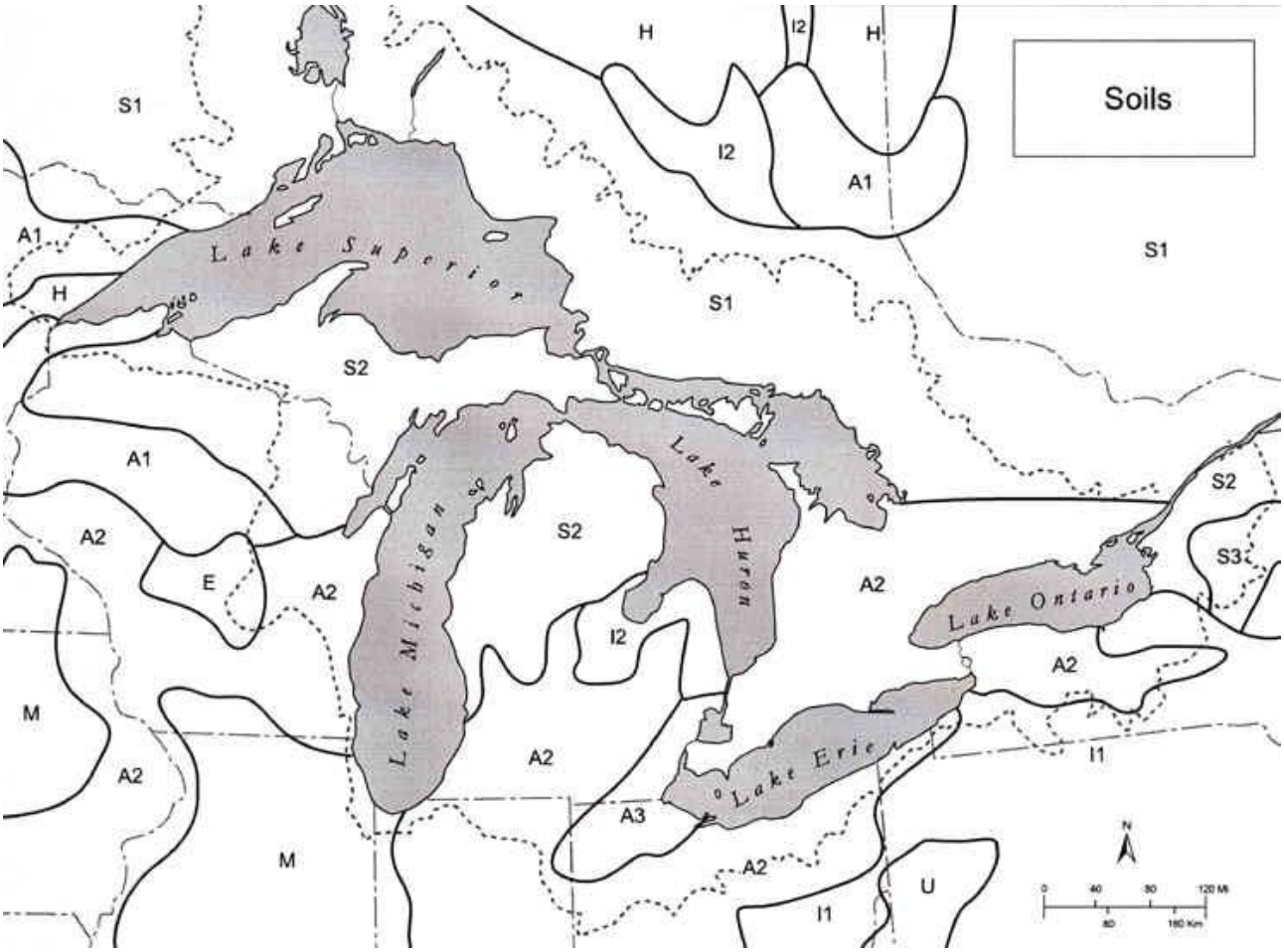
Another way to look at soils is by their major *associations*.

A soil association represents several types of soil that commonly are found together.





But what about soils in neighboring areas and states? The map below provides some information along these lines.



KEY:
S: Spodosols
E: Entisols
M: Mollisols
A: Alfisols
U: Ultisols
H: Histosols

Parts of the text on this page have been modified from L.M. Sommers' book entitled, "Michigan: A Geography".