**GLACIAL FEATURES OF MICHIGAN**

Geologic maps indicate different surface materials using different colors. This particular geologic map is of the glacial deposits that cover the Lower Peninsula. There are three colors that dominate the map, blue, green, and pink. The blue are lake deposits (lacustrine). The green are deposits of glacial till. The pink (and purple) are glacial stream deposits (outwash). It is important to remember that this map is of the surficial deposits – the uppermost sediment at the top of the land surface. The color depicts what type of deposit was laid down last. This map does not show the vertical sequence of sediments. A glacial advance would produce a layer of till, but as the glacier retreated this till may have been buried by outwash deposits or flooded by high lake levels

# GLACIAL TILLS - The green colors represent tills deposited by the major lobes of glacial ice. There were three major lobes of ice covering the state. One lobe extended down the Lake Erie basin, one lobe down the Saginaw Bay area, and one lobe in the Lake Michigan basin. The shape of the end moraines outlines the various positions of these lobes as they retreated across the state. The topography of these areas varies from the gentle rolling hills of ground moraine to very steep high hills of end moraines.

1. What topographic feature do the darker shades of green colors indicate?

2. The textural characteristics of till have a significant impact upon their use for farming. The best tills for farming are loamy tills which have a mixture of sand, silt and clay. The % clay impacts water movement and retention. Too much clay and soils will not drain well. Soils with too much sand and too little silt or clay will not retain moisture well. Also, tills with too much coarse material require extra effort to clear the fields of large stones.

Describe the basic texture of the till found in the following areas (fine-grained, medium-grained, or coarse-grained).

A - south-central (Ingham county, Lansing area)

B - north-central (Osceola county, Cadillac area)

C - north-east (Presque Isle county, NW of Alpena)

D - west (N. Allegan county, just SE of Holland)

Based upon this information which area of tills is probably the best farmland?

**LAKE DEPOSITS – Blue**

The areas covered by blue on the map tend to be relatively flat. When the lakes were present in these areas the wave action spread sediment out and tended to fill in the low areas in the topography resulting in the level topography we see today.

3. What is the difference between sediment found in the light blue areas and the dark blue areas?

4. Which blue color is dominant in the SE Michigan?

Which blue color is dominant along the west coast of Michigan?

Based on the lake sediment type, where would we expect better infiltration of water during a rain, in Allendale or in Detroit?

5. What kind of deposit does the yellow color (commonly found along the west and east coast of Michigan) represent?

# GLACIAL OUTWASH – pink

The pink (and purple) areas are covered with deposits from meltwater streams coming off the glaciers. These stream systems deposited sediment across broad areas and generally the topography of these areas is relatively flat.

6. Describe the types of sediments you would expect to find in the areas covered with glacial outwash (see explanation). Why do these sediments contain little or no clay?

7. Find Saginaw Bay on the east side of Michigan. As the ice of the Saginaw Bay lobe was retreating eastward, a large lake developed in the area east of Saginaw Bay (as shown by the blue shading). This lake formed between the retreating ice to the east and the end moraines produced by the ice sheet to the west. This large lake drained through openings in the moraines across the State and emptied into Lake Michigan.

What two current rivers occupy the former drainage channel that connected the Saginaw Bay and Lake Michigan? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hints: The current river valleys are pink in color. For the first river (which discharges into the second one), look for a break in the end moraine at the southeast edge of the large lake (as outlined in blue). The first river (whose names rhymes with "staple") discharges into the second one (and the 2nd one runs through Grand Rapids)

**Other**

8. According to the glacial geology map, what kind of sediment is under your local landfill?

Does this seem like a good location for a landfill based on the Quaternary geology?

9. Find the drumlins nearest to your school. Where are they?

What direction was the ice flowing?