

GEOMORPHIC PROCESSES

15-040-504

Laboratory #4: Soils of the Cincinnati Area

Purpose:

1. Familiarization with the soils of the area
2. Testing the usefulness of the PE & TE climatic indices in predicting soil type.
3. Familiarization with the U.S.D.A. 7th Approximation and the Zonal soil classification schemes

Readings:

Ollier, C.D. 1975. *Weathering*. p. 141-147.

U.S. Department of Agriculture. 1982. *Soil Survey of Hamilton County, Ohio*, p. 1-5, 117-119, 123-130.

References:

Olson, G.W. 1976. Criteria for making and interpreting a soil profile: Kansas Geological Survey Bulletin 212.

U.S.D.A., 1975. *Soil Taxonomy*. Agricultural Handbook 436.

Procedure:

1. Calculate PE using the equation given in the soils handout. Use Table 1 (p. 132) of the Hamilton County Soil Survey for the climatic data. Assume that the monthly mean temperature (T_i) is equal to the average of the "average daily maximum" and the "average daily minimum" given in the first two columns of Table 1. Read P_i from the seventh column of Table 1.
2. Locate your position on Diagrams A, B, and C in the soils handout using the values of PE and TE calculated in the Step #1.
3. Carefully read Ollier's (1975) description of the zonal soil corresponding to that determined from Diagram C of the soils handout in step #2.
4. Select a soil in Hamilton County that you believe has had time to come into equilibrium with the local climate. Carefully read the description of the soil given in the soil survey. Find what order this soil corresponds to in the U.S.D.A. 7th Approximation Classification that is given in Table 19, p. 219 in the soil survey.
5. Read the description and definition of the soil order you found in Step 4 that is given in Agricultural Handbook 436 (do not read the description of suborders, groups, etc.).

Analysis and Question:

1. Discuss the criteria you used in selecting the soil you think might be closest to equilibrium with the climatic conditions in Hamilton County.
2. How well did the soil description given by Ollier for the zonal soil calculated from Diagram C using the PE and TE indices correspond with the description of the equilibrium soil you selected in Hamilton County? Discuss.
3. Use the table in the soils handout to find what zonal soil group (under the heading "Approximate old great soil group") is equivalent to the U.S.D.A. soil order of the Hamilton County soil you selected. Does this correspond to the predicted zonal soil calculated from Diagram C?