

## Soils

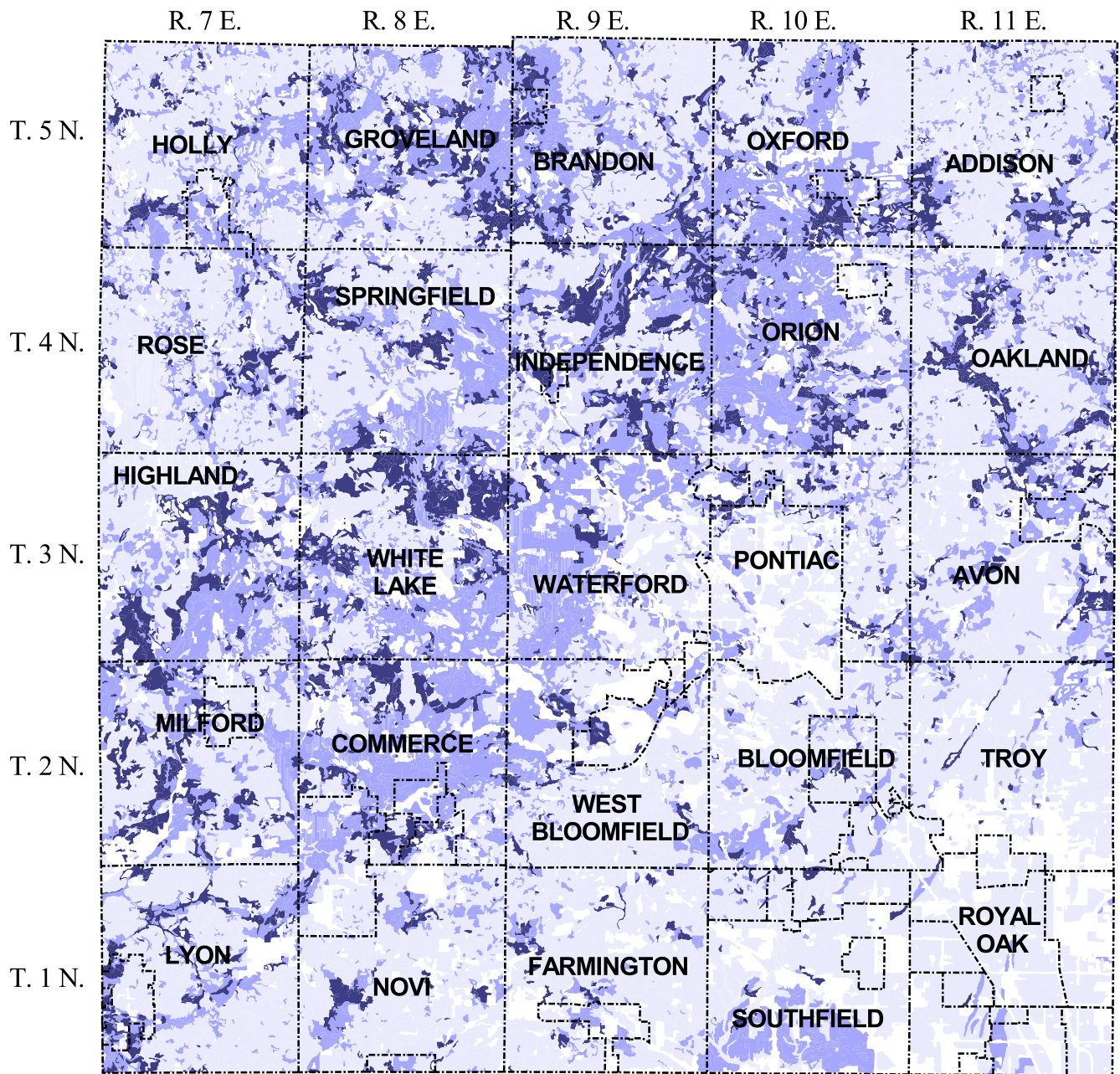
The soils of Oakland County are the direct result of the surficial geologic processes previously described. Physical and chemical characteristics reported by the Soil Conservation Service (1982) show patterns similar to the surficial geology map shown previously.

Minimum soil permeability, for example, ranges over two orders of magnitude, from 0.06 inches/hour (in/hr) to 20 in/hr. The region with minimum infiltration rates of 6 in/hr or greater closely resembles the region mapped as outwash (fig. 5). Infiltration rates directly affect the amount of recharge, and thus the potential for transport of contaminants into an aquifer. The lowest permeability soils correspond spatially to till and lake-bed sediments. High permeability, sandy soils have been widely identified as being susceptible to contamination by anthropogenic pollutants, such as nitrate (Kittleson, 1987; Fetter, 1994).

The chemical properties of the soils also reflect the surficial geologic processes. The highest concentrations of calcium carbonate in the soil are generally clustered in regions formed of till. Calcium carbonate concentrations are generally lower in the outwash plain region located in the central part of the county. Bicarbonate ( $\text{HCO}_3^-$ ), an ion formed when calcium carbonate is dissolved by infiltrating water, has been shown to encourage the dissolution of arsenic (Kim, 1999).



*The top several feet of soil contain different layers called horizons. The permeability of these horizons controls how quickly water and potential contaminants are transported into aquifers. (Photo courtesy of R.J. Schaetzl.)*



Sources:  
Soils information provided by Soil Conservation Service (1982).

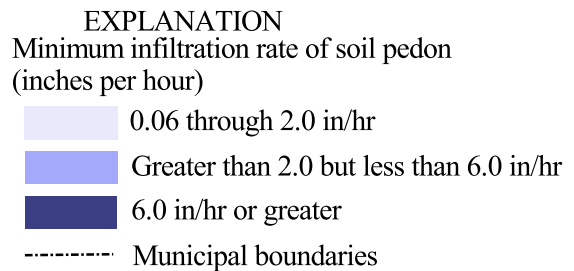
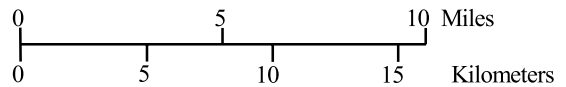


Figure 5. Minimum soil permeability rates in Oakland County, Michigan.