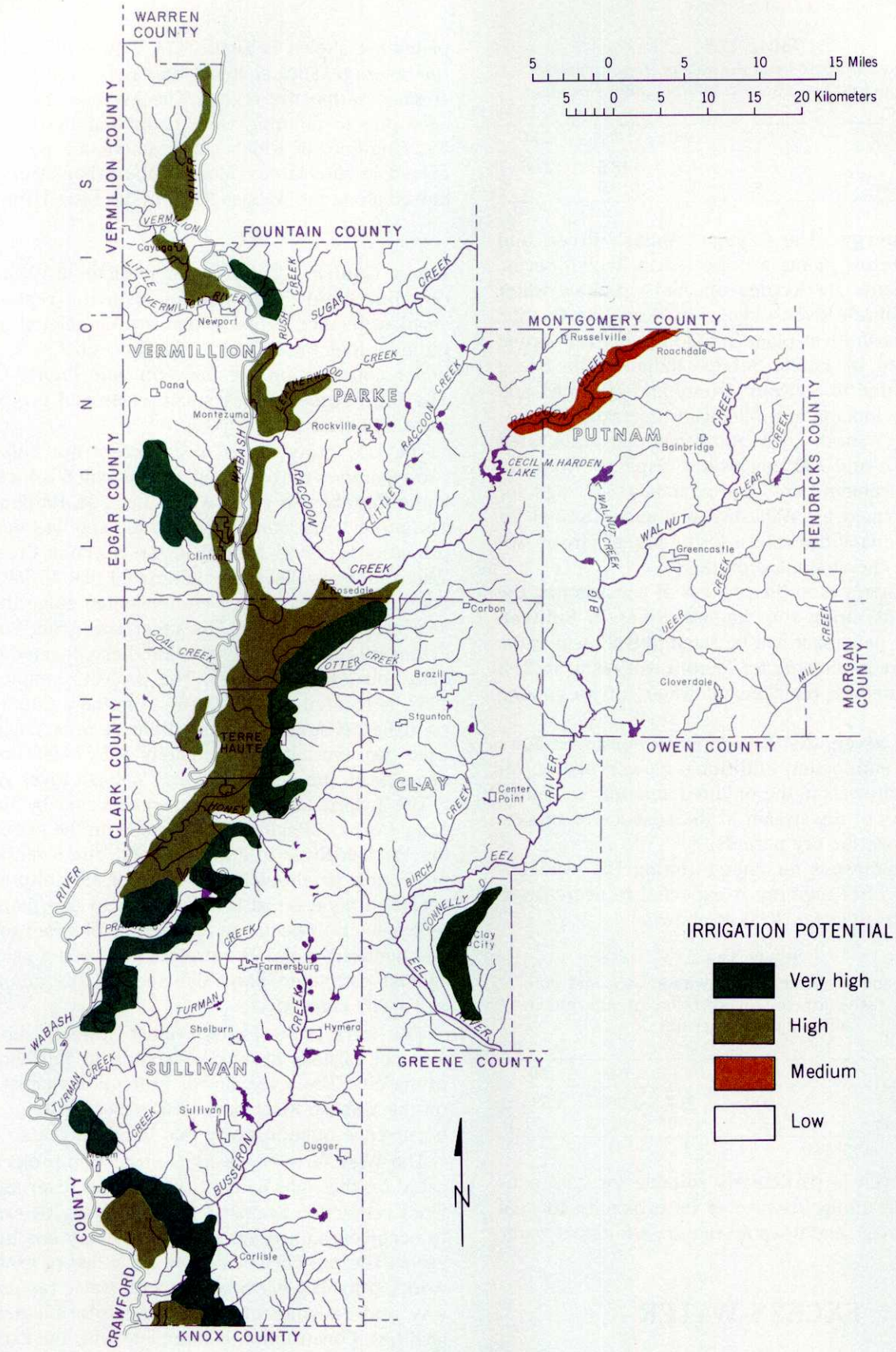

Figure 153
Map of Region Seven showing the general location of the soil associations that appear to possess an economic potential for the irrigation of croplands.

Table 123
The current and projected withdrawals of irrigation water for croplands and golf courses, in million-gallons-per-day.

Irrigation	*1977*	*1980*	*1990*	*2000*
Withdrawal	6.8	9.5	18.5	27.6
Consumption	6.8	9.5	18.5	27.6

Electric Energy The Cayuga, Wabash River, and Breed generating plants are located in Region Seven. All three plants are located on, and withdraw water from, the Wabash River. Cayuga, in Vermillion County, and the Wabash River plant in Vigo County are owned and operated by Public Service Indiana. The Breed plant is located in Sullivan County and is owned and operated by Indiana and Michigan Electric Company. The Cayuga, Wabash River, and Breed plants are rated at 1,075, 937, and 420 megawatts respectively. Water intake requirements are approximately 852 mgd for Cayuga, 747 mgd for Wabash River, and 318 mgd for Breed. These facilities return to the parent stream approximately the amount withdrawn.

Hoosier Energy is in the process of constructing the Merom Plant along the Wabash River in Sullivan County. The new plant will be rated at 980 megawatts. The intake requirements for Merom will result in 21.3 mgd consumed as replacement water for its cooling pond.

In Region Seven, the Wabash River possesses flows capable of supporting additional power plants, although withdrawals in the required amounts will affect the low flows of the stream in the absence of supplemental storage for dry periods.

Water withdrawals for energy during 1977 was approximately 1,917 mgd but is expected to decrease to 1,586 mgd by the year 2000 as shown.

Table 124
The 1977 and projected water withdrawals and consumption rates for the production of energy, in million-gallons-per-day.

Energy	*1977*	*1980*	*1990*	*2000*
Withdrawal	1,917	1,917	1,960	1,586
Consumption	0	0	21.3	21.3

Region Seven is particularly suitable for coal conversion plant siting because of its proximity to coal producing areas, and it would require additional water withdrawals.

EXCESS WATER

Flooding

It is estimated that approximately 138,000 acres of Region Seven are subject to flooding. The major flood plains are shown in Figure 154. Figure 155 delineates the average annual flood damages along selected streams within the region. The average annual damages due to flooding were estimated in 1977 to be $5.28 million, of which some ninety-one percent occurred in rural areas. Most of the urban damage occurred along the Wabash River in the Terre Haute area.

Flood Control There are a number of existing or on-going flood control projects in the region. The small watershed projects that are completed include Little Walnut Creek and Little Raccoon Creek. Those under construction are Busseron and Prairie Creeks. The Big Raccoon Creek small watershed project has been authorized.

The U.S. Army Corps of Engineers has completed two reservoirs in the region, one of which is located in Parke County and is known as Cecil M. Harden Lake. The project was completed in 1960 and was designed primarily for flood control in the Raccoon Creek and Wabash River valleys. It is estimated that $5,380,000 in flood damages has been circumvented since the lake has been in operation. The other U.S. Army Corps of Engineers reservoir is Cagles Mill Lake, located in Putnam and Owen Counties. The project, completed in 1952, is located on Mill Creek in Putnam County, and controls 295 square miles of drainage area. Cagles Mill Lake has averted approximately $20,314,000 in flood damages in the Eel, White, and Wabash River valleys.

The Lyford Levee Project, constructed by the U.S. Army Corps of Engineers, is located on the left bank of the Wabash River in Parke County. The levee affords protection to about 3,500 acres of agricultural land against a flood equal in magnitude to one that could be expected to occur on an average of seven times in one hundred years. The project has been a safeguard against estimated flood damages in the amount of $1,390,000 since 1943.

The Terre Haute Levee Project protects about 110 acres of partially developed land at the northern edge of the city. The levee affords protection against floods on the Wabash River having an expected frequency of occurrence once in every one hundred years.

The West Terre Haute local protection project is located on the right bank of the Wabash River and provides protection against a flood that may be expected to occur on an average of once in every one hundred years. The project consists of 2.8 miles of protection works, primarily earth levees, with traffic ramps, highway and railroad closures, and internal drainage facilities. Construction is complete with the exception of a section of levee. It is estimated that the project has prevented flood damages totaling $14,000 since construction started in 1970.

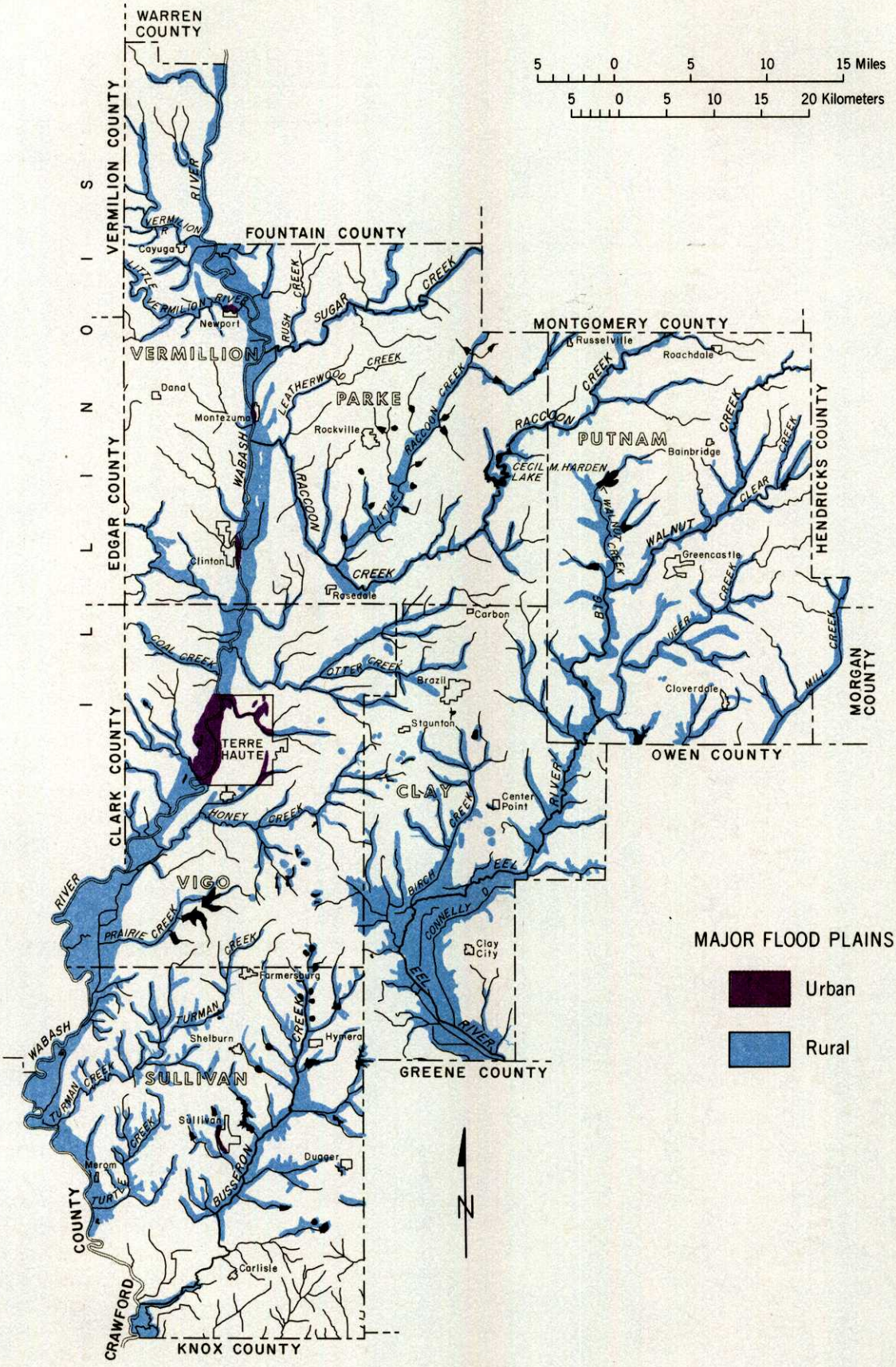

Figure 154
Map of Region Seven showing the major floodplains.

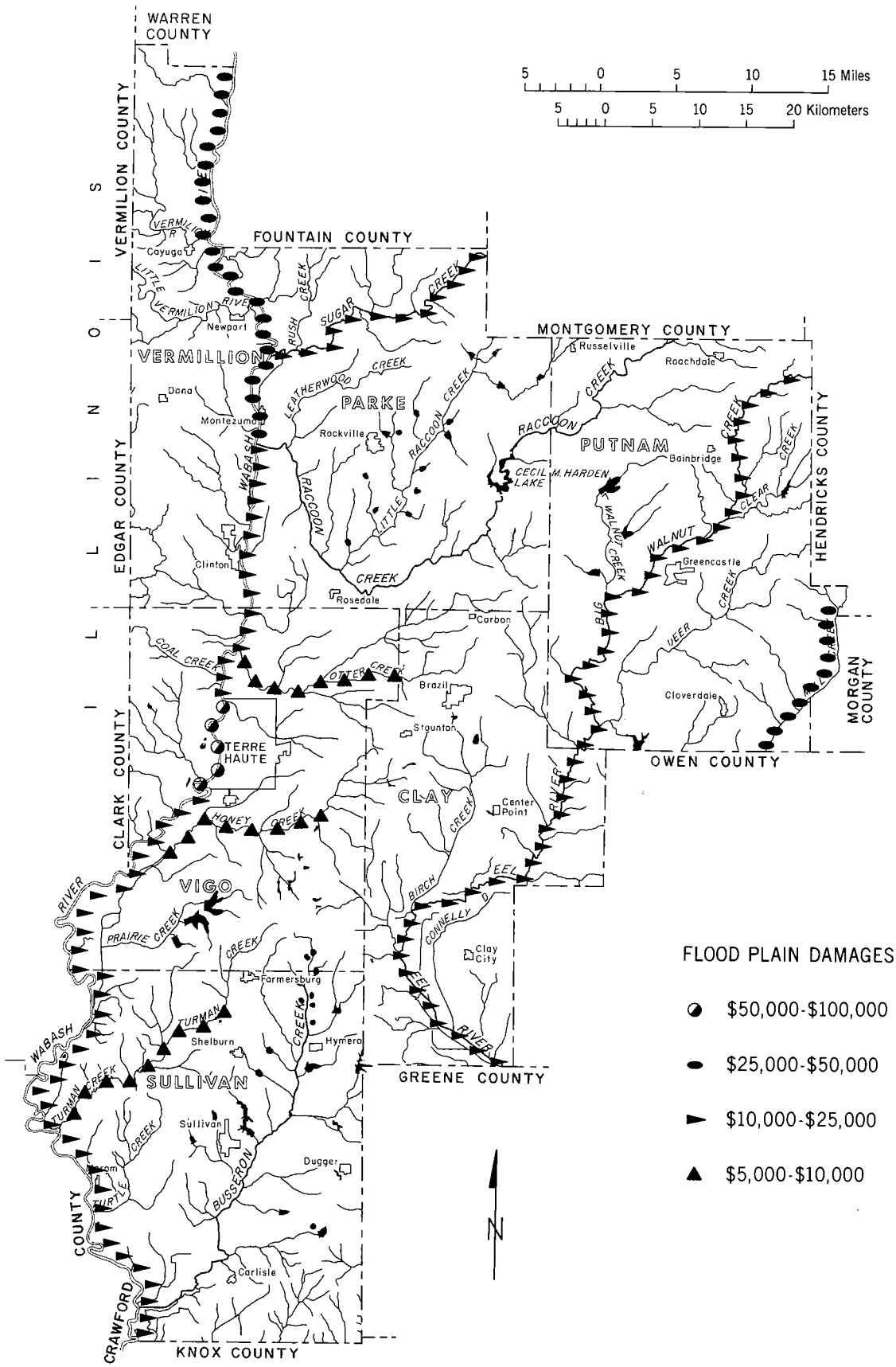

Figure 155
Map of Region Seven showing the estimated average annual flood damages per mile along selected streams.

The U.S. Army Corps of Engineers has completed two agricultural protection projects. The Gill Township project, located on the left bank of the Wabash River in Sullivan County, consists of a system of earth levees with pumps designed to dispose of drainage from the protected area during flood periods. This project protects 12,000 acres and the small community of Riverton. It is estimated that the project has averted flood damages amounting to approximately $8,000,000 since 1941.

The Niblack Levee, located in Knox and Sullivan Counties along the left bank of the Wabash River, consists of eighteen miles of earth levees. Pumping facilities were installed in 1976. The Niblack Levee protects about 15,900 acres of agricultural land against floods equal in magnitude to a flood that can be expected to occur on an average of seven times in every one hundred years. An estimated $2,585,000 in flood damages was prevented since the completion of the levee in 1965.

The Greenfield Bayou Levee and the Island Levee are both locally-constructed agricultural projects within Region Seven.

Flood Plain Management Participants in the emergency phase of the National Flood Insurance Program include Montezuma in Parke County; Bainbridge, Cloverdale, Greencastle, and Roachdale in Putnam County; Clinton in Vermillion County; and Terre Haute and unincorporated areas in Vigo County. Those involved in the regular phase of the National Flood Insurance Program include Dana in Vermillion County and Seelyville in Vigo County.

Agricultural Drainage

Approximately twenty-eight percent of the soil associations have "severe" wetness characteristics, ten percent have "moderate", while sixty-two percent have "slight" wetness characteristics as shown in Figure 156.

Approximately 315 miles of legal drains serve as the main collectors and outlets for on-farm drainage systems. The maintenance of this system, vital to its effectiveness, is the responsibility of the local county drainage boards, or in a limited number of cases, of conservancy districts. No legal entity is responsible for the maintenance of drainage for the other streams and ditches in the region.

Soil Erosion

The erosion potential of soil associations within Region Seven is shown in Figure 157. Forty-five percent of the 1,560,200 acres in the region is classified as having a "high" potential erosion hazard, five percent is classified in the "medium" potential erosion hazard category, while the remaining fifty percent is considered to be in the "low" category for land in a fallow condition. The high and medium potential erosion hazard areas are located throughout the region on the gently sloping land between ridges and streams.

WATER QUALITY

The surface streams within Region Seven routinely surveyed for water quality by the Indiana Board of Health are the Wabash, Vermillion, and Eel Rivers and Sugar, Honey, Big Raccoon, Busseron, and Big Walnut Creeks. Water quality standards for the region are established by the Stream Pollution Control Board regulation SPC IR-4, the Water Quality Standard for the State of Indiana, and SPC 3, dealing with coal mine wastes and drainage.

Samples from the Wabash River indicated that the temperature, dissolved oxygen content, and pH met the required standards of the state. The data showed that the biochemical oxygen demand and the concentrations of nitrate were also at acceptable levels. However the fecal coliform bacteria levels were at times in violation of standards for partial body contact recreation.

Most of the larger streams of the region are relatively pollution free and support good fish populations. Some exceptions are: the Vermillion River, containing effluents from the Danville, Illinois Sewage Treatment Plant and industrial and strip mining waste; Honey Creek in Vigo County having a high biochemical oxygen demand and perhaps carrying industrial pollutants; and Sugar Creek, in Vigo County, showing prevalent acid mine drainage.

Some of the smaller streams located in the region have had dissolved oxygen and pH values which were often far below the required minimums. These low values were probably due to extensive acid mine drainage into these smaller streams.

The Eel River and its tributaries in the eastern portion of the region were relatively pollution free and supported good fish populations. Some high coliform values have been reported in these streams, but these values have fluctuated widely.

A total of six fish kills has been reported in the region in the period from 1974 to 1977. Three were in Clay County near Brazil and resulted from an industrial oil spill into Penniel Creek, a sewer bypass into the city reservoir, and an animal waste discharge into Croys Creek. Of these, the largest resulted in an estimated 1,200 fish killed. Two fish kills have been reported in Putnam County from hog wastes discharged into Mosquito and Mud Creeks. One fish kill was reported in Vigo County near Terre Haute caused by an industrial spill into Jordan Creek.

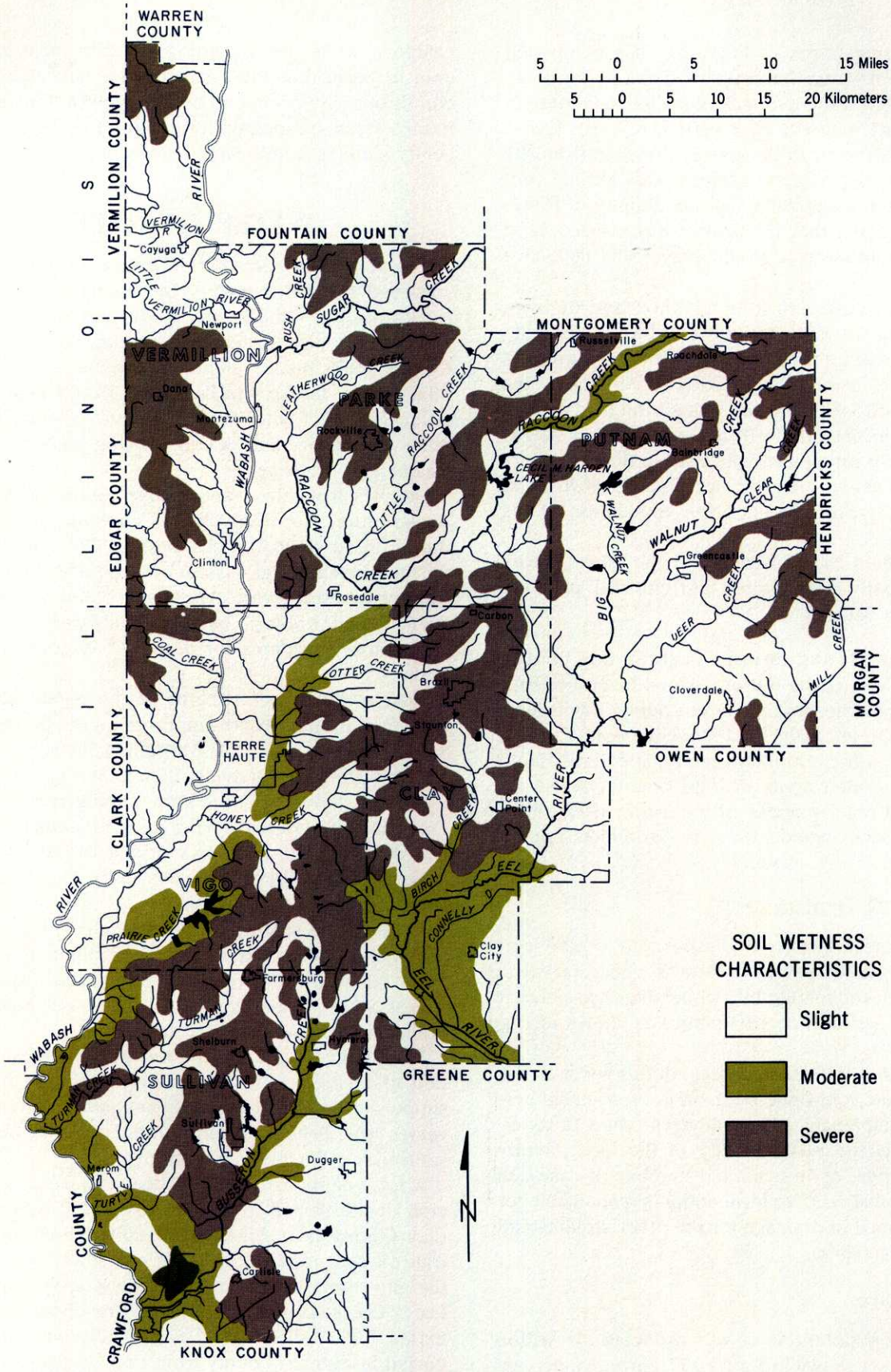

Figure 156
Map of Region Seven showing the general location of the wetness characteristics of soil associations.

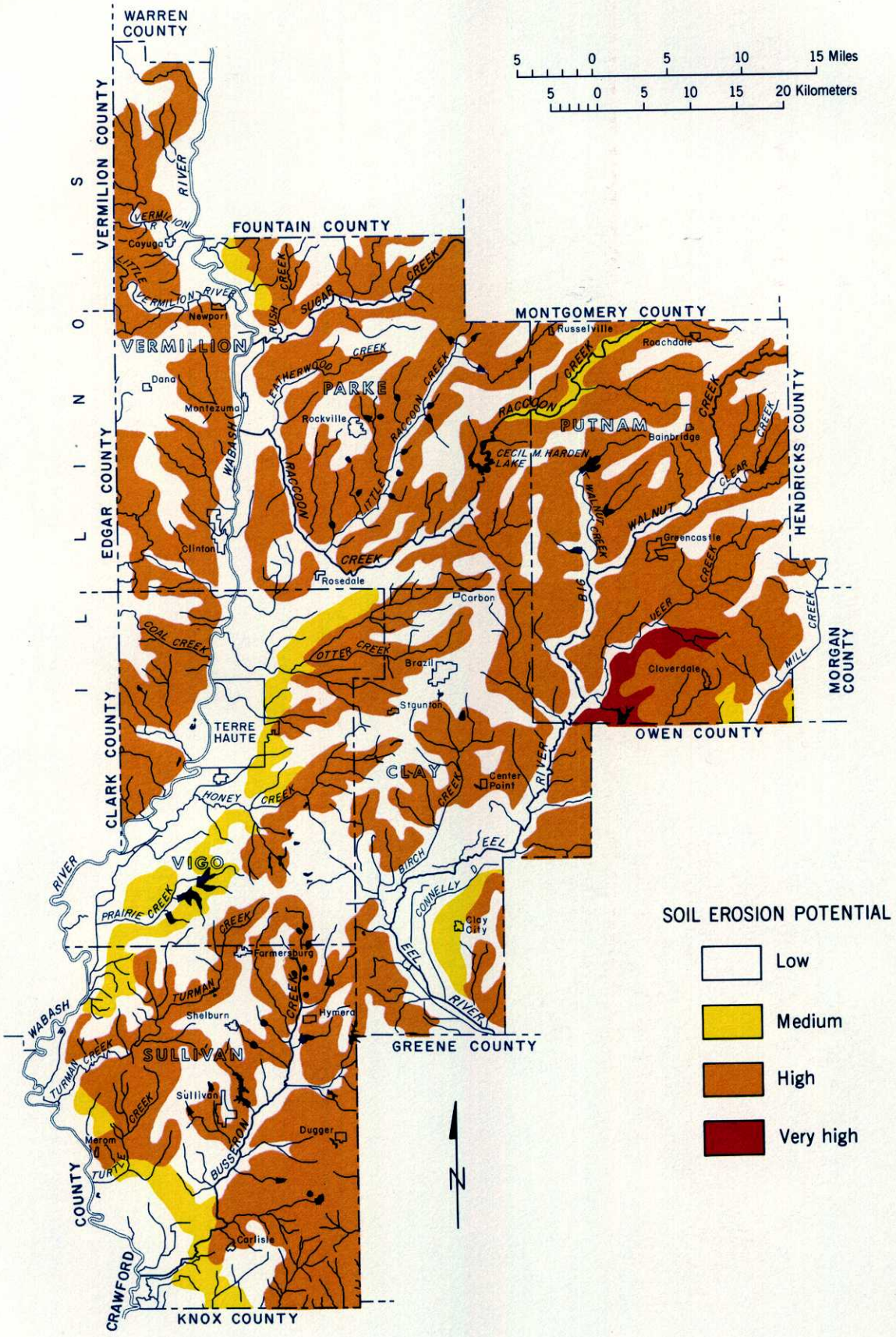

Figure 157
Map of Region Seven showing the erosion potential of the soil associations.