

approximately eighty-two percent of its supply from surface water sources while Howard County depends on surface water for fifty-eight percent of its supply. The remaining water withdrawals are made from ground-water sources. Well fields are normally located within or near the areas being served.

Projections of public water supplies indicate that withdrawals by the public water utilities may increase to approximately 37.2 mgd by the year 2000, as shown below.

**Table 96**

The 1977 and projected withdrawal and consumption rates for public water supplies by the year 2000, in million-gallons-per-day

<i>Public Water Supply</i>	1977	1980	1990	2000
Withdrawal	27.4	28.9	33.3	37.2
Consumption	2.8	2.9	3.3	3.7

**Industrial Water** Industrial establishments had a water intake averaging 34.0 mgd in 1977. Of the total industrial intake, 15.4 mgd was developed by the industries themselves while 18.5 mgd was purchased from the region's public utilities. Most of the self-supplied water is withdrawn from ground-water sources. Approximately 2.5 mgd of the self-supplied industrial water was consumed in 1977.

Although industrial output is expected to increase, total industrial water intake is expected to decrease due to increased plant efficiency. Industrial water use in the region is expected to decrease to 30.7 mgd by the year 2000. The self-supplied component may increase to 15.9 mgd, while the water supplied by public utilities may decrease to 14.8 mgd. Data for industrial self-supplied withdrawals is presented below.

**Table 97**

The 1977 and projected self-supplied withdrawal and consumption rate for industries, in million-gallons-per-day.

<i>Industrial Self-Supply</i>	1977	1980	1990	2000
Withdrawal	15.4	15.1	15.5	15.9
Consumption	2.5	2.6	3.4	4.3

**Rural Self-Supplied Water** The majority of rural self-supplied water is withdrawn from ground-water sources. Residential use of self-supplied water amounted to 6.2 mgd in 1975. Withdrawals of self-supplied water for households may increase to 9.2 mgd by the year 2000.

Livestock accounted for 3.2 mgd of rural self-supplied water. By the year 2000, water withdrawals for livestock may increase to 4.4 mgd.

The total withdrawal of rural self-supplied water may increase from the current 9.7 mgd to approx-

imately 13.7 mgd by the year 2000, as indicated in the following table.

**Table 98**

The 1977 and projected withdrawal and consumption rates for rural self-supplied water, in million-gallons-per-day.

<i>Rural Self-Supply</i>	1977	1980	1990	2000
Withdrawal	9.7	10.2	12.0	13.7
Consumption	9.7	10.2	12.0	13.7

**Irrigation Water** Soil associations with irrigation potential are shown in Figure 129. Approximately 1,560 acres were irrigated in the region in 1977, consisting of 1,200 acres in Fulton County and 360 acres in Cass and Miami Counties.

Assuming 1977 as a normal growing year, agricultural croplands would have required approximately 4.3 mgd during the peak irrigation period of July and August.

It is estimated that about 57,000 acres in the region could be profitably irrigated. Central Fulton County has an estimated 30,000 acres with irrigation potential, Cass County has 15,000 acres, Miami County has 5,000 acres, and Wabash County has 7,000 acres. It is projected that 9,200 acres will be under irrigation by the year 2000. This expansion is expected to increase the peak July–August irrigation demand in an “average” season to about 26.1 mgd. The average season ground-water withdrawals may increase 13.0 mgd by the year 2000. Surface water sources currently supply seventy-seven percent of current irrigation water and may supply fifty percent by the year 2000.

Irrigation of the region's golf courses requires about 1.3 mgd during the peak July–August irrigation period.

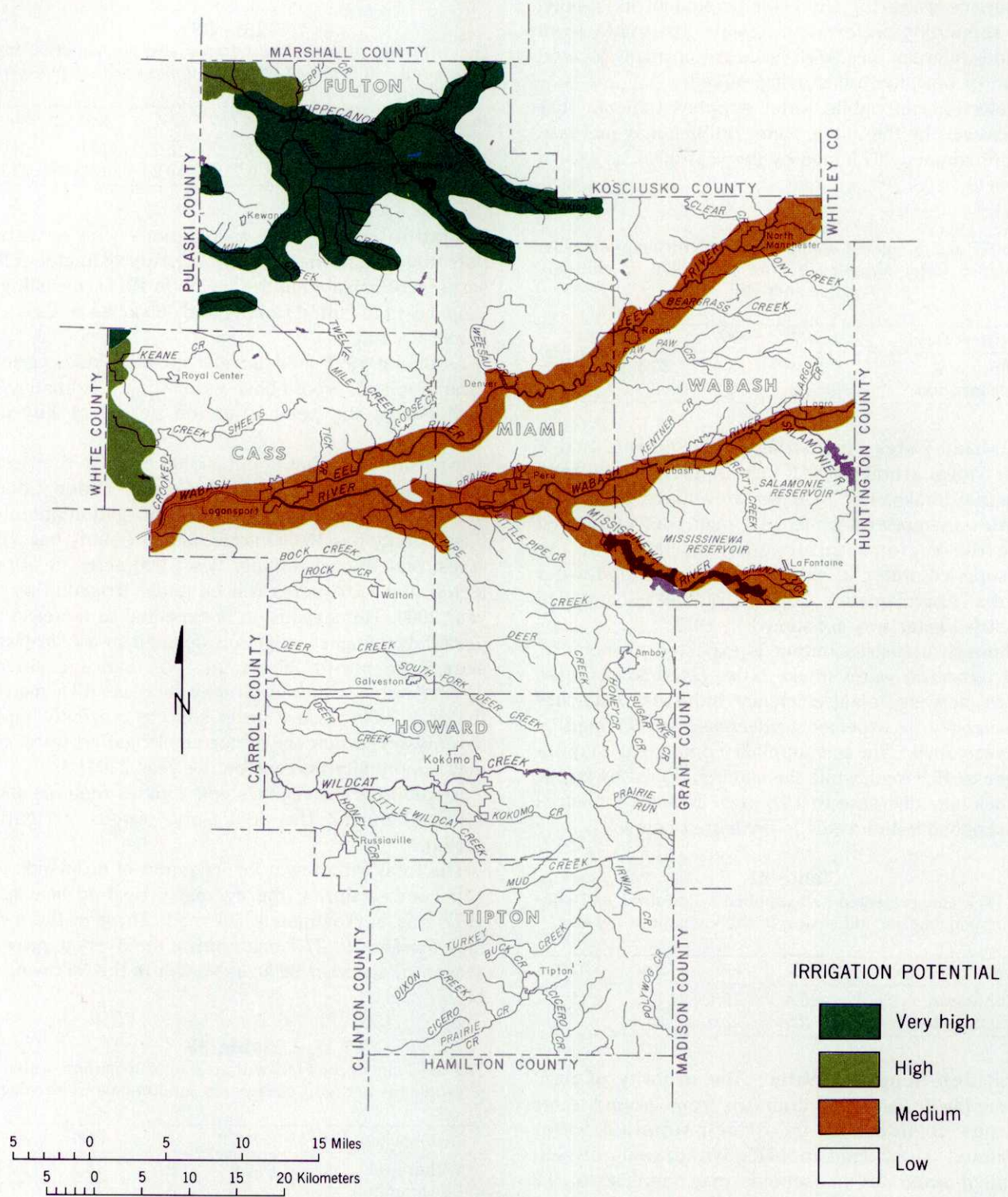
The total withdrawal for irrigation of croplands and golf courses during the average irrigation season of 1977 was approximately 5.6 mgd. These withdrawals may increase to 27.7 mgd during the average growing season by the year 2000, as shown in the following table.

**Table 99**

The 1977 and projected withdrawal of irrigation water for croplands and golf courses, in million-gallons-per-day.

<i>Irrigation</i>	1977	1980	1990	2000
Withdrawal	5.6	8.6	18.1	27.7
Consumption	5.6	8.6	18.1	27.7

**Electric Energy** Two coal-fired, electric generating plants, each having a generating capacity of thirty-eight megawatts, are located in Region Five. The Logansport and Peru facilities each withdraw



**Figure 129**  
 Map of Region Five showing the general location of the soil associations that appear to possess an economic potential for the irrigation of croplands.

approximately 26 mgd from the Eel and Wabash Rivers. All of the water used in the cooling systems of these two plants is returned to the parent stream.

No plans have been announced for any new electrical generating facilities. The Wabash, Tippecanoe, and Eel Rivers possess flows that could support a power plant.

Water withdrawals for the production of energy in 1977 were approximately 58.0 mgd but are expected to decrease to 15.0 mgd by the year 2000, as tabulated below.

**Table 100**

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

<i>Energy</i>	<i>1977</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
Withdrawal	58.0	52.0	45.0	15.0
Consumption	0	0	0	0

## EXCESS WATER

### Flooding

It is estimated that approximately 37,000 acres of the region are subject to flooding. The major flood plains are shown in Figure 130. Figure 131 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 \$277,500 in urban areas and \$465,000 in rural areas. Approximately seventy-two percent of the urban damages occur along the Wabash River.

**Flood Control** As of 1978 a number of flood control projects were completed or were being constructed. The small watershed projects included Mill Creek, which has been completed, and Bachelor Run and Rock Creek, both under construction.

Mississinewa and Salamonie Lakes are the two U.S. Army Corps of Engineers multiple purpose projects in the region. Mississinewa Lake was completed in October 1967. The control structure is located in Miami County about seven miles southeast of Peru. It is estimated that the project has prevented \$13,279,000 in flood damages on the Wabash and Ohio Rivers since its completion. Salamonie Lake is located in Wabash County about ten miles east of the town of Wabash. It was completed in September 1966 and controls the drainage of 533 square miles in the Salamonie River watershed. It is estimated that the project has prevented flood damages in the amount of \$13,068,000 to date.

These reservoirs, along with Huntington Lake farther upstream in Huntington County, have considerable

impact on flooding along the Wabash River. The cities of Logansport and Peru benefit from all three projects while the city of Wabash benefits from the Salamonie and Huntington Lakes.

**Flood Plain Management** The communities participating in the emergency phase of the National Flood Insurance Program are listed below. Residents of these areas can purchase insurance against property losses due to flooding.

**Table 101**

Communities participating in the emergency phase of the National Flood Insurance Program.

Cass County, unincorporated	Miami County, unincorporated
Denver	North Manchester
Galveston	Peru
Fulton County, unincorporated	Roann
Howard County, unincorporated	Rochester
Kokomo	Russiaville
LaFontaine	Tipton
Lagro	Wabash
Logansport	Wabash County, unincorporated
	Walton

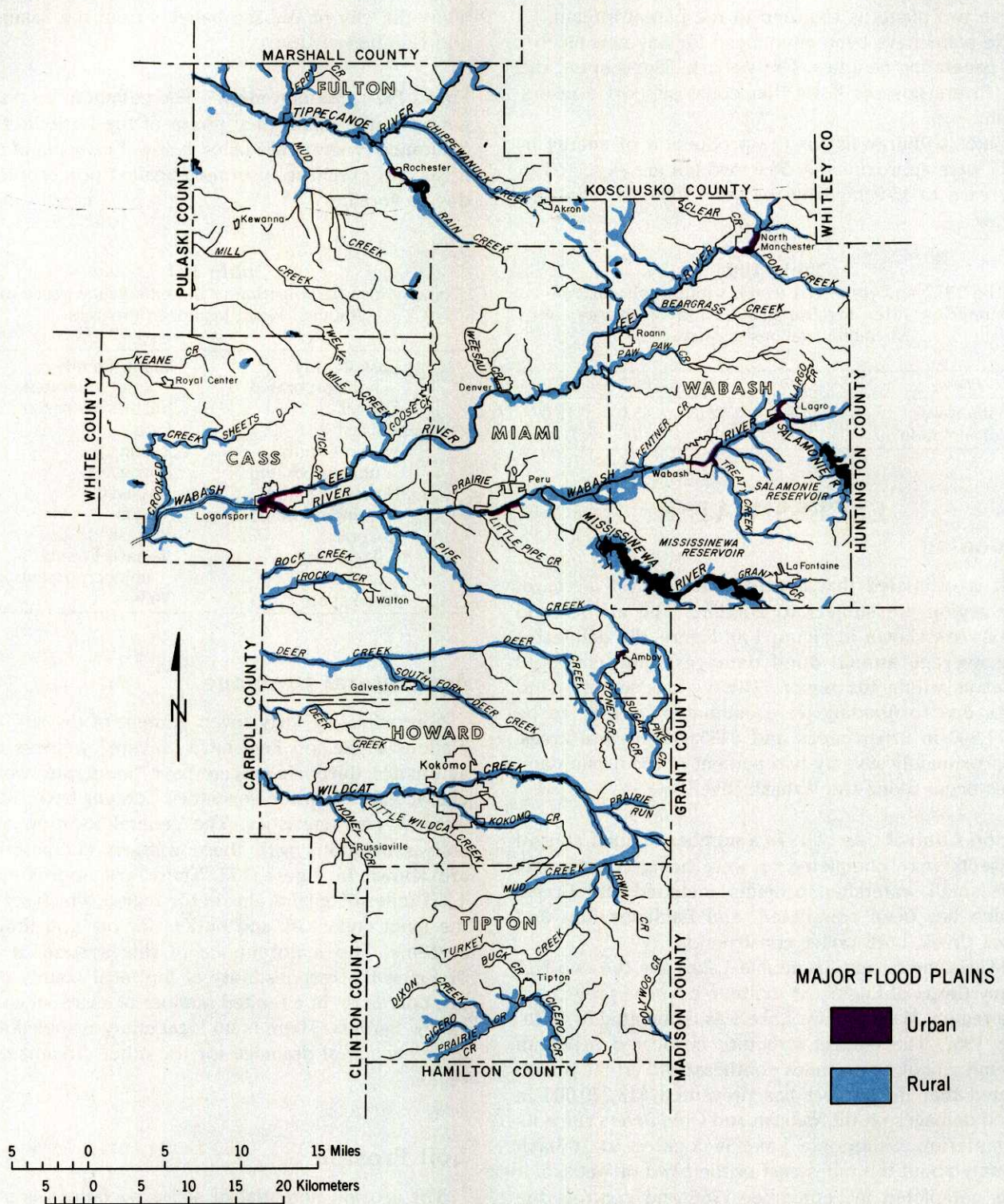
### Agricultural Drainage

Approximately forty-seven percent of the soil associations in Region Five have "severe" wetness characteristics, thirty-six percent have "moderate" wetness characteristics, while seventeen percent have "slight" wetness characteristics. The general location of the soil associations with these wetness characteristics are shown in Figure 132. There are approximately 4,351 miles of legal drains in the region, which serve as the main collectors and outlets for on-farm drainage systems. The maintenance of this system of legal drains is the responsibility of the local county drainage boards or, in a limited number of cases, of conservancy districts. There is no legal entity responsible for maintenance of drainage for the other streams of the region.

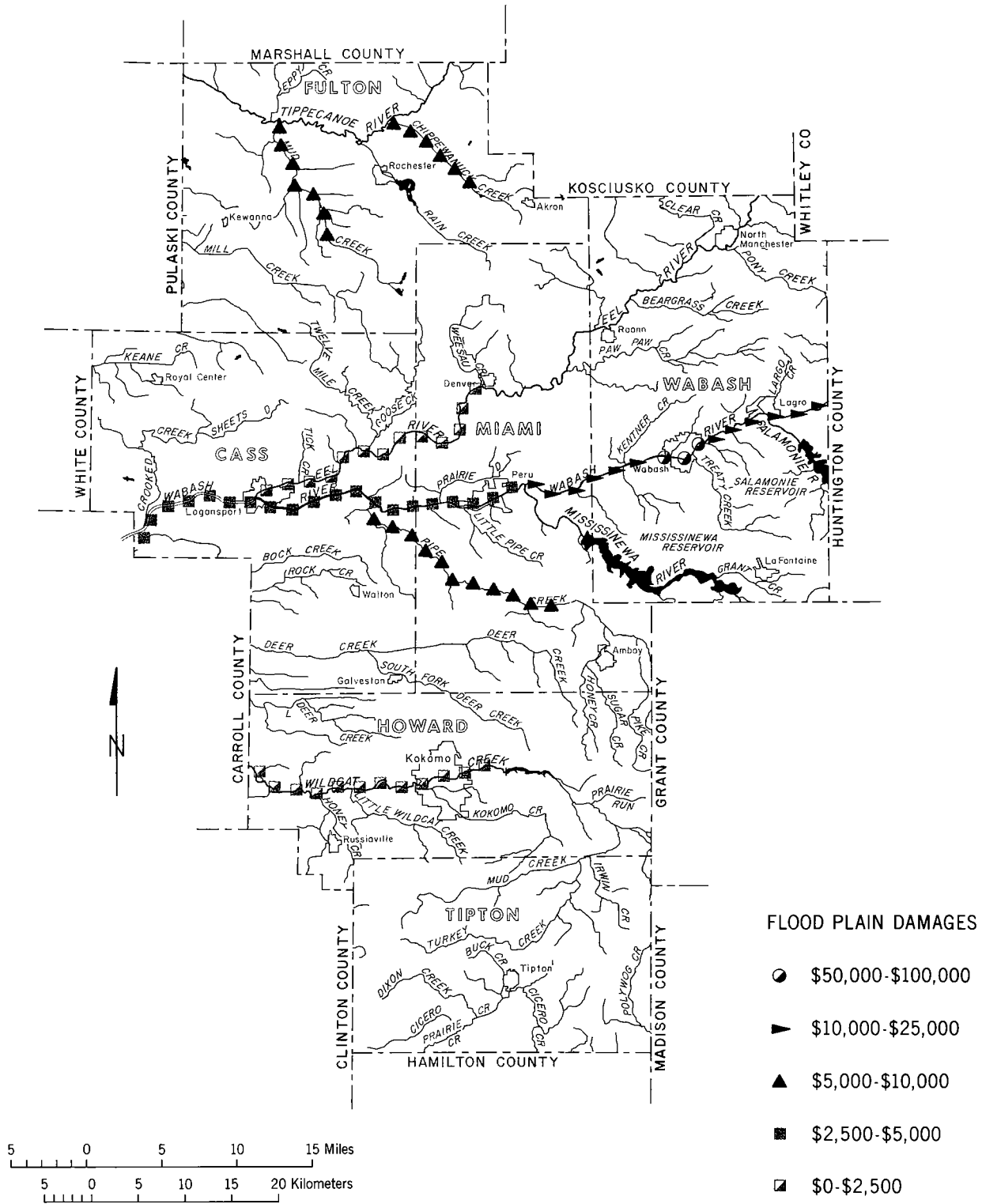
### Soil Erosion

The erosion potential of soil associations is shown in Figure 133. Fifty-nine percent of the 1,367,000 acres is classified as having a "low" erosion potential for land left in a fallow state. Thirty-six percent of the region is rated as having a "medium" soil erosion hazard, while approximately five percent is rated as having a "high" soil erosion hazard.



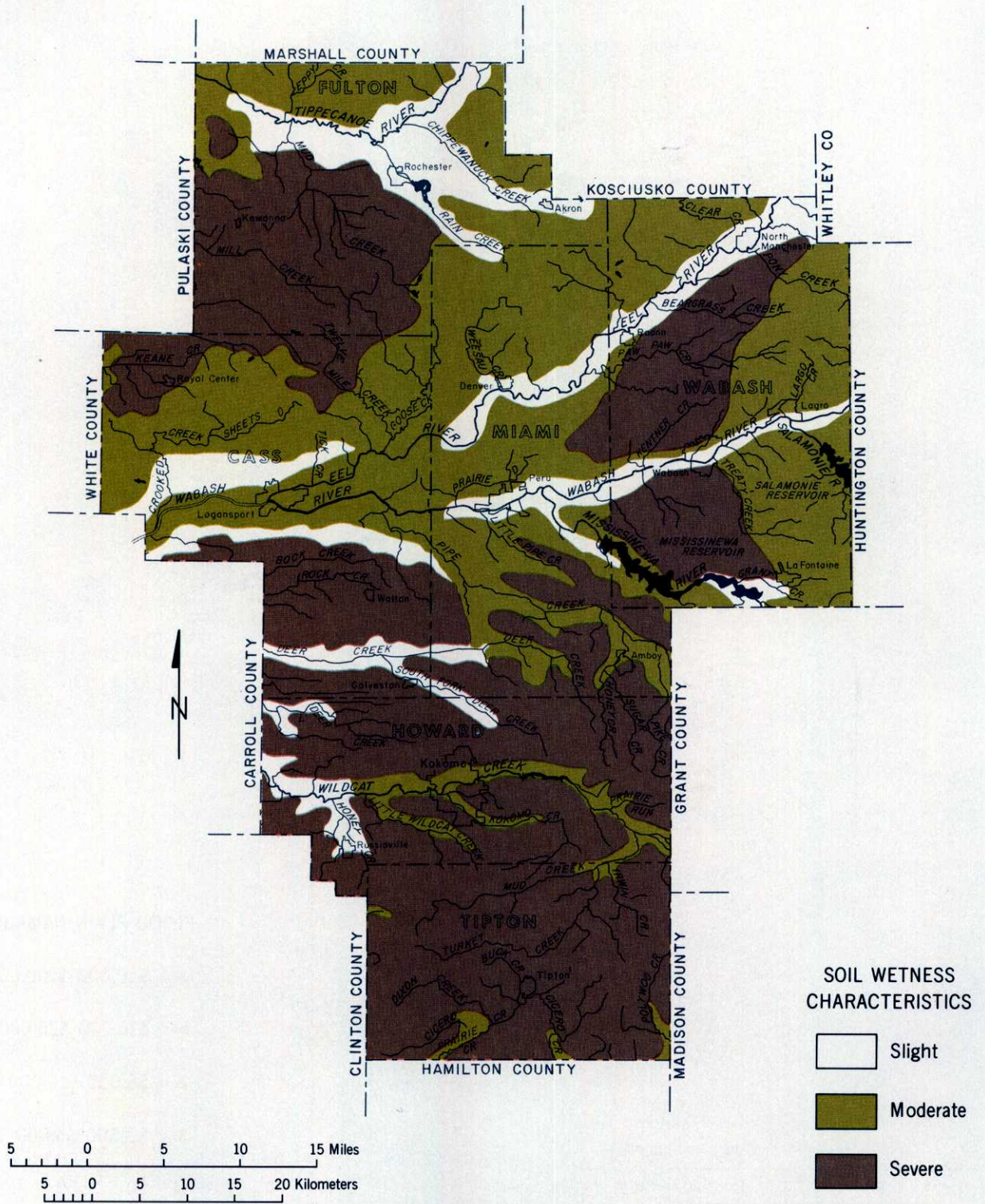


**Figure 130**  
Map of Region Five showing the major floodplains.



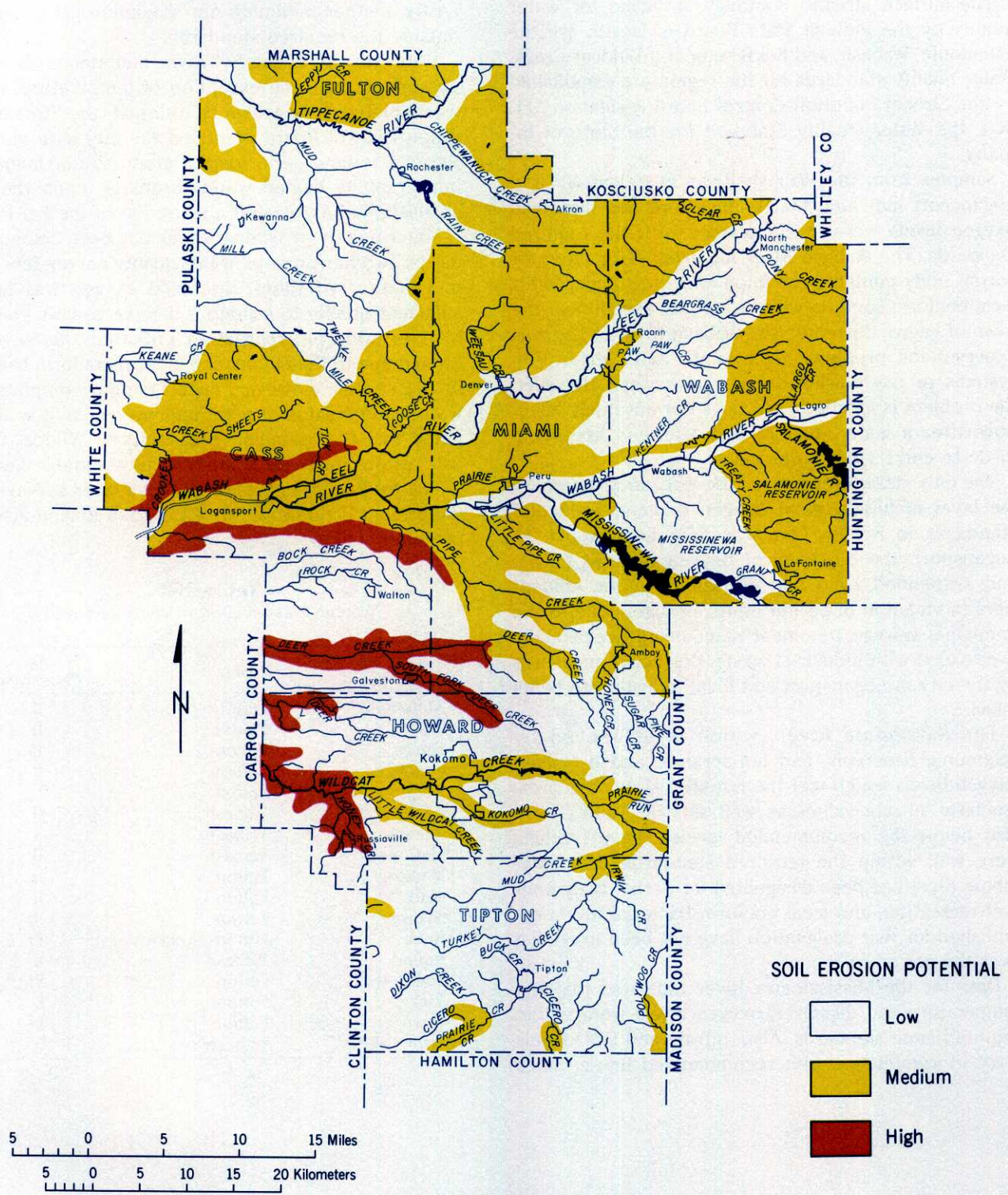
**Figure 131**  
Map of Region Five showing the estimated average annual flood damages per mile along selected streams.





**Figure 132**  
 Map of Region Five showing the location of wetness characteristics  
 of soil associations.





**Figure 133**  
 Map of Region Five showing the erosion potential of the soil associations.



## WATER QUALITY

The surface streams routinely surveyed for water quality by the Indiana State Board of Health are the Salamonie, Wabash, and Eel Rivers, and Wildcat Creek. 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.

Samples from the Wabash River near Wabash and Logansport indicated that temperature and dissolved oxygen levels were in compliance with the required standards. The Wabash River has been designated for partial body contact recreation and the standards for fecal coliform bacteria were being met except near the town of Lagro. Currently, the Wabash River at Lagro is experiencing problems from septic tank absorption systems or overflowing drains and sewers. However, the problem is localized and does not adversely affect downstream water quality, and attempts are being made to correct the problems.

The only stream segment of the Wabash River where the level of biochemical oxygen demand exceeded standards in Region Five was near Logansport. At Logansport, the biochemical oxygen demand (BOD) and suspended solid concentrations in the effluent were in violation of permit limits, probably due to the municipal sewage treatment plant being occasionally overloaded with industrial waste. Corrective measures by the city of Logansport and local industry are being taken.

The Salamonie River, which is influenced by Salamonie Reservoir, had temperature and dissolved oxygen levels which met the required state standards. Similarly, nitrate values as well as BOD values were also below the recommended levels. The pH values were well within the required standards. The Salamonie River has been designated for partial body contact recreation, and fecal coliform bacterial levels established for that designation have not been exceeded over the period of record.

Data for the Mississinewa River indicated that the temperature and dissolved oxygen levels were within required state standards. Also, nitrate and BOD levels were in compliance with recommended levels. Since

fecal coliform concentrations were low, the stream was within permissible limits for partial body contact. Lastly, neither minimum nor maximum pH values fell outside the required standards.

Water quality of the Eel River met standards for all parameters with the exception of temperature, which was violated at Logansport. Although the Stream Pollution Control Board identified the city as a violator, the city is now performing a study to document the impact of its heated water discharge upon the fish, shellfish, and associated aquatic life of the Eel River.

Water quality in Wildcat Creek has been below standards. Two fundamental water quality parameters were in violation. At times, dissolved oxygen was not of sufficient quality to sustain a diverse aquatic community. In addition, recreation potential was severely limited due to the abundance of fecal coliform bacteria in the stream. However, once Kokomo completes its wastewater treatment plant improvements, it is anticipated that the assimilative capacity of Wildcat Creek will restore instream conditions to a suitable level.

The trophic classification of those lakes surveyed by the Stream Pollution Control Board in Region Five are presented below.

**Table 102**  
Trophic classification of lakes surveyed.

<i>Lake</i>	<i>County</i>	<i>Age Classification</i>
Anderson	Fulton	II
Barr	Fulton	II
Bruce	Fulton	II
Fletcher	Fulton	II
King	Fulton	I
Long	Wabash	II
Lukens	Wabash	II
McColley	Wabash	II
Manitou	Fulton	II
Mud	Fulton	II
Nyona	Fulton	II
Rock	Fulton - Kosciusko	III
Round	Wabash	II
South Mud	Fulton	III
Tink	Fulton	II
Town	Fulton	III
Twin Lakes	Wabash	II