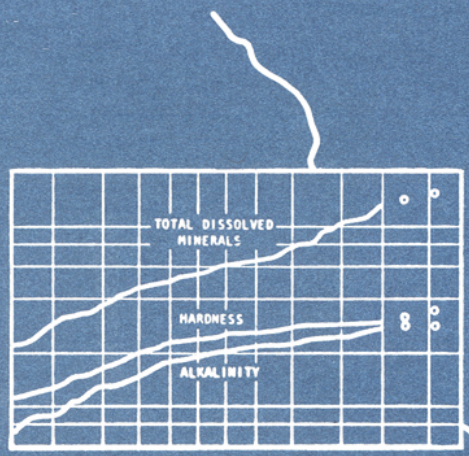
BULLETIN 54
STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION

Quality of Surface Water in Illinois, 1956-1966

by ROBERT H. HARMESON and T. E. LARSON



ILLINOIS STATE WATER SURVEY
URBANA
1969

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by ROBERT H. HARMESON and T. E. LARSON

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Abstract: Surface water quality in Illinois has been determined by means of analysis of data from monthly water sampling programs. Sampling programs have spanned periods of approximately 5 years and have been carried on since 1945 for 61 locations on 45 streams and 1 lake. Data analyzed to show frequencies of median and extreme values of certain mineral constituents for specific streams and sampling periods provide base-line values for future water quality and water resource studies. Comparisons are drawn between water quality for the same stations in two or more sampling periods and also for streams or stations in different geographic or physiographic sections of the state. Attention is drawn to temporal changes in mineral constituents and to potential water quality problems.

Reference: Harmeson, Robert H., and T. E. Larson. Quality of Surface Water in Illinois, 1956-1966. Illinois State Water Survey, Urbana, Bulletin 54, 1969.

Indexing Terms: alkalinity, fluoride, Illinois streams, manganese, mineral quality, nitrate, phosphate, radioactivity, surface water, temperature, total dissolved minerals, total hardness, turbidity, water quality.

URBANA
1969

Printed by authority of the State of Illinois—Ch. 127, IRS, Par. 58.29

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ABSTRACT

This publication provides data on surface water quality in 35 streams at 44 sampling locations during two 5-year sampling periods between 1956 and 1966. Some previously published data are included in order to make comparisons of water quality during different time periods. Radioactivity data from 41 sampling locations during 1957-1966 also are presented.

Results of statistical analyses, with graphic summaries, for temperature, turbidity, total dissolved minerals, hardness, alkalinity, nitrate, and manganese are given. Summaries of these data for each sampling location, arranged alphabetically by stream name, are accompanied by the tabulations of mineral quality for the streams sampled, with available physical data.

Also reproduced in part are rules and regulations of the Illinois Sanitary Water Board pertaining to surface water quality. The data indicate that Illinois surface waters, with but few exceptions, meet specified concentrations of mineral constituents.

The analyses of water quality by statistical means present, at best, a representative picture of stream conditions during a particular sampling period. In addition, the data assembled and analyzed can shed some identifying light on conditions which may lead to future problems.

INTRODUCTION

Surface water resources have long served a vital role in Illinois development and growth. With competition increasing among the many beneficial uses made of water, the future role of surface water resources will become increasingly important.

The surface water resources of Illinois are constantly changing in time as well as by season at all locations. This is true for streamflow, lakes, and reservoirs, and is largely caused by variations in precipitation and climatic conditions leading to droughts and floods. Also inherent are increasing modifications in mineral and bacterial quality brought about both by natural causes and by man-made causes such as construction of reservoirs, changing agricultural practices,- and contribution at points of waste disposal. Man's influence is great and is increasing rapidly.

Some idea of the influence of man on water resources is revealed by comparison of the potential resource available with its uses and the size of the demands now made on it, together with some projection of future demands. The estimates shown here were taken from the 1967 State Water Plan.[1] Although this bulletin is directly concerned with the mineral qualities of surface water, comparisons for both groundwater and surface water resources are pertinent.

It has been estimated that in Illinois the available sustained groundwater yield is approximately 7 billion gallons per day (bgd). This estimate considers that it is feasible to capture and withdraw one-half of the total theoretical potential groundwater yield. The potential yield of streamflow, based on the flows available 95 percent of the time, is approximately 43 bgd. Existing water supply reservoirs have a potential yield of an additional 0.054 bgd. Thus the total potentially available water resource in the state stands at about 50 bgd. Full development of potential reservoirs could increase reservoir yield by another 2.2 bgd.

In 1965 total withdrawals of groundwater for both municipal and industrial use amounted to approximately 0.53 bgd. Rural water use, exclusive of irrigation, was approximately 0.11 bgd, and probably a major percentage of this was withdrawn from the groundwater. Use of water for irrigation in Illinois is fairly nominal, with approximately 50 percent of the irrigation water used being withdrawn from groundwater. Industrial use of groundwater was about half of the total, or about 0.254 bgd. Industrial withdrawals of surface water, exclusive of that used for cooling purposes in steam-electric power production, totaled 1.19 bgd. Municipal surface water withdrawals amounted to 1.47 bgd. The electric power generating industry used a total of 13.0 bgd for cooling purposes. This represents a once-through use in which the most significant change in water quality is the addition of heat and subsequent loss of water by evaporation.

Thus, in 1965 approximately 90 percent of the water withdrawals in the state were from surface water sources if the quantity used for cooling purposes is excluded, or

96 percent if the cooling water use is included. The quantity of surface water used by Chicago and its suburbs introduces a bias into these percentages. If the Chicago withdrawals are excluded, the remainder of the state is meeting about 45 percent of its water needs, exclusive of cooling, by the use of surface water.

Demands for water in the future have been projected to increase as shown in table 1. In addition to the uses listed, large quantities of surface water are used every day for navigation, for recreational uses, for the support and growth of aquatic life and wildlife, and for the transport and assimilation of man's waste products. The amounts needed for these uses are difficult to express quantitatively and therefore are not shown in the table.

Table I. Water Demands for Selected Dates

(Amounts in billion gallons per day)

	1965	1980	2020
Municipal use	1.76	2.65	3.70
Rural use (nonirrigation)	0.11	0.13	0.18
Industrial use (noncooling)	1.44	2.22	3.00
Subtotal	3.31	5.00	6.88
Power generation (cooling)	13.00	31.10	162.80
Total	16.31	36.10	169.68

Because of the quantities of surface water used now in Illinois and projected as future needs, and because of the many ways in which surface water serves the needs of the state's growing population, data on surface water mineral quality are important. Such data serve as a base for comparison and evaluation of existing quality with man-made standards that are often established arbitrarily or may be based on more or less ideal conditions. Quality data are also useful for determining the methods and amount of treatment required to prepare water for specific intended uses.

The text of this bulletin presents discussions of the surface water quality data and analyses, the significance of the mineral constituents analyzed, and the radioactivity data. The text portion is followed by data summaries for each sampling location, arranged in alphabetical order by stream name.

Acknowledgments

This report was prepared under the general administrative direction of William C. Ackermann, Chief of the Illinois State Water Survey. All of the chemical analyses, with the exception of those for samples collected and analyzed by personnel of the Central Illinois Public Service Company, were made by members of the Survey's Chemistry Section under the supervision of Laurel M. Henley. Plotting of data for the log-probability and duration curves was largely done by David Porter and Mrs. L. W. Butler.

Special acknowledgment is made to other Water Survey personnel: to Dr. James C. Neill and his staff, and to M. C. Clevenger, for their contributions to the statistical analysis of the data collected; to John W. Brother, Jr., and William Motherway, Jr., for their skills in preparation of graphic presentation of the data involved; and to Mrs. J. L. Ivens and Mrs. P. A. Motherway for their editorial preparation of the manuscript.

We are grateful to William D. Mitchell, District Chief, Water Resources Division of the U. S. Geological Survey at Champaign, and his staff who collected most of the water samples and provided flow data at the time of collection of samples for the streams studied. Gratitude is also expressed to personnel of the East St. Louis and Interurban Water Company and the Cairo Water Company for their participation in this program.

DATA AND ANALYSES

Since the qualities of surface waters are constantly changing, it is almost impossible to establish their 'natural' characteristics. An alternative is to establish the characteristics at some base period and compare subsequent changes with time, from which it is possible to estimate or determine the causes for observed changes.

Sampling

The Illinois State Water Survey, in cooperation with the Champaign District Office of the U. S. Geological Survey and others, has maintained a continuous program of sampling and analysis of surface water sources since 1945. The program has been so arranged that consecutive monthly samples are collected from several locations throughout the state and analyzed for 5-year periods. Between 1945 and 1966, 61 locations on 45 streams and 1 lake have been used, some for more than one 5-year period. Sampling periods for all stations do not coincide exactly, and some shifting of dates will be noted throughout this report.

Characteristics of surface water mineral quality at 23 sampling locations were reported in Water Survey Bulletin 45, *Quality of Surface Waters in Illinois.*[2] That bulletin included two 5-year sampling periods between 1945 and 1956. This bulletin includes the two sampling periods between 1956 and 1966 and contains data from 44 sampling stations, 38 of which were at locations different from those sampled in the 1945-1956 period. At 11 of

these stations data are available for two consecutive sampling periods, which provides some insight into changes in quality with time. Locations of all sampling stations included in the program between 1945 and 1966 are shown in figure 1, identified by map numbers as listed in table 2. Also identified are 15 stations being used in the sampling program since 1966. Table 2 also provides exact sampling dates for each station and the stream gage number used by the U. S. Geological Survey at that location.

Analyses

Individual chemical determinations for the samples were analyzed by the procedures (usually the current *Standard Methods of Analysis of Water and Wastewater*[3]) outlined in table 3. Results of determinations are expressed as milligrams per liter (mg/l).

Phosphate was not determined routinely before 1960, but available data are presented. Nitrate and ammonia determinations in some cases may not be necessarily rep-

Table 2. Station Locations and Sampling Periods

Sampling station	Map number (*Fig. 1*)	USGS number	Sampling period
Apple River near Hanover	14	5-4190	1957-61
Bay Creek at Nebo	77	5-5130	1961-66
Bear Creek near Marcelline	74	5-4955	1966-
Beaucoup Creek near Matthews	93	5-5990	1961-66
Big Creek near Wetaug	95	5-6000	1961-66
Big Muddy River at Murphysboro	107	5-5995	1956-61
Big Muddy River at Plumfield	92	5-5970	1945-50
Blackberry Creek near Yorkville	208	5-5517	1961-66
Blue Grass Creek near Raymond	205	5-5936	1961-66
Bonpas Creek at Browns	87	3A3780	1961-66
Cache River at Forman	96	3A3875	1956-61
Coon Creek at Riley	20	5-43825	1961-66
Crab Orchard Lake at Station 5	108	5-5478	1951-56, 1956-61, 1961-64
Crab Orchard Lake at Wolf Creek Bridge	109	5-5977	1951-56, 1956-61, 1961-64
Crane Creek near Easton	70	5-5825	1961-66
Des Plaines River near Des Plaines	3	5-5290	1966-
Drowning Fork at Bushnell	206	5-5344	1961-66
Du Page River at Troy	6	5-5405	1945-50
Edwards River near New Boston	44	5-4665	1966-
Edwards River near Orion	43	5-4550	1966-
Elkhorn Creek near Penrose	22	5-4440	1961-66, 1966-
Embarras River near Camargo	209	3-3434	1961-66, 1966-
Embarras River at Ste. Marie	84	3A3455	1956-61
Flat Branch near Taylorville	61	5-5745	1961-66
Fox River at Algonquin	2	5-5500	1956-61, 1966-
Fox River at Dayton	30	5-5525	1956-61
Green River near Geneseo	26	5-4475	1945-50
Hadley Creek near Barry	75	5-5100	1956-61
Hayes Creek at Glendale	97	3A3850	1961-66
Henderson Creek near Oquawka	47	5-4690	1966-
Illinois River at Meredosia	104	5-5855	1955-60, 1960-66
Illinois River at Peoria	102	5-5600	1945-50, 1957-61, 1961-66, 1966-
Indian Creek at Wanda	79	5-5880	1945-50
Iroquois River at Iroquois	36	5-5250	1950-56
Kankakee River at Momence	34	5-5205	1966-
Kankakee River near Wilmington	32	5-5275	1957-61
Kaskaskia River at New Athens	81	5-5950	1945-49, 1957-61, 1961-66
Kaskaskia River at Shelbyville	105	5-5920	1956-61, 1961-66, 1966-
Kaskaskia River at Vandalia	106	5-5925	1950-56, 1966-
Kishwaukee River near Perryville	18	5-4400	1966-
La Moine River at Colmar	73	5-5845	1957-61
La Moine River at Ripley	72	5-5850	1945-50
Little Wabash River at Carmi	89	3A3815	1957-61
Little Wabash River near Effingham	119	3-3786.5	1966-
Little Wabash River near Wilcox	86	3A3795	1950-55
Mackinaw River near Congerville	53	5-5675	1966-
Mackinaw River at Green Valley	103	5-5680	1950-56
Macoupin Creek at Kane	78	5-5870	1945-50
Mary's River near Sparta	94	5-5955	1966-
Mississippi River at Chester	112	7-0206	1955-60, 1960-65
Mississippi River at East St. Louis	111	7-0100	1958-61, 1961-66, 1966-
Mississippi River at Keokuk	110	5-4745	1950-55
Mississippi River at Thebes	113	7-0220	1950-56
North Fork Embarras River near Oblong	85	3A3460	1961-66
North Fork Mauvaise Terre Creek near Jacksonville	118	5-5860	1966-
Ohio River at Cairo	114	3-6125	1958-61, 1961-66, 1966-
Ohio River at Metropolis	115	3A3870	1950-56
Otter Creek near Palmyra	203	5-5868	1961-66
Pecatonica River at Freeport	16	5-4355	1966-
Rock River at Como	23	5-4435	1956-61, 1961-66
Saline River near Junction	90	3A3825	1945-50
Salt Creek near Rowell	65	5-5785	1950-56
Sangamon River at Mahomet	59	5-5710	1966-
Sangamon River at Monticello	60	5-5720	1956-61
Sangamon River near Oakford	71	5-5830	1956-61
Seven Mile Creek near Mt. Vernon	207	5-5958	1961-66, 1966-
Shoal Creek near Breese	82	5-5940	1966-
Skillet Fork at Wayne City	88	3A3805	1945-50, 1957-61
South Fork Sangamon River near Rochester	62	5-5760	1966-
Spoon River at London Mills	49	5-5695	1945-50, 1957-61
Vermilion River at Catlin	56	3A3385	1950-56
Vermilion River at Lowell	39	5-5555	1957-61, 1966-
Vermilion River at Pontiac	38	5-5545	1957-61
Wabash River at Mt. Carmel	116	3A3775	1950-56
Wabash River at Riverton, Ind.	117	3-3420	1955-60, 1962-66
Wolf Creek near Beecher City	201	5-5923	1961-66, 1966-

Figure 1. Sampling station locations and watersheds

Table 3. Analytical Procedures

Determination	Symbol	Analytical procedure
Iron (total on unfiltered sample)	Fe	Ortho-phenanthroline (colorimetric)
Manganese (total on unfiltered sample)	Mn	Periodate (colorimetric)
Fluoride	F	Scott-Sanchis (colorimetric)
Boron	B	Curcumin (colorimetric)
Silica	SiO_2	Molybdate (colorimetric)
Phosphate	PO_4	Bismuth catalyzed PO_4 method (colorimetric)
Chloride	Cl	Mohr (volumetric)
Sulfate	SO_4	Barium sulfate (gravimetric)
Nitrate	NO_3	Reduction, distillation, and nesslerization (colorimetric)
Ammonium	NH_4	Distillation and nesslerization (colorimetric)
Calcium	Ca	EDTA titration (volumetric)
Magnesium	Mg	Calculated
Sodium	Na	Calculated
Alkalinity	(as $CaCO_3$)	Methyl orange titration (volumetric)
Hardness	(as $CaCO_3$)	EDTA titration (volumetric)
Total dissolved minerals	TDM	Residue on evaporation

resentative because of difficulties involved in preventing bacterial growth and nitrification (oxZidation) during transport. Recently, samples collected for nitrogen analyses have been treated with chloroform.

Results of determinations for turbidity, total dissolved minerals, hardness, alkalinity, nitrate, and manganese were analyzed statistically and summarized graphically; temperature and available flow data were treated similarly. All of the individual chemical determinations were tabulated, and these tabulations are included along with the analyzed data in the data summaries for each sampling station starting on page 23.

Data analyses have been presented in generally the same manner as in Bulletin 45, that is, as frequencies of occurrences of concentrations instead of extremes and averages. The mineral characteristics are again summarized graphically but differ slightly from those in Bulletin 45 in that the proportions of alkalinity to total dissolved minerals have been replaced by frequency curves for nitrate and manganese. The characteristics chosen for graphic summary were those thought to be most useful to a wide cross section of readers, including resource planners, design engineers, and water quality control chemists and engineers. The characteristics are representative of the existing water quality. As such they can well serve as the basis for design of water treatment, can be compared with existing standards for water quality, can serve as a basis for establishing realistic standards, and can be useful in water quality control methods and procedures.

Hydrologic and Physiographic Relations

Although in the graphic summaries turbidity and discharge appear on the same figure, it is important to indicate that the two are not directly related, as the curves appear to suggest. This was illustrated in Bulletin 45, where it was shown that although high turbidities and low total dissolved minerals, alkalinities, and hardness often occur at about the same time and with similar frequencies as high discharge rates, there is no consistent specific relationship.

No attempt is made to establish a relationship between watershed size and variability in streamflow or water quality, since previous attempts to do so were unsuccessful. Instead, data were compared on the basis of generalized watershed physiography and comparative values of Lane's Variability Index,[4] which obviates the necessity for much of the arduous soil association classifications made in Bulletin 45. The physiographic regions (figure 2) set forth by the State Geological Survey[5] were used as a base for these comparisons. The data were grouped into nine classifications, eight for intrastate streams and the ninth for intersectional streams such as the Illinois, Mississippi, Ohio, and Wabash Rivers which either flow through several physiographic regions or border the state.

These nine groupings, generally related to physiographic classifications, are shown in figure 3 together with data on turbidity, hardness, and total dissolved minerals, and Lane's Variability Index. For comparison, 12 stations with data from Bulletin 45 are included on figure 3 in addition to 42 of the 44 locations analyzed in this bulletin.

The variability in streamflow is generally lowest in northern (group 1) streams, less so in the central (groups 2, 4, 5) and western (groups 3, 6, 8) streams, and greatest in the southern (group 7) streams. Physiographic conditions in these areas are such that sustained groundwater contribution in the northern latitudes is higher than in the southern, particularly when precipitation is near or below normal.[1] It has been shown previously in Bulletin 45 that physiographic features are also responsible for the relatively low variability in mineral content and composition in the northern section of the state.

The hardness of surface waters is greatest in the northern section, and a general decrease is evident in moving southward through the central and to the southern section. High hardness in northern surface waters is largely due to the high sustained groundwater contribution, which is of relatively greater hardness. Surface runoff is also exposed to soil materials which are of recent glacial origin and are richly mineralized. Thus the waters of the northern streams are generally more highly mineralized but are not as variable in mineral content as are the southern streams. Toward the southern part of the state, although there is less groundwater contribution to streamflow, the groundwater which is contributed is apt to be highly mineralized, thus partially accounting for the greater degree of variability in total mineral composition in southern streams.

Figure 2. Physiographic divisions for Illinois

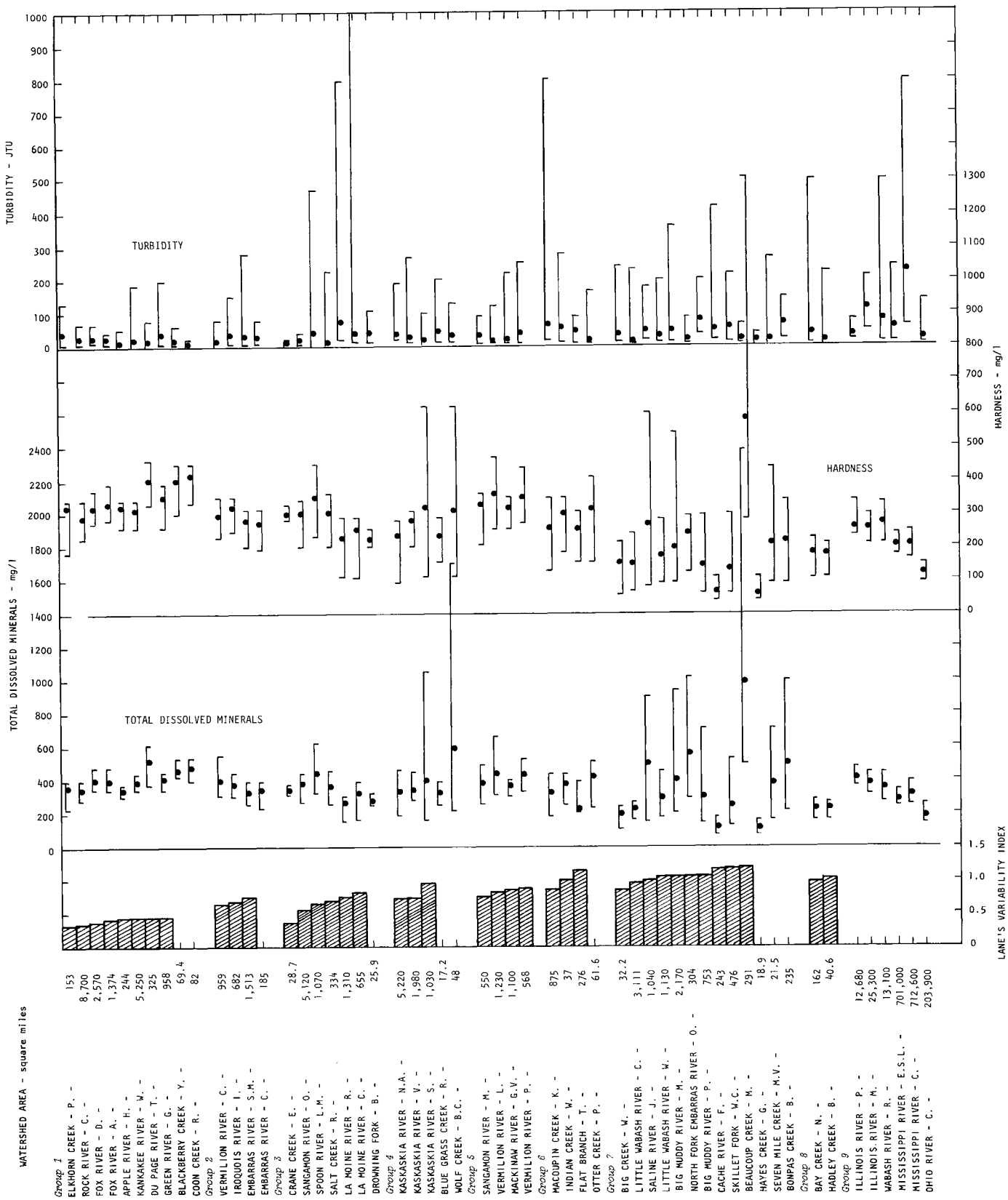


Figure 3. Relation of water quality to physiographic area

SIGNIFICANCE OF MINERAL CONSTITUENTS

Water quality is a very general term involving the physical, chemical, and biologic characteristics of water. Mineral quality is usually defined in terms of the degree to which various mineral, or chemical, constituents are dissolved in water. The presence of some minerals can have more importance than that of others, particularly in relation to the intended use of the water, to the methods and costs of treatment required to prepare it for use, and possibly to measures for water quality control. The significance of certain physical and mineral characteristics are discussed in this section under individual constituents.

Water Quality Criteria

The Illinois Sanitary Water Board has established rules and regulations[6] for both interstate and intrastate waters which include criteria for the evaluation of surface water quality at the point at which water is withdrawn for treatment and distributed as a potable supply. Those parts of Rule 1.04 which are pertinent to analyses made by the Water Survey are reproduced as follows:

> b) Dissolved solids: Not to exceed 500 mg/l as a monthly average value, nor exceed 750 mg/l at any time. Values of specific conductance of 750 and 1025 micromhos/cm (at 25 deg. C) may be considered equivalent to dissolved solid concentration of 500 to 750 mg/l.
> c) Chemical Constituents: Not to exceed the following specific concentration at any time:
>
> Stream Samples
>
> | Constituent | Concentration mg/l |
> |---|---|
> | Ammonia Nitrogen(N) | 2.5 |
> | Chloride | 150 |
> | Fluoride | 1.00 |
> | Iron (total) | 0.3 |
> | Nitrate (as NO_3) | 45 |
> | Phosphate | 4.0 |
> | Sulphate | 200 |
> | Temperature | 90°F |
>
> d) Radioactive substances: Gross beta activity in the known absence of Strontium 90 and alpha emitters not to exceed 1,000 pico curies per liter at any time. "Absence of" is defined as not more than 10 pico curies of Strontium 90 and 3 pico curies of alpha radiation.

These rules and regulations were adopted by the Sanitary Water Board in 1968. The data analyzed in this bulletin illustrate that only in rare instances do the surface waters of Illinois fail to meet the specified concentrations of chemical constituents.

Turbidity

Turbidity is the empirical measure of the presence in water of suspended insoluble particles such as clay, silt, and/or finely divided organic matter. The expression of turbidity in terms of Jackson turbidity units (Jtu) is a measure of the optical properties of the suspended particles. It is not synonymous with nor directly related to the weight concentration of suspended matter because of the lack of correlation between size, shape, and refractive index of the particles, which are the principal optical property determinants, and the concentration and specific gravity of the suspended particles.

Nevertheless, turbidity is a significant gauge of quality both in raw and treated water. The *Public Health Service Drinking Water Standards*[7] states that a maximum of 5 units of turbidity in treated or delivered water is the level at which this characteristic becomes objectionable to a large number of consumers, and may result in their turning to alternative supplies of less safe quality.

Turbidity measurements of water in its natural state can give a significant but inexact indication of the extent of the processes of erosion and sediment transportation. Siltation of water supply reservoirs is an important consideration affecting their design, location, and construction, as well as the design and control of water treatment methods.

Turbidity in surface waters is influenced by many factors—watershed size, rate of streamflow, amount of base flow from groundwater, topography, soil types, vegetative cover on the watershed, land use practices, precipitation and runoff characteristics, and on occasion pollution contributions.

Turbidities in Illinois surface waters are sufficiently high to require universal filtration before use for domestic water supply.

Total Dissolved Minerals

This designation represents the dissolved mineral matter in the sample, as determined by evaporation of a filtered sample.

In natural surface waters the dissolved minerals mainly consist of the carbonates, chlorides, nitrates, and sulfates of calcium, magnesium, sodium, and ammonium. Numerous other mineral elements are also found in natural surface waters, but their concentrations may be small and their effects relatively insignificant.

Total mineral content of water can have various economic, aesthetic, and physiological effects. Water with high mineral content may have an objectionable taste. The *Public Health Service Drinking Water Standards* recommends an upper limit of 500 mg/l total dissolved minerals. Total mineral content of more than 500 mg/l can be tasted. Ten of the streams reported on in this bulletin have total dissolved mineral concentrations greater than 500 mg/l for 10 percent of the time. However, only one

has a median concentration greater than 500 mg/l. It should be recognized that this is a recommended upper limit and applies specifically to finished or distributed domestic water. It is not directly related to the raw water characteristic.

Total dissolved mineral content is often important to industrial, agricultural, and household users of surface water supplies. Where water is used as an ingredient with other raw materials in the finished product, the recommended threshold value of total dissolved minerals may be as low as 50 mg/l. Where water is used as a source of steam, particularly in high pressure boilers, the water is often treated to reduce the total dissolved mineral content to very low levels.

Although it is largely true that the concentration of salts in natural irrigation water is rarely high enough to cause immediate crop damage, successive irrigations may result in a buildup in the concentration of the soil solution at the root zone, and finally result in failure of the irrigation program.

It appears that animals can tolerate higher total mineral content than men, but as with men, the continued use of highly mineralized water by animals can cause varying degrees of physiological disturbances. At about 4000-6000 mg/l livestock do not thrive although they can exist on higher levels, in some cases up to 15,000 mg/l.

Hardness

Hardness in water is caused primarily by the compounds of calcium and magnesium. The effects of hard water are primarily economic, in that money must be spent on equipment and treatment for removing all or part of the hardness from water before it can be used for many specific purposes.

Hardness, or the distinction between hard and soft water, is largely relative,[2] making it difficult to classify within absolute ranges. The State Water Survey classifies hardness (expressed as mg/l $CaCO_3$) as follows: 0—75, soft; 75—125, fairly soft; 125—250, moderately hard; 250—400, hard; and over 400, very hard. On the basis of this classification, and the median hardness concentrations of streams reported in this study, there are 2 streams in which the water is very hard, 21 which are hard, 4 moderately hard to hard, 14 moderately hard, 1 fairly soft to moderately hard, and 2 soft. Included are the Ohio River in which the water is fairly soft, and the Illinois, Mississippi, and Wabash Rivers, all of which are moderately hard. Sixteen of these streams are used for public water supplies.

The effects of hard water are numerous and usually are disadvantageous to the user. The detrimental effects of hardness include excessive consumption of soap and detergent products,[8] interference with industrial processes, and the formation of scales or sludges in boilers, water heaters, piping, and cooking utensils.

The proportions of carbonate and noncarbonate hardness present in water have significant influences on the type of scale formation encountered and upon the cost of treatment for hardness removal. If an appreciable proportion of the total hardness is noncarbonate hardness, the scale formed can be expected to be hard, and difficult to remove. The presence of noncarbonate hardness in water requires the use of a more expensive chemical in the lime-softening process, thus adding to the cost of treatment.

Although surface waters in the northern sectors of the state generally have the highest total hardness, noncarbonate hardness is usually highest in the southern streams.

Alkalinity

Alkalinity is not a specific substance found in water, but instead is the combined effect of several substances and conditions.[2] It is largely caused by the presence of carbonates, bicarbonates, and hydroxides, which contribute to the power of neutralizing hydrogen ions in solution. Its determination in surface waters, when related to hardness and pH, is significant to municipal and industrial users and to their choice of water treatment processes.

Nitrates and Phosphates

More emphasis is given to nitrates than to phosphates in this report for several reasons. In addition to being a fairly common nutrient compound, high nitrates can be hazardous to health. Also more data are available for nitrate than for phosphate concentrations. Analyses for phosphates were not made routinely before 1960, and the analysis for phosphates is probably less accurate than that for nitrates.

Nitrates, which are the end products of the aerobic stabilization of ammonia and organic nitrogen, can occur in water as the result of many factors. Polluted surface waters which have undergone self-purification can produce nitrates, as do the aerobic waste treatment processes. Wastes from chemical fertilizer manufacturing can be a significant source of nitrates. Another source may be the runoff and drainage from fertilized fields.

Concern with high nitrate concentrations in water is currently aimed at two effects or hazards. Infants who are using liquid feeding formulas are subject to nitrate poisoning or methemoglobinemia. Because of this hazard an upper safe limit for water supply has been recommended as 45 mg/l NO_3 and NO_2 (as NO_3) in the *Public Health Service Drinking Water Standards* of 1962.[7]

The second effect of nitrate concentration for which there is concern is the degradation of surface water quality by biological growths. Nitrogen is one of several common nutrients which can stimulate excessive algal growths, and lead to accelerated eutrophication of lakes and reservoirs. Many water quality investigators take the position that

the limiting factors in the control of aquatic plant growth are the nitrogen and phosphorus concentrations. However, there is no clear concensus on the limiting concentrations of these nutrient constituents. Sawyer et al.[9] reported on the occurrence of nuisance algal blooms in Wisconsin lakes with average annual concentration of nitrogen and phosphorous above 0.3 and 0.015 mg/l, respectively. Bartsch[10] has indicated that a gradual chemical buildup is apparent in Lake Michigan, where total inorganic nitrogen averages 0.19 mg/l and total phosphate is approximately 0.02 mg/l. Soluble phosphate averaging 0.44 mg/l (15 times the concentration considered critical for the production of nuisance growths of algae) has been found in Milwaukee Harbor.[10]

Repetition of the routine 5-year sampling program at stations on the Skillet Fork and on the Illinois, Kaskaskia, Mississippi, Ohio, Rock, and Wabash Rivers presented an opportunity for investigating the occurrence of nutrient compounds in Illinois surface waters. Table 4 gives the concentrations of nitrate (NO_3), phosphate (PO_4), fluoride (F), chloride (Cl), total dissolved minerals (TDM), and hardness (Hd) which were not exceeded for 10, 50, and 90 percent of the time during three 5-year sampling periods between 1945 and 1966.

Table 4. Mineral Concentration Changes with Time

	Concentration (mg/l) not exceeded for given percent of time								
	1945-1951			1956-1961			1961-1966		
Constituent	10%	50%	90%	10%	50%	90%	10%	50%	90%
Illinois River at Peoria									
NO_3	5.2	9.5	16	3.5	10.4	17.7	11.2	18.8	26.2
PO_4				0.6	1.1	2.5	1.0	2.15	6.0
F				0.2	0.5	0.6	0.4	0.7	1.7
Cl	11	26	37	21	31	41	27	37	55
TDM	275	340	395	330	380	440	365	410	475
Hd	200	250	300	220	265	320	235	260	340
Kaskaskia River at New Athens									
NO_3	2.0	5.0	9.5	1.5	4.3	9.2	0.6	5.0	15.9
PO_4				0.2	0.3	0.65	0.1	0.3	0.7
F				0.1	0.2	0.3	0.1	0.2	0.3
Cl	9	24	87	16	50	83	18	33	68
TDM	130	290	300	150	320	500	190	340	460
Hd	85	190	300	80	220	300	95	235	280
Kaskaskia River at Shelbuville									
NO_3				0.45	8.2	23	1.1	12.9	34.9
PO_4				0.15	0.4	0.7	0.2	0.3	0.8
F				0.1	0.3	0.5	0.1	0.3	0.4
Cl				11	26	80	16	28	72
TDM				160	400	1050	330	405	815
Hd				110	320	620	260	325	470
Mississippi River at East St. Louis									
NO_3				2.4	6.0	11	4.2	8.2	14
PO_4				0.2	0.4	1.3	0.15	0.5	1.15
F				0.1	0.2	0.3	0.1	0.3	0.4
Cl				12	15	21	10	16	23
TDM				210	280	300	245	285	345
Hd				155	200	240	175	205	240
Ohio River at Cairo									
NO_3				1.6	3.8	6.6	2.1	4.3	8.0
PO_4				0	0.1	0.2	0	0.1	0.9
F				0.1	0.2	0.4	0.2	0.2	0.4
Cl				11	18	28	12	18	35
TDM				150	200	250	140	185	260
Hd				100	135	160	95	120	150
Rock River at Como									
NO_3				2.2	6.4	12	4.6	9.6	17.8
PO_4				0.3	0.7	0.95	0.5	0.9	1.8
F				0.1	0.1	0.2	0.1	0.1	0.2
Cl				10	15	20	10	17	25
TDM				285	340	390	295	340	425
Hd				225	290	340	230	290	356
Skillet Fork at Wayne City									
NO_3	0.45	1.8	3.6	1.1	2.5	4			
PO_4				0	0.1	0.2			
F				0.1	0.2	0.2			
Cl	10	21	43	12	32	94			
TDM	110	350	430	125	250	530			
Hd	60	170	255	60	135	300			
Wabash River at Riverton, Indiana									
NO_3				3.5	11.5	26	1.4	10.8	29.7
PO_4									
F									
Cl				15	21	29	19	28	34
TDM				225	340	405	270	360	445
Hd				170	265	330	210	275	335

The data indicate, with the exception of the Kaskaskia River at New Athens and the Wabash River at Riverton, Indiana, apparent increases in nitrate concentrations in Illinois streams with the passage of time. There is no clear correlation from these data to distinguish between the proportions of nitrates entering surface waters from sewage effluents and from agricultural runoff. Nor is there a clearly defined correlation between nitrate concentration and physiographic conditions, although it is generally true that the lowest concentrations and the least variability about the median concentration are found in the southern part of the state. Another source of higher nitrate concentration in northern surface waters may be from groundwater, since subsoil groundwater contributions to surface waters are higher there than in southern Illinois.

Data for observed nitrate and phosphate concentrations at 43 sampling stations have been arranged in a different manner in table 5. In addition to showing the concentrations not exceeded for 10, 50, and 90 percent of the time, table 5 shows the percentages of time in the sampling periods during which the nitrate and phosphate concentrations exceeded certain recognized limits. For nitrate these limits were 1.33 mg/l (equivalent to 0.3 mg/l nitrogen) and 45 mg/l, which are the suggested nutrient and health hazard limits, respectively. For phosphate the suggested nutrient limit of 0.046 mg/l (equivalent to 0.015 mg/l phosphorus) was used.

The data on excessive nitrates ($\geq$ 1.33 and 45 mg/l) and phosphates ($\geq$ 0.046 mg/l) are perhaps more indicative of possible problems than of existing ones. Excessive nutrients are commonly associated with the eutrophication of lakes and reservoirs, whereas these data are for flowing streams. However, it is significant that in all the streams sampled excessive nitrate concentrations were observed for 62 to 99 percent of the time and excessive phosphates for 68 to 98 percent of the time. Hence, if artificial lakes or reservoirs are constructed in the future on any of those streams, there exists a strong possibility of accumulation of nutrients and the attendant eutrophication problems. Fortunately, only seven streams had nitrate concentrations equalling or exceeding 45 mg/l from 1 to 5 percent of the time, so that the possible hazard to health is a problem of lesser magnitude than that of the nutrients.

Also included in table 5 are the drainage area for each station and, where available, an estimate of the watershed population served by sewage treatment plants. These data, together with that shown in the station tabulations are useful in identifying to some extent the sources of nutrients in specific areas. As an example, the data for the Sangamon River at Monticello (see page 154) on April 4, 1960, show that the discharge was 1490 cfs and the nitrate concentration was 29.0 mg/l. Approximately 52,500 pounds of nitrate-nitrogen was carried in the stream

Table 5. Nutrient Concentrations, Watershed Area, and Sewered Population for 43 Sampling Stations

Sampling station	Map number (*Fig. 1*)	Sampling period	Nitrate (NO_3) Conc. (mg/l) not exceeded for given % of time 10%	50%	90%	% of time > given mg/l conc. 1.33	45	Phosphate (PO_4) Conc. (mg/l) not exceeded for given % of time 10%	50%	90%	% of time >given mg/l conc. 0.046	Drainage area (*sq mi*)	Approx. sewered population (1965)
Apple R.—Hanover	14	1957-61	1.9	5.2	8.4	94	0	0	0.25	0.4	85.7	244	3,600
Bay Cr.—Nebo	77	1961-66	1.3	4.4	11.9	90	0	0.1	0.3	1.7	93.4	162	4,090
Beaucoup Cr.—Matthews	93	1961-66	0.5	2.7	6.9	74	0	0	0.1	0.4	54.1	291	3,080
Big Cr.—Wetaug	95	1961-66	1.3	3.5	6.4	88	0	0	0.2	0.5	88.5	32.2	
Big Muddy R.—Murphysboro	107	1956-61	1.6	3.4	5.1	91	0	0	0.1	0.35	82.6	2,154	102,490
Blackberry Cr.—Yorkville	208	1961-66	2.2	5.9	20	92	2	0	0.2	0.5	82.0	69.4	
Blue Grass Cr.—Raymond	205	1961-66	5.4	14.0	30.8	98	2	0.2	0.6	2.0	98.1	17.2	
Bonpas Cr.—Browns	87	1961-66	1.7	4.6	11	90	0	0	0.2	0.6	79.2	228	1,920
Cache R.—Forman	96	1956-61	1.0	2.2	3.6	78	0	0.1	0.15	0.4	90.5	243	11,290
Coon Cr.—Riley	20	1961-66	1.5	6.0	23	92	0	0.1	0.25	0.9	95.1	82	1,340
Crab Orchard L.—Station 5	108	1956-61	0.6	2.5	6.8	79	0	0	0.1	0.3	71		
		1961-64	1.0	2.8	6.1	86	0	0	0.1	0.2	68		
Crane Cr.—Easton	70	1961-66	0.2	1.4	3.4	51	0	0	0.1	0.3	70.5	28.7	
Drowning Fork—Bushnell	206	1961-66	6.2	15	25	97	0	0.1	0.35	1.6	95.7	25.9	
Elkhorn Cr.—Penrose	22	1961-66	6.4	10.8	18.4	98	0	0.3	0.7	1.5	98.4	153	3,760
Embarras R.—Camargo	209	1961-66	3.2	17.7	41.0	99	5	0.1	0.4	1.9	94.8	185	3,940
Embarras R.—Ste. Marie	84	1956-61	1.1	5.7	16	88	0	0.2	0.3	0.7	95.2	1,513	45,380
Flat Br.—Taylorville	61	1961-66	1.7	8.4	19.3	91	0	0.3	0.6	1.3	96.5	279	12,670
Fox R.—Algonquin	2	1956-61	3.2	6.0	12.0	99	0	0.1	0.45	1.15	95.7	1,364	117,825
Fox R.—Dayton	30	1956-61	3.4	7.6	13.5	97	0	0.35	0.9	1.4	95.8	2,570	324,355
Hadley Cr.—Barry	75	1956-61	0.4	2.2	6.0	62	0	0	0.1	0.2	77.3	40.6	1,400
Hayes Cr.—Glendale	97	1961-66	0.36	2.1	4.5	68	0	0	0.1	0.4	70.8	18.9	
Illinois R.—Meredosia	104	1955-60	4.3	17	27	95	0					25,300	6,574,100
		1960-65	2.9	17.4	30.9	93	3						
Illinois R.—Peoria	102	1957-61	3.5	10.4	17.7	99	0	0.6	1.1	2.5	95.5	12,680	6,021,220
		1961-66	11.2	18.8	26.2	99	0	1.0	2.15	6.0	98.3		
Kankakee R.—Wilmington	32	1957-61	1.3	6.2	18	89	1	0.1	0.2	0.4	95.7	5,250	132,760
Kaskaskia R.—New Athens	81	1957-61	1.5	4.3	9.2	93	0	0.2	0.3	0.65	95.8	5,220	132,540
		1961-66	0.6	5.0	15.9	82	0	0.1	0.3	0.7	94.9		
Kaskaskia R.—Shelbyville	105	1956-61	0.45	8.2	23	93	0	0.15	0.4	0.7	95.8	1,030	23,790
		1961-66	1.1	12.9	34.9	88	1	0.2	0.3	0.8	98.3		
La Moine R.—Colmar	73	1957-61	1.5	3.5	11	91	0	0	0.2	0.4	78.3	655	24,700
Little Wabash R.—Carmi	89	1957-61	1.5	3.2	5.4	91	0	0.1	0.3	0.9	90.9	3,111	61,040
Mississippi R.—Chester	112	1955-60	1.5	6.8	18	91	2					712,600	
		1960-65	1.6	9.4	22.1	92	0						
Mississippi R.—E. St. Louis	111	1958-61	2.4	6.0	11	96	0	0.2	0.4	1.3	95.7	701,000	
		1961-66	4.2	8.2	14	99	0	0.15	0.5	1.15	92.9		
North Fork Embarras—Oblong	85	1961-66	0.4	8.5	9	78	0	0.1	0.3	1.1	90	319	4,050
Ohio R.—Cairo	114	1958-61	1.6	3.8	6.6	92	0	0	0.1	0.2	82.6	203,900	
		1961-66	2.1	4.3	8.0	99	0	0	0.1	0.9	85.2		
Otter Cr.—Palmyra	203	1961-66	2.2	7.8	15	93	0	0.2	0.5	1.4	97.8	61.6	
Rock R.—Como	23	1956-61	2.2	6.4	12	96	0	0.3	0.7	0.95	95.7	8,700	611,700
		1961-66	4.6	9.6	17.8	99	0	0.5	0.9	1.8	96.7		
Sangamon R.—Monticello	60	1956-61	2.4	8.7	26	96	0	0.2	0.3	1.25	95.7	550	8,120
Sangamon R.—Oakford	71	1956-61	1.5	5	13.5	91	0	0.3	0.6	1.85	95.7	5,120	408,650
Seven Mile Cr.—Mt. Vernon	207	1961-66	0.6	2.4	4.8	70	0	0	0.1	0.65		21.5	
Skillet Fork—Wayne City	88	1957-61	1.1	2.5	4	80	0	0	0.1	0.2	71.4	464	1,200
Spoon R.—London Mills	49	1957-61	1.3	6.5	10.5	89	0	0.1	0.2	0.4	95.7	1,070	27,720
Vermilion R.—Lowell	39	1957-61	2.8	11	27	98	4	0.6	1.35	15	95.7	1,230	34,220
Vermilion R.—Pontiac	38	1957-61	1.8	9.0	28	92	2	0	0.2	0.3	85.7	568	14,220
Wabash R.—Riverton, Ind.	117	1955-60	3.5	11.5	26	95	3					13,100	
		1962-66	1.4	10.8	29.7	90	2						
Wolf Cr.—Beecher City	201	1961-66	0.8	3.3	9.6	85	0	0.1	0.3	0.6	92.6	48	

on that day, at this sampling point. If the tributary sewered population at that time was 8120, and the daily per capita production of total nitrogen was 0.03 pound, then 244 pounds of nitrogen can be attributed to sewage effluents. This leaves a residual of 52,256 pounds per day (as N). Dividing this residual by the drainage area above the sampling station (550 square miles, 352,000 acres) gives 0.148 pound nitrogen per acre per day in the runoff from the total land surface. If it is assumed that 85 percent of the drainage area may have been in cultivation, the nitrogen in runoff approaches 0.175 pound per acre per day.

Caution should be used in attempting to establish the relative amounts of nutrients entering surface waters from the various sources, since each watershed is apt to be unique in the amount of cultivated land that it drains, in the sewered population it serves, in the amount of runoff from the watershed, or in the base flow of groundwater into its streams.

Temperature

The temperature characteristic of surface water has been included because of its particular interest to industry in the use of water for cooling without prior treatment. Temperature significantly affects the quality of water and the uses of it. Each use, and the ability of streams to purify themselves, may require a distinct range of water temperatures. Temperature data presented in this bulletin are for samples taken at approximately monthly intervals, and therefore are representative only insofar as they fall within the ranges of high and low temperatures observed in a previous study of surface water temperatures.[11] During the sampling periods covered in this bulletin observed stream temperatures have either reached or exceeded 90 F (the SWB criteria value) only nine times, and in seven streams. Maximum observed temperature was 93 F in the Kaskaskia River. Three of the high temperatures were observed during the month of July and the others in August.

Manganese and Iron

Manganese and iron in surface waters are determined on unfiltered samples, and the results of these determinations therefore represent the total in the sample including that which may be carried into surface waters by the clay or soil turbidity in surface runoff.

For surface water supplies, manganese and iron are usually removed by the treatment processes for turbidity removal. The *Public Health Service Drinking Water Standards* recommends that the limit for the concentration of manganese in finished waters be held to 0.05 mg/l, and that the concentration of iron be limited to 0.3 mg/l. The principal reasons for these limiting concentrations are the limits established for water quality control and the reduction of aesthetic and economic problems.

RADIOACTIVITY DATA

Samples of surface water from 41 sampling locations were analyzed for radioactivity during two 5-year periods between 1957 and 1966. The three locations of this study not included are the Illinois River at Meredosia, the Mississippi River at Chester, and the Wabash River at Riverton, Indiana.

Samples were filtered and gross alpha (α) and beta (β) activity were determined on the suspended and dissolved fractions of each sample. Results are given in pico curies per liter (pc/l) .

The highest average annual radioactivity was found during the early years of the sampling program; then radioactivity generally declined through 1960 and 1961. In 1962 and 1963 there was another increase in radioactivity followed by a decline extending from 1964 through 1966.

During the entire 10-year period, the *Public Health Service Drinking Water Standards* for radioactivity were exceeded on eight occasions, in samples from eight different locations. These results are listed in table 6.

In summary it can be said that during the entire 10-year sampling period there were two relatively short periods during which radioactivity in surface water reached peaks, but there was no consistent pattern for the occurrence or reoccurrence of peak radioactivity in any particular stream. Near the end of the sampling period, radioactivity was relatively low and very generally distributed throughout the state. Average annual radioactivity for all streams sampled is shown in figures 4 through 8 for the years 1957 through 1966, respectively. Summaries of radioactivity for the entire period are given in table 7.

Table 6. Excessive Radioactivity in Surface Water

Sampling location	Date	Sample fraction	Gross α plus β (*pc/l*)
Skillet Fork at Wayne City	Jul 1957	Suspended	1938
Hadley Creek near Barry	Jul 1958	Dissolved	3460
Crab Orchard Lake at Station 5	Aug 1958	Dissolved	2760
Illinois River at Peoria	Aug 1958	Dissolved	1571
Cache River at Forman	Sep 1958	Suspended	1072
Fox River at Dayton	Mar 1959	Dissolved	1860
Vermilion River at Lowell	Mar 1959	Dissolved	1260
Crane Creek near Easton	Mar 1963	Suspended	1027

Table 7. Radioactivity Data for 41 Stations

Sample fraction	Year	Number of samples analyzed	Annual average radioactivity (*pc/l*)	Maximum observed radioactivity (*pc/l*)	(*month*)
Apple River near Hanover					
Suspended	1957	4	11	28	Sep
	1958	10	8	29	Jun
	1959	12	36	261	Mar
	1960	12	2		
	1961	8	1		
Dissolved	1957	4	22	53	Dec
	1958	10	51	253	Aug
	1959	12	46	185	Mar
	1960	12	9	22	Mar
	1961	8	16	56	Feb
Bay Creek at Nebo					
Suspended	1961	3	11		
	1962	12	37	319	Mar
	1963	12	75	115	Feb
	1964	12	14	76	Mar
	1965	12	10	44	Jun
	1966	8	69	290	Apr
Dissolved	1961	3	26	30	Dec
	1962	12	24	78	Mar
	1963	12	33	24	Jul
	1964	12	16	24	Jul
	1965	12	15	27	Apr
	1966	9	14	38	May
Beaucoup Creek near Matthews					
Suspended	1961	3	33	67	Nov
	1962	12	48	418	Jan
	1963	12	29	90	May
	1964	12	12	57	Mar
	1965	12	4		
	1966	6	9	31	Mar
Dissolved	1961	3	41	57	Nov
	1962	12	67	228	Jan
	1963	12	56	91	Jun
	1964	12	33	45	Nov
	1965	12	20	45	Jun
	1966	6	27	37	Mar
Big Creek near Wetaug					
Suspended	1961	3	84	124	Nov
	1962	12	45	266	Oct
	1963	12	47	343	Mar
	1964	12	16	47	Jul
	1965	12	20	72	Aug
	1966	9	40	172	May
Dissolved	1961	3	33	51	Dec
	1962	12	26	32	Apr
	1963	12	34	107	Mar
	1964	12	15	27	Jul

Table 7 (Continued)

Sample fraction	Year	Number of samples analyzed	Annual average radioactivity (*pc/l*)	Maximum observed radioactivity (*pc/l*)	(*month*)
	1965	12	11		
	1966	9	11	23	Mar
Big Muddy River at Murphysboro					
Suspended	1957	8	18	59	May
	1958	12	65	284	Jul
	1959	12	57	334	Jan
	1960	12	18	93	Jun
	1961	9	9	29	Feb
Dissolved	1957	8	26	63	Jul
	1958	12	45	126	Sep
	1959	12	60	231	Jan
	1960	12	16	25	Oct
	1961	9	12	34	Jan
Blackberry Creek near Yorkville					
Suspended	1961	3	7		
	1962	12	33	60	May
	1963	12	31	333	Mar
	1964	12	7	30	Jun
	1965	12	5		
	1966	9	3		
Dissolved	1961	3	5		
	1962	12	25	79	Feb
	1963	12	36	223	Mar
	1964	12	11	21	Jun
	1965	12	14	45	Aug
	1966	9	12		
Blue Grass Creek near Raymond					
Suspended	1961	3	22	66	Dec
	1962	12	14	71	Mar
	1963	11	30	94	Feb
	1964	7	16	28	May
	1965	11	38	316	Sep
	1966	8	43	134	Aug
Dissolved	1961	3	12	20	Dec
	1962	12	24	50	Oct
	1963	11	41	101	Mar
	1964	7	16		
	1965	11	12	21	Jan
	1966	8	13	25	Jul
Bonpas Creek at Browns					
Suspended	1961	1	76	76	Dec
	1962	9	131	546	Jan
	1963	9	117	260	Apr
	1964	8	22	44	Jun
	1965	12	10	22	Aug
	1966	8	11	26	Feb
Dissolved	1961	1	71	71	Dec
	1962	9	66	123	Nov
	1963	9	91	152	Apr
	1964	8	45	111	Jan
	1965	12	23	45	Feb & Aug
	1966	8	18	30	Jul
Cache River at Forman					
Suspended	1957	9	54	175	Aug
	1958	12	128	1072	Sep
	1959	11	59	265	Jan
	1960	11	11	34	Jan
	1961	7	5		
Dissolved	1957	9	18	34	Sep
	1958	12	56	204	Jul
	1959	11	61	265	Jan
	1960	12	10		
	1961	7	14	24	Jan
Coon Creek at Riley					
Suspended	1961	3	5		
	1962	12	16	80	Mar
	1963	12	15	57	Apr
	1964	12	4		
	1965	13	5	31	Feb
	1966	9	4		
Dissolved	1961	3	10	36	Dec
	1962	12	27	77	Mar
	1963	12	30	114	Mar
	1964	12	11	32	Mar
	1965	13	9		
	1966	9	13	27	Apr
Crab Orchard Lake at Station 5					
Suspended	1957	8	17	50	Jul
	1958	12	55	337	Jan
	1959	12	9	34	Mar
	1960	11	1		
	1961	11	3		
	1962	12	54	363	Jan
	1963	12	14	49	Mar
	1964	6	13	26	Apr
Dissolved	1957	8	17	25	Aug
	1958	12	259	2760	Aug
	1959	12	27	52	Feb
	1960	11	12	34	Dec
	1961	11	12	43	Feb
	1962	12	43	129	Jan
	1963	12	30	60	Feb
	1964	6	15		
Crab Orchard Lake at Wolf Creek Bridge					
Suspended	1957	9	16	67	Jul
	1958	13	26	54	Jan
	1959	12	30	95	Feb
	1960	11	4		
	1961	12	12	63	Oct
	1962	12	59	200	Feb
	1963	12	55	489	Mar
	1964	6	18	55	Mar
Dissolved	1957	9	19	36	Aug
	1958	13	27	83	Aug
	1959	12	73	350	Apr
	1960	11	15	166	Dec
	1961	12	10	42	Dec
	1962	12	50	156	Mar
	1963	12	39	119	Mar
	1964	6	20	25	Apr
Crane Creek near Easton					
Suspended	1961	3	3		
	1962	12	4		
	1963	12	88	1027	Mar
	1964	12	2		
	1965	12	5	35	Apr
	1966	9	2		
Dissolved	1961	3	31	66	Oct
	1962	12	10	23	Oct
	1963	12	46	417	Mar
	1964	12	5		
	1965	12	6		
	1966	9	5		
Drowning Fork at Bushnell					
Suspended	1961	3	7		
	1962	10	10	28	Feb
	1963	8	28	68	Aug
	1964	5	3		

Table 7 (Continued)

Sample fraction	Year	Number of samples analyzed	Annual average radioactivity (pc/l)	Maximum observed radioactivity (pc/l)	(month)
	1965	11	3		
	1966	8	6		
Dissolved	1961	3	1		
	1962	10	25	72	Sep
	1963	8	42	66	Apr & Aug
	1964	5	10		
	1965	11	4		
	1966	8	9	22	Mar
Elkhorn Creek near Penrose					
Suspended	1961	3	68	164	Nov
	1962	12	10	23	May
	1963	12	17	94	Mar
	1964	12	16	129	Mar
	1965	13	21	134	Sep
	1966	9	55	473	Jun
Dissolved	1961	3	32	43	Dec
	1962	12	19	63	Jan
	1963	12	34	180	Mar
	1964	12	11	33	Mar
	1965	13	10	20	Mar
	1966	9	9		
Embarras River near Camargo					
Suspended	1961	3	10	21	Nov
	1962	12	37	252	Jan
	1963	12	30	122	Jun
	1964	10	7		
	1965	12	4		
	1966	9	8	34	May
Dissolved	1961	3	17	22	Nov
	1962	12	26	88	Jan
	1963	12	32	76	Feb
	1964	10	11	29	Jan
	1965	12	11	35	Aug
	1966	9	9	24	Jun
Embarras River at Ste. Marie					
Suspended	1957	8	224	227	Dec
	1958	12	25	83	Jul
	1959	12	27	108	Jan
	1960	12	11	93	Jun
	1961	8	9	44	Mar
Dissolved	1957	8	28	90	Jul
	1958	12	75	682	Aug
	1959	12	28	83	Jan
	1960	12	7	23	May
	1961	8	15	52	Feb
Flat Branch near Taylorville					
Suspended	1961	3	14	24	Dec
	1962	12	28	117	Jun
	1963	12	57	222	Jun
	1964	8	15	78	Apr
	1965	12	13	79	Jun
	1966	9	65	473	May
Dissolved	1961	3	14	22	Nov
	1962	12	26	50	Oct
	1963	12	47	112	Apr
	1964	8	19	40	Apr
	1965	12	14	28	Jan
	1966	9	11	26	May
Fox River at Algonquin					
Suspended	1957	8	8	29	Aug
	1958	12	12	25	Jun
	1959	12	17	77	Mar
	1960	12	4		
	1961	10	3		
Dissolved	1957	8	19	31	May
	1958	12	92	756	Aug
	1959	12	75	367	Jan
	1960	12	11	30	Nov
	1961	10	11	26	Jan
Fox River at Dayton					
Suspended	1957	10	30	152	Jul
	1958	12	17	48	Aug
	1959	11	50	369	Feb
	1960	12	5	20	Jan
	1961	10	4		
Dissolved	1957	10	26	53	Aug
	1958	12	30	127	Aug
	1959	11	217	1860	Mar
	1960	12	12	29	Nov
	1961	10	10	43	Feb
Hadley Creek near Barry					
Suspended	1957	8	28	103	Aug
	1958	12	27	104	Apr
	1959	12	22	103	Feb
	1960	12	4		
	1961	9	3		
Dissolved	1957	8	21	33	Oct
	1958	12	307	3460	Jul
	1959	12	19	43	May
	1960	12	11	28	Nov
	1961	9	10	20	Mar
Hayes Creek at Glendale					
Suspended	1961	2	7		
	1962	10	15	59	Jul
	1963	8	18	31	Jan
	1964	8	10		
	1965	12	6		
	1966	7	5		
Dissolved	1961	2	22	30	Nov
	1962	10	29	89	Jan
	1963	8	28	38	Mar
	1964	8	12	21	Jul
	1965	12	7		
	1966	7	10		
Illinois River at Peoria					
Suspended	1958	38	21	69	Aug
	1959	96	26	206	Feb
	1960	4	6		
	1961	12	4		
	1962	11	20	97	Mar
	1963	10	17	59	Apr
	1964	12	8		
	1965	11	15	57	Mar
	1966	9	9	24	Mar
Dissolved	1958	38	142	1571	Aug
	1959	96	39	312	Mar
	1960	4	20	34	Sep
	1961	12	11	24	Nov
	1962	11	47	267	Mar
	1963	10	34	78	Apr
	1964	12	21	33	May
	1965	11	12	20	Feb & Apr
	1966	9	17	28	Aug
Kankakee River near Wilmington					
Suspended	1957	7	25	117	Jul
	1958	12	29	171	Dec
	1959	12	22	141	Feb
	1960	12	7	27	Jun
	1961	9	6	37	Sep

Table 7 (Continued)

Sample fraction	Year	Number of samples analyzed	Annual average radioactivity (*pc/l*)	Maximum observed radioactivity (*pc/l*)	(*month*)
Dissolved	1957	7	14	49	Aug
	1958	12	27	123	Aug
	1959	12	25	121	Feb
	1960	12	12	29	Jan
	1961	9	10	29	Sep
Kaskaskia River at New Athens					
Suspended	1957	7	60	286	Jul
	1958	12	47	120	Jul
	1959	12	89	296	Mar
	1960	12	13	30	Jun
	1961	12	20	103	Jun
	1962	12	109	433	Jan
	1963	12	62	343	Mar
	1964	12	34	265	Mar
	1965	12	13	34	Jun & Sep
	1966	9	12	39	Jun
Dissolved	1957	7	24	86	Jul
	1958	12	43	220	Jul
	1959	12	46	275	Apr
	1960	12	16	40	Dec
	1961	12	10	35	Nov
	1962	12	47	133	Jan
	1963	12	43	121	Mar
	1964	12	21	39	May
	1965	12	16	41	May
	1966	9	17	30	May
Kaskaskia River at Shelbyville					
Suspended	1957	6	22	94	Sep
	1958	10	36	172	Feb
	1959	12	47	322	Feb
	1960	12	8	39	Jun
	1961	12	34	285	Dec
	1962	12	84	837	Mar
	1963	11	34	188	Mar
	1964	6	7		
	1965	6	5		
	1966	7	18	48	Mar
Dissolved	1957	6	12	22	Sep
	1958	10	22	68	Jul
	1959	12	22	84	Feb
	1960	12	6		
	1961	12	10	27	Nov
	1962	12	40	157	Mar
	1963	11	39	125	Mar
	1964	6	12		
	1965	6	10	31	Aug
	1966	7	12	20	May
La Moine River at Colmar					
Suspended	1957	5	26	68	Aug
	1958	11	52	344	Jul
	1959	12	37	208	Feb
	1960	12	26	106	Jun
	1961	9	11	35	May
Dissolved	1957	5	25	35	May
	1958	11	32	167	Jul
	1959	12	22	75	Feb
	1960	12	13	21	Jun & Oct
	1961	9	4		
Little Wabash River at Carmi					
Suspended	1957	6	96	282	Aug
	1958	12	87	313	Jul
	1959	12	83	310	Mar
	1960	12	10	26	Feb
	1961	8	3		
Dissolved	1957	6	26	52	Aug
	1958	12	48	127	Jul
	1959	12	80	273	Jan
	1960	12	17	29	Oct
	1961	8	9		
Mississippi River at East St. Louis					
Suspended	1958	7	29	66	Jul
	1959	11	43	167	Mar
	1960	10	11	34	Apr
	1961	12	6		
	1962	10	37	194	Mar
	1963	12	39	219	Mar
	1964	12	28	100	Apr & Jul
	1965	11	19	83	Apr
	1966	8	19	67	Apr
Dissolved	1958	7	22	22	Jul
	1959	11	80	614	Mar
	1960	10	8		
	1961	12	12	37	Dec
	1962	10	37	84	Mar
	1963	12	40	76	Mar
	1964	12	20	32	Jul
	1965	11	17	35	Aug
	1966	8	13	20	Jun
North Fork Embarras River near Oblong					
Suspended	1961	3	32	69	Dec
	1962	12	46	211	Apr
	1963	12	31	77	Mar
	1964	12	10	35	Jan
	1965	11	9	35	Sep
	1966	9	10	32	May
Dissolved	1961	3	49	50	Nov
	1962	12	63	198	Jan
	1963	12	54	70	Feb & Aug
	1964	12	22	37	Jan
	1965	11	15	32	Jan
	1966	9	18	30	Mar & May
Ohio River at Cairo					
Suspended	1958	9	36	101	Jul
	1959	11	46	506	Feb
	1960	12	4		
	1961	12	10	62	Dec
	1962	11	33	105	Nov
	1963	12	71	409	Mar
	1964	13	17	42	Jan
	1965	12	13	54	Feb
	1966	10	15	93	May
Dissolved	1958	9	51	293	May
	1959	11	30	82	Apr
	1960	12	8	26	Oct
	1961	12	10	26	Nov
	1962	11	23	47	Mar
	1963	12	29	70	May
	1964	13	15	24	Feb
	1965	12	12	34	May
	1966	10	13	26	May
Otter Creek near Palmyra					
Suspended	1961	3	7		
	1962	8	14	505	Mar
	1963	10	13	591	Jul
	1964	7	8		
	1965	11	5		
	1966	6	16	81	May

Table 7 (Concluded)

Sample fraction	Year	Number of samples analyzed	Annual average radioactivity (*pc/l*)	Maximum observed radioactivity (*pc/l*)	(*month*)
Dissolved	1961	3	20	25	Dec
	1962	8	62	117	Jan
	1963	10	81	212	Feb
	1964	7	24	38	Jan
	1965	11	22	41	May
	1966	6	21	51	May
Rock River at Como					
Suspended	1957	7	13	35	Jul
	1958	11	9		
	1959	12	37	293	Mar
	1960	12	8	48	Jan
	1961	12	19	144	Nov
	1962	12	16	47	May
	1963	12	32	209	Mar
	1964	12	13	56	Jan
	1965	13	10	25	Apr
	1966	9	5		
Dissolved	1957	7	11		
	1958	11	33	163	Jul
	1959	12	39	157	Mar
	1960	12	8		
	1961	12	14	43	Dec
	1962	12	32	124	Feb
	1963	12	53	332	Mar
	1964	12	13	35	Mar
	1965	13	15	28	Apr
	1966	9	14	37	Apr
Sangamon River at Monticello					
Suspended	1957	6	19	67	May
	1958	13	25	128	Aug
	1959	12	67	646	Feb
	1960	14	5	20	Sep
	1961	9	3		
Dissolved	1957	6	16	27	May
	1958	13	39	205	Aug
	1959	12	37	167	Feb
	1960	14	10	24	Dec
	1961	9	6		
Sangamon River near Oakford					
Suspended	1957	7	17	44	Jun
	1958	12	20	77	Jun
	1959	12	25	150	Feb
	1960	13	8	34	Jul
	1961	9	4		
Dissolved	1957	7	7		
	1958	12	42	196	Aug
	1959	12	19	35	Feb
	1960	13	12	26	Mar
	1961	9	6		
Seven Mile Creek near Mt. Vernon					
Suspended	1961	2	15	25	Dec
	1962	10	58	190	Jan
	1963	9	70	272	Jun
	1964	8	27	66	Jul
	1965	9	6	23	Dec
	1966	6	24	93	Apr
Dissolved	1961	2	28	52	Nov
	1962	10	50	124	Jan
	1963	9	48	126	Jun
	1964	8	27	50	May
	1965	9	14	23	Feb
	1966	6	18	22	Mar
Skillet Fork at Wayne City					
Suspended	1957	7	369	1938	Jul
	1958	12	51	248	Jul
	1959	12	42	259	Feb
	1960	12	7	35	Jul
	1961	8	3		
Dissolved	1957	7	40	99	Jul
	1958	12	34	104	Jul
	1959	12	44	122	May
	1960	12	12	25	Feb
	1961	8	20	78	Feb
Spoon River at London Mills					
Suspended	1957	5	27	60	Oct
	1958	10	31	226	Feb
	1959	11	40	233	Feb
	1960	12	14	87	Jun
	1961	7	7		
Dissolved	1957	5	9	26	Dec
	1958	10	22	51	Aug
	1959	11	49	154	Jan
	1960	12	8	28	Dec
	1961	7	16	27	Feb & Sep
Vermilion River at Lowell					
Suspended	1957	8	127	919	Jul
	1958	11	20	100	Jun
	1959	11	33	272	Feb
	1960	11	4		
	1961	10	3		
Dissolved	1957	8	19	80	Jul
	1958	11	29	55	Oct
	1959	11	146	1260	Mar
	1960	11	15	53	Nov
	1961	10	9	26	Sep
Vermilion River at Pontiac					
Suspended	1957	7	12	37	Jul
	1958	12	18	64	Jun
	1959	12	19	104	Feb
	1960	12	16	66	Feb
	1961	8	8	30	Mar
Dissolved	1957	7	13	28	Oct
	1958	12	52	406	Aug
	1959	12	39	204	May
	1960	12	12	23	May
	1961	8	10	30	Mar
Wolf Creek near Beecher City					
Suspended	1961	3	18	29	Nov
	1962	12	33	107	Jan
	1963	11	63	307	Jun
	1964	7	19	68	Mar
	1965	12	13	89	Apr
	1966	7	5		
Dissolved	1961	3	30	55	Nov
	1962	12	64	117	Jan
	1963	11	87	165	Aug
	1964	7	39	63	Nov
	1965	12	19	54	Jun
	1966	7	16	29	Jul

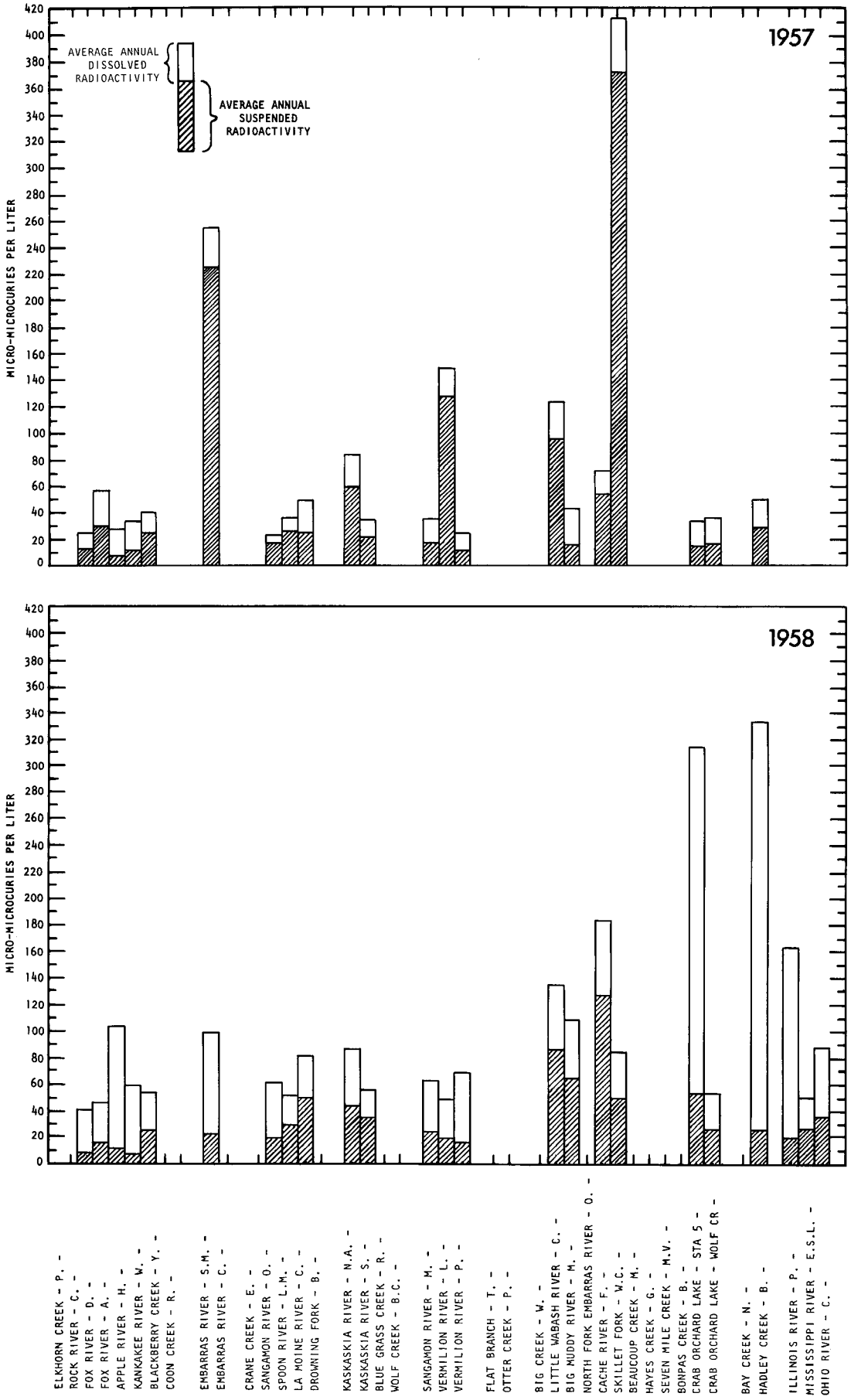


Figure 4. Average annual radioactivity, 1957-1958

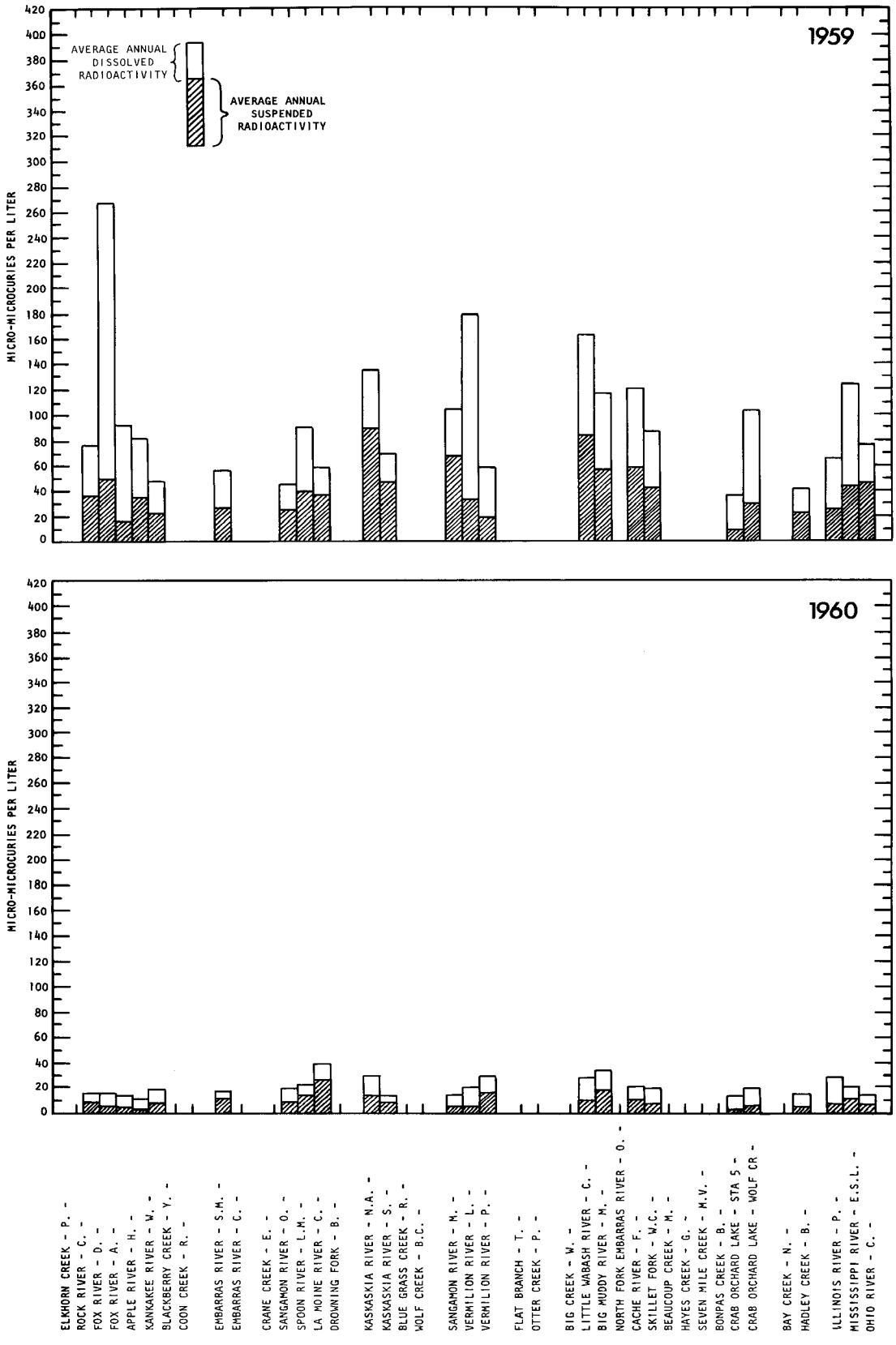


Figure 5. Average annual radioactivity, 1959-1960

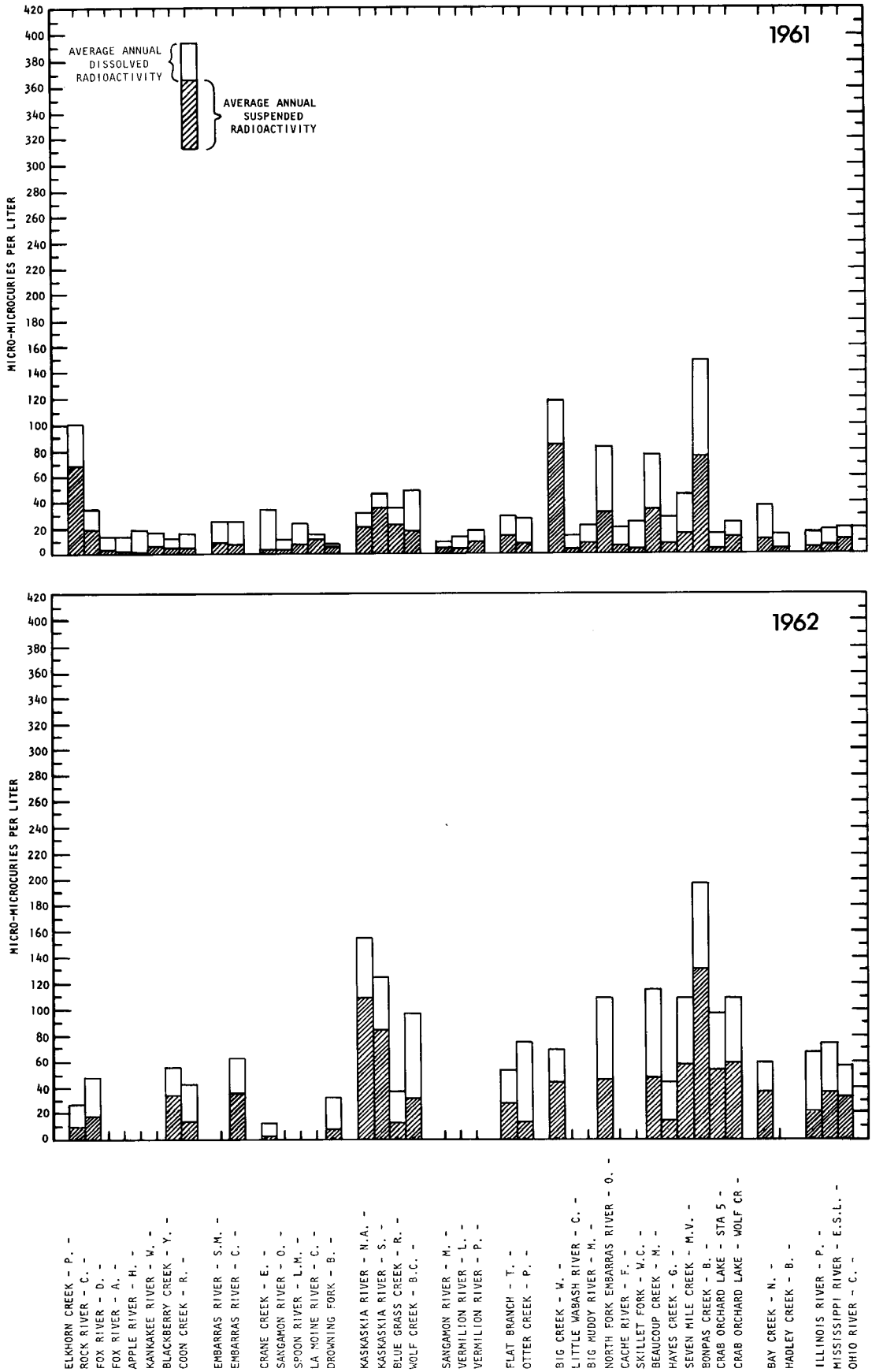


Figure 6. Average annual radioactivity, 1961-1962

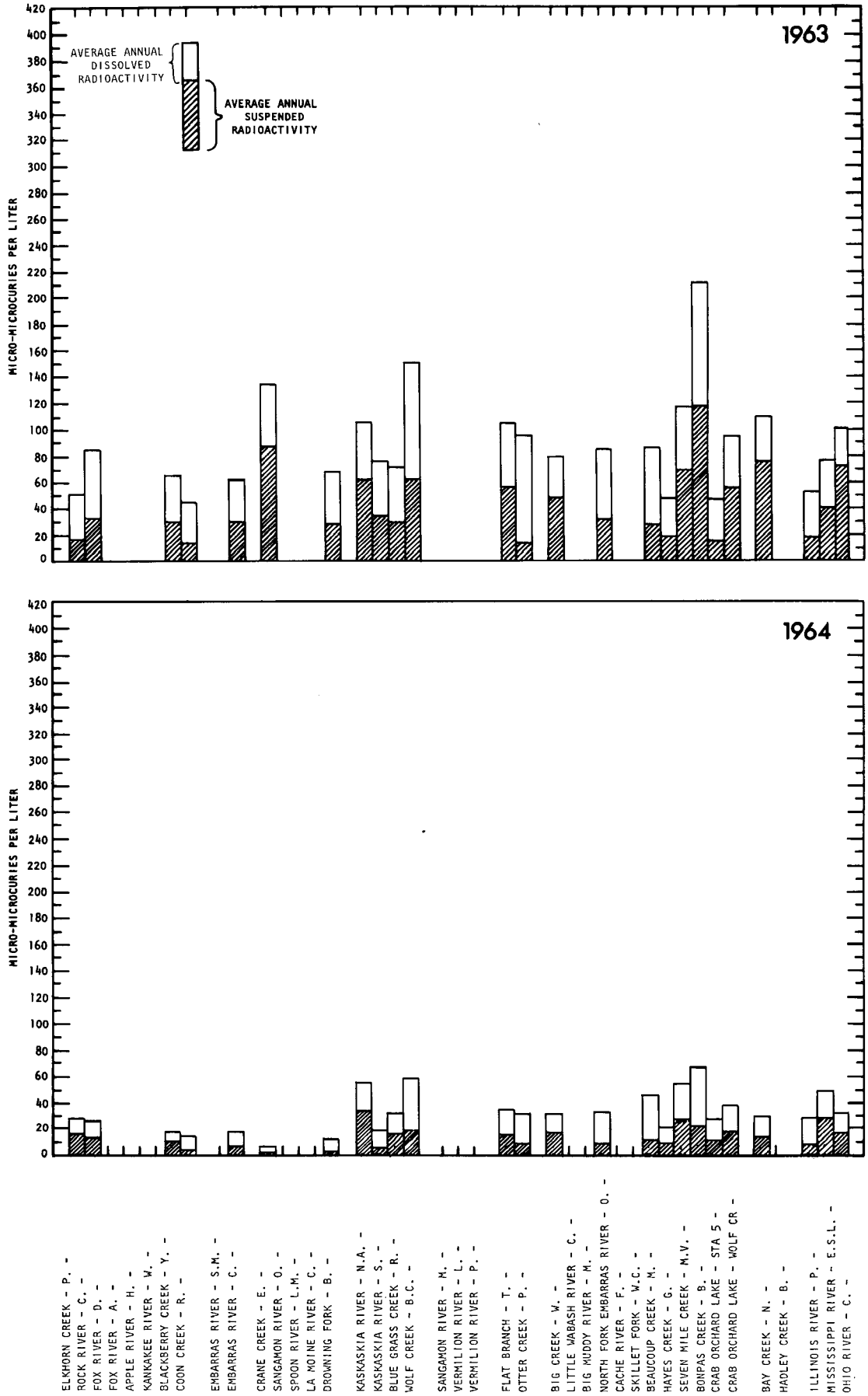


Figure 7. Average annual radioactivity, 1963-1964

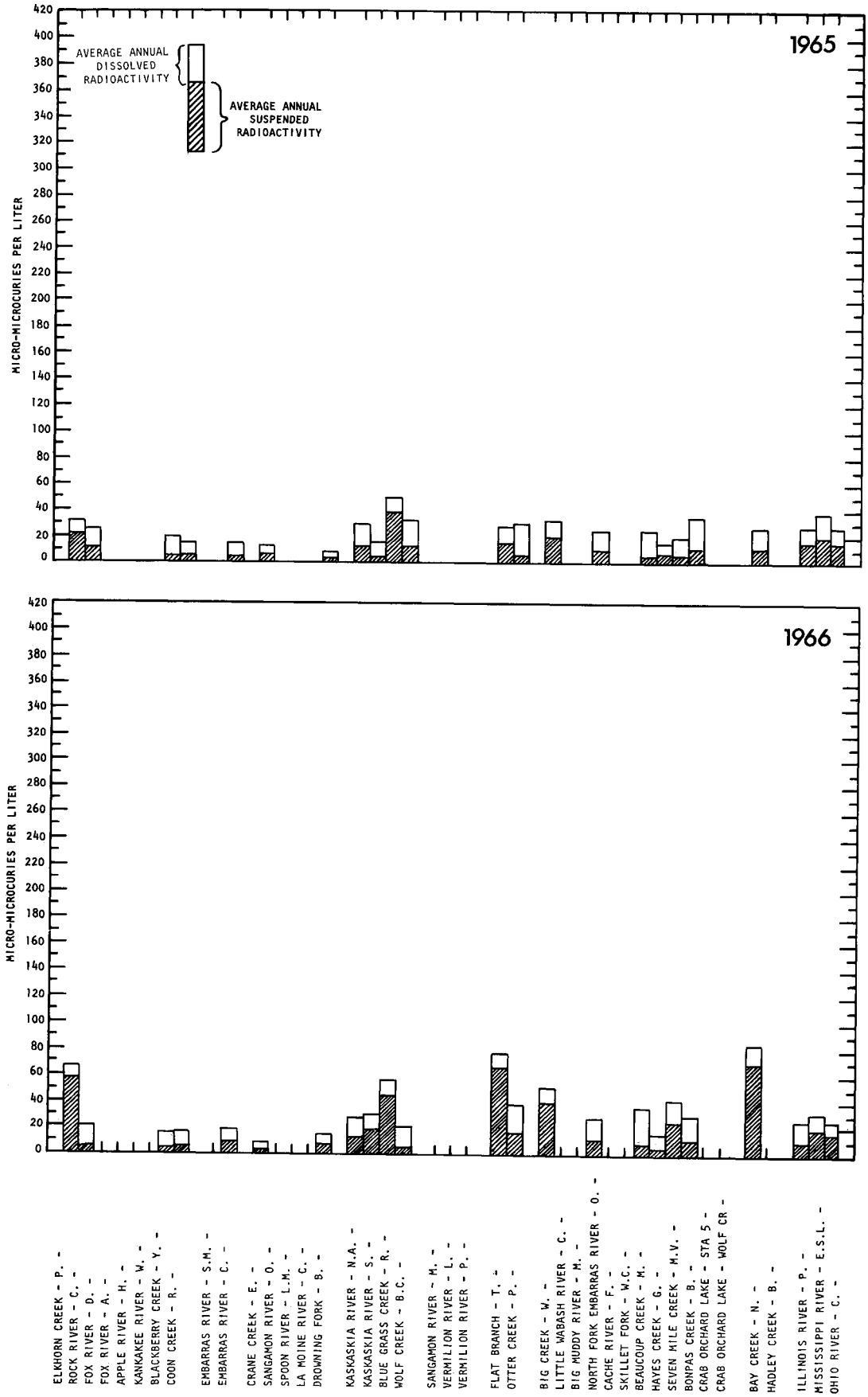


Figure 8. Average annual radioactivity, 1965-1966

DATA SUMMARIES

Data for each of the 44 sampling stations are presented on the following pages and include descriptions of the sampling location and watershed area. The physiographic regions are those set forth by the State Geological Survey.[5] Results of statistical analyses of discharge and quality data are summarized and depicted graphically. Tabulations of individual determinations for each year of the collection period are provided. Flow data are from the records of the U. S. Geological Survey.[12-14] Deviations from normal rainfall for periods of collection were obtained from available records of U. S. Weather Bureau[15] stations; no attempt was made to provide rainfall data for the large intersectional streams.

These summaries are arranged in alphabetical order by stream names and by station names on the same stream.

APPLE RIVER NEAR HANOVER

The Apple River rises in the Wisconsin Driftless Region northwest of Stockton and flows generally southward to its confluence with the Mississippi River above Savanna. The gaging station at Hanover is 12 miles upstream from the mouth, and the elevation of the gage datum is 591.00 feet above mean sea level, adjustment of 1912. The drainage basin above the gage has an area of 244 square miles.

The tabulation of water quality data is for the period from June 27, 1957, to September 20, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were very close to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 15.26 inches above normal to 5.3 inches below normal, based on records for one station. The average annual departure was +6.52 inches.

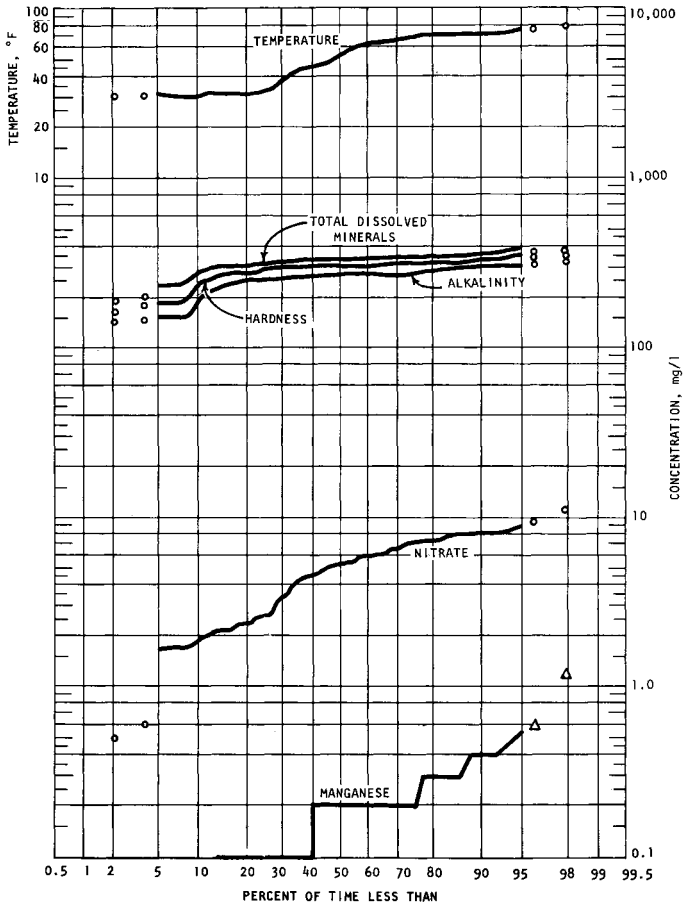
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.5 cfs/sq mi and was not less than 0.1 cfs/sq mi, with a median flow of 0.313 cfs/sq mi. The minimum average daily flow of record was 4.5 cfs in July 1953.

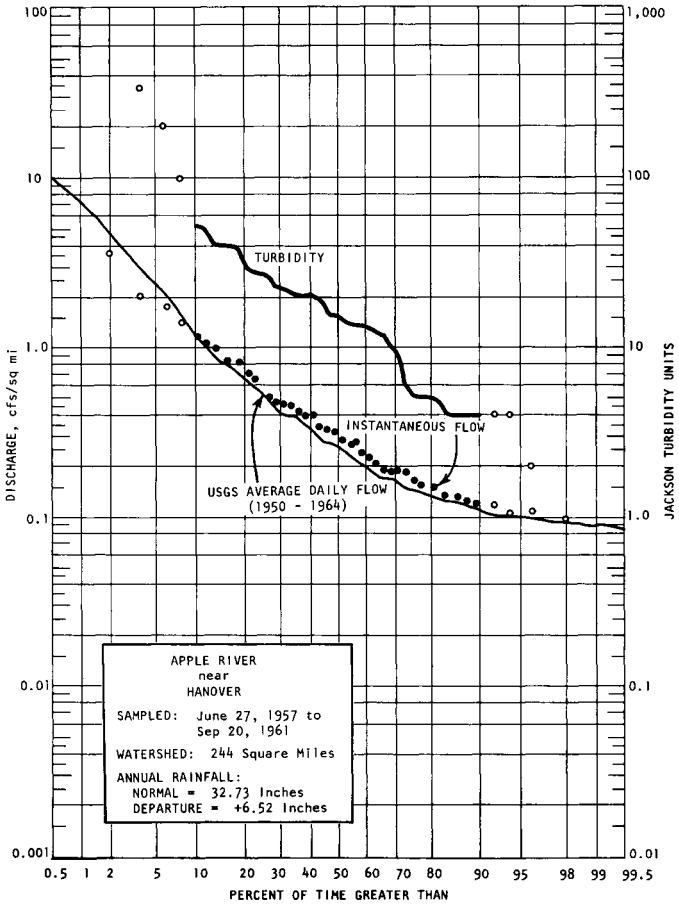
The turbidity was not less than 4 Jtu nor more than 55 Jtu for the central 80 percent of the time, with a median value of 15 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 30 percent of the time. They were below 50 F for 45 percent and below 40 F for 30 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	210	290	315
Hardness (as $CaCO_3$)	260	320	340
Total dissolved minerals	300	340	370
Nitrate	1.9	5.2	8.4
Manganese	T	0.2	0.4





Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-27	70.0	143773	70	41	1.9	0.4	0.2	T	7.9	7	41.1	5.5	T	68.5	40.3	2	284	337	349	
8-30	86.0	144389	74	21	1.3	0.2	0.1	0.0	7.3	8	24.9	4.6	0.1	63.7	37.3	8	289	313	346	
11-1	28.0	144899	48	16	1.0	0.2	0.1	0.1	6.4	7	28.9	2.6	0.0	68.2	41.9	1	304	344	343	
12-11	24.0	145259	33	4	0.3	0.1	0.3	0.1	7.4	8	31.3	4.6	0.0	65.5	43.1	9	312	341	353	
1958																				
1-10	41.0	145450	32	0	0.3	0.1	0.1	0.1	8.8	8	36.8	6.0	T	74.5	42.9	6	320	363	384	
2-6	38.0	145662	33	2	0.2	0.1	0.1	0.0	9.3	7	29.8	4.8	T	69.0	41.5	8	316	343	357	
3-12	68.0	146023	41	5	0.5	0.2	0.1	0.0	8.6	7	33.1	3.3	T	68.0	37.1	2	280	323	352	
4-15	106.0	146330	59	40	2.4	0.3	0.1	0.0	5.0	7	38.5	3.5	T	66.2	38.5	1	272	324	352	
5-16	46.0	146630	67	21	0.4	0.2	0.1	0.0	6.7	6	33.9	2.0	T	64.8	41.2	1	288	332	333	
6-25	55.0	146990	70	52	2.4	0.3	0.1	0.0	8.7	6	32.9	5.2	0.1	72.1	37.3	14	318	334	355	
8-1	33.0	147393	76	15	0.6	0.6	0.2	0.1	6.3	5	29.2	1.7	T	62.9	41.2	4	296	327	333	
9-4	28.0	147602	74	6	0.4	0.3	0.1	0.1	20.6	6	26.5	0.5	T	61.2	39.2	3	284	314	349	
11-6	30.0	148152	47	13	1.1	0.2	0.2	0.1	6.6	6	27.6	1.7	T	58.9	40.0	3	280	312	333	
12-12	34.0	148384	32	4	0.4	0.2	0.1	0.0	10.0	7	32.7	0.6	T	72.3	47.1	4	340	375	378	
1959																				
1-14	31.0	148672	32	15	1.7	0.2	0.1	0.0	13.1	9	31.3	8.3	T	64.5	31.7	37	224	292	349	
2-11	37.0	148827	32	4	0.5	0.2	0.1	0.0	9.6	5	24.9	2.7	T	73.1	35.5	10	316	349	379	
3-19	875.0	149095	35	200	19.	1.2	0.1	0.0	7.1	4	19.5	5.0	T	41.1	19.7	1	156	184	212	
4-22	114.0	149374	52	54	7.1	0.2	0.1	0.0	5.4	11	37.2	7.5	0.1	45.6	18.7	8	148	191	241	
5-19	239.0	149639	64	43	2.6	0.4	0.1	0.1	3.2	8	33.5	2.1	T	61.5	38.4	8	280	312	329	
6-24	47.0	149927	72	22	1.2	0.3	0.1	0.0	5.9	8	30.9	2.4	T	65.9	39.9	6	296	329	346	
7-30	52.0	150264	80	13	0.6	0.2	0.1	0.0	9.7	6	29.4	4.3	T	58.1	34.2	4	252	286	302	
8-26	47.0	150451	83	10	2.5	0.3	0.1	0.0	6.7	6	30.0	1.9	T	55.0	35.1	11	264	282	321	
9-10	32.0	150566	75	5	1.7	0.1	0.2	0.1	8.1	5	31.9	2.4	T	57.0	41.5	2	276	313	336	
10-14	172.0	150825	50	16	1.1	0.0	0.1	0.0	10.1	25	40.5	6.9	0.1	55.1	29.7	16	212	260	331	
11-11	297.0	150987	44	12	0.7	0.1	0.2	0.0	8.8	7	42.4	8.1	T	69.5	37.9	7	284	330	350	
12-16	119.0	151240	38	4	0.3	0.1	0.1	0.0	6.3	7	36.2	6.0	T	71.9	38.2	4	292	337	366	
1960																				
1-20	450.0	151503	32	24	0.7	0.1	0.1	0.0	10.4	4	38.1	6.7	T	68.1	36.4	1	272	320	335	0.1
2-17	168.0	151719	33	14	0.1	T	0.2	0.0	6.9	6	35.6	7.9	T	68.5	37.2	2	276	325	343	0.0
3-10	85.0	151837	33	9	0.3	0.1	0.1	0.0	7.6	7	34.4	7.2	T	69.1	38.1	5	288	330	350	0.1
4-13	276.0	152029	56	29	1.5	0.1	0.2	0.0	7.3	10	37.0	7.4	T	66.9	35.6	2	260	314	356	0.2
5-26	363.0	152299	64	5	0.8	0.1	0.2	0.0	6.0	5	34.4	5.4	0.1	65.2	36.3	2	269	312	342	0.1
6-22	206.0	152570	67	23	1.3	T	0.2	0.0	9.8	5	34.8	2.6	T	69.2	38.9	3	294	333	356	0.1
7-14	125.0	152779	74	30	1.2	0.1	0.2	0.1	8.3	6	31.5	8.3	T	71.1	37.1	4	290	330	359	0.4
8-11	81.0	152942	77	20	1.3	0.2	0.2	0.1	7.9	6	28.4	6.0	T	65.1	37.7	6	288	318	245	0.3
9-21	72.0	153274	62	28	1.7	T	0.1	0.1	9.0	6	24.7	7.4	T	57.5	35.5	6	264	290	381	0.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
10-20	58.0	153497	49	14	0.8	0.1	0.1	0.1	13.3	6	29.0	6.1	0.1	68.4	39.9	6	304	335	359	0.3
11-17	210.0	153643	48	360	8.7	0.2	0.1	0.0	9.0	10	29.2	9.6	T	42.6	21.3	8	160	194	245	0.8
12-14	81.0	153825	33	4	0.3	0.0	0.1	0.1	9.0	5	38.9	8.2	T	74.9	41.2	8	320	357	381	0.4
1961																				
1-18	48.0	154053	33	4	0.1	0.0	0.1	0.0	5.9	6	29.8	5.1	T	68.1	37.6	7	296	325	341	0.1
2-15	68.0	154197	34	5	0.5	0.2	0.1	0.1	6.5	5	28.2	6.1	T	60.0	35.3	5	264	295	311	0.2
3-23		Broke bottle – no sample																		
4-26	515.0	154723	50	102	4.1	0.2	0.1	0.0	8.0	6	34.8	11.5	0.1	56.0	28.9	14	236	259	309	0.3
5-24	100.0	154912	61	19	0.9	0.2	0.1	0.0	1.9	6	33.5	4.1	0.1	63.7	36.8	7	280	311	342	0.0
6-7	113.0	154985	73	27	1.4	0.2	0.1	0.1	3.9	5	30.9	5.4	T	66.5	38.5	5	292	325	328	0.3
7-7	100.0	155231	66	350	4.6	0.4	0.2	0.0	5.9	4	21.6	7.3	0.1	39.5	16.8	8	152	168	197	0.3
8-23	38.0	155551	75	14	0.7	0.5	0.1	0.1	6.0	5	25.5	2.2	0.6	52.0	41.6	3	272	301	316	0.2
9-20	129.0	155696	63	21	1.0	0.1	0.2	0.1	9.9	5	39.1	8.7	T	72.0	37.0	5	288	332	357	0.4

BAY CREEK AT NEBO

Bay Creek rises northwest of Pittsfield, in the Lincoln Hills physiographic region, flows southeasterly to below Pittsfield and then southwesterly to its confluence with Hadley Creek. The gaging station is west of Nebo, and the elevation of gage datum is 462.56 feet above mean sea level. The drainage area is 162 square miles, including that of Spring Creek.

Water quality data are tabulated for the period from October 13, 1961, to September 8, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were appreciably greater than those of the USGS average daily flows shown for 1950 to 1964. Annual rainfall during the period of sample collection was from 14.03 inches above normal to 5.51 inches below normal, based on records for one station. The average annual departure was —1.21 inches.

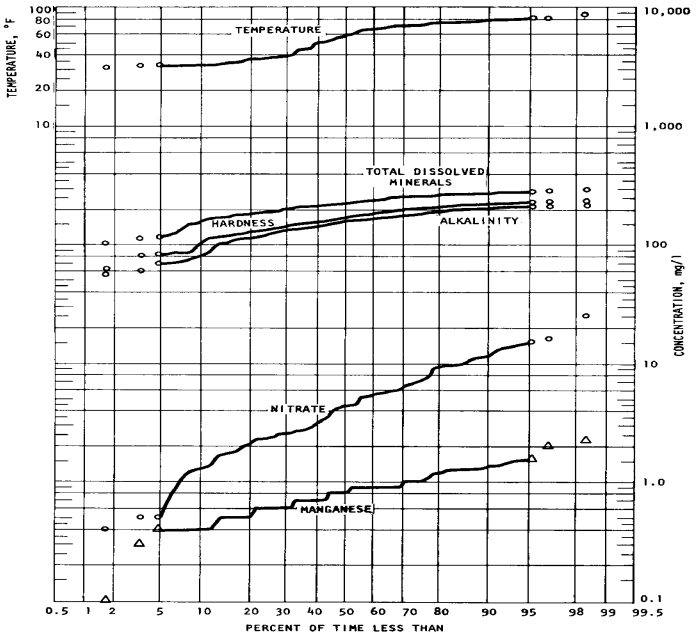
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.9 cfs/sq mi, and was not less than 0.015 cfs/sq mi, with a median flow of 0.12 cfs/sq mi. The minimum average daily flow of record was 0 cfs in several months of 1953-1959.

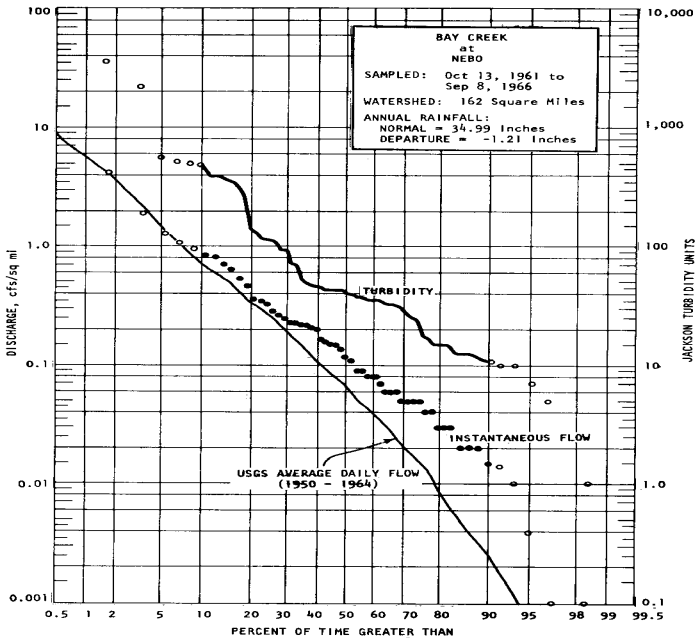
The turbidity was not less than 10 Jtu nor more than 500 Jtu for the central 80 percent of the time, with a median value of 40 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 30 percent of the time. They were below 50 F for 45 percent and below 40 F for 30 percent of the time.

The analyses indicated the following:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	80	160	210
Hardness (as $CaCO_3$)	105	180	225
Total dissolved minerals	160	230	280
Nitrate	1.3	4.4	11.9
Manganese	0.4	0.8	1.4





Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-13	22.0	155895	66	12	0.9	0.4	0.1	0.1	11	9	32.3	3.5	T	63.5	17.0	7	196	229	258	0.2
11-10	44.2	156154	45	13	1.0	0.4	0.2	0.1	13.0	8	31.9	7.0	T	58.7	13.6	11	176	203	258	0.1
12-12	35.1	156328	33	10	1.0	0.5	0.2	0.0	9.3	8	36.8	5.2	T	60.3	17.8	14	200	224	265	0.1
1962																				
1-12	37.8	156491	33	13	1.0	0.7	0.2	0.1	12.5	10	38.7	9.3	0.3	64.5	18.8	15	212	239	300	0.1
2-12	105.0	156781	38	43	3.2	0.4	0.2	0.1	10.4	8	33.7	9.7	T	47.7	10.8	10	132	164	216	0.3
3-12	216.0	156963	39	525	19.0	0.9	0.2	0.0	9.8	9	37.8	14.4	T	40.0	9.7	13	104	140	199	0.3
4-12	60.2	157297	52	13	1.0	0.4	0.1	0.0	6.1	9	37.4	2.9	0.1	56.2	15.7	8	168	205	238	0.1
5-10	47.3	157546	70	36	1.9	0.7	0.2	0.1	10.8	10	36.2	6.7	T	57.8	16.4	12	180	212	284	0.1
6-21	20.2	157911	77	33	1.9	0.6	0.2	0.0	11.4	7	29.6	2.7	T	61.4	14.5	12	196	213	261	0.2
7-24	18.6	158254	76	38	2.1	0.8	0.1	0.2	10.0	8	24.3	1.8	T	63.1	14.3	12	204	217	278	0.2
8-16	8.6	158411	77	48	2.0	0.8	0.1	0.0	9.7	6	16.3	3.1	T	48.7	9.7	19	152	162	210	0.1
9-11	20.0*	158814	68	47	2.9	0.9	0.2	0.0	9.3	6	16.0	3.2	0.1	44.9	9.1	10	144	150	184	0.2
10-14	7.5	158602	75	112	6.7	0.8	0.3	0.2	7.4	7	14.0	1.4	0.1	37.0	8.9	9	124	129	178	0.2
11-9	8.5*	159005	44	26	2.5	0.9	0.1	0.1	9.8	6	16.5	2.4	0.1	58.6	12.0	7	184	196	237	0.1
12-13	5.6	159205	32	10	1.6	0.3	0.3	0.1	5.6	11	22.6	2.6	0.1	66.0	15.1	24	220	227	275	0.0
1963																				
1-10	9.7	159326	34	15	1.5	0.5	0.1	0.0	8.8	9	24.5	4.5	0.1	60.7	13.9	13	196	209	252	0.0
2-7	139.0	159483	33	114	6.1	0.9	0.1	0.0	8.3	17	33.9	25.1	0.1	34.5	9.8	20	92	127	231	3.0
3-6	156.0	159709	37	343	5.9	0.9	0.1	0.0	7.6	9	26.3	16.9	0.1	25.7	5.7	10	56	88	150	0.5
4-4	24.0	159948	60	39	1.8	0.7	0.2	0.1	4.9	10	29.0	1.8	0.4	53.3	13.0	15	176	187	222	0.0
5-10	8.8	160217	80	43	2.1	1.6	0.2	0.1	4.2	15	28.2	4.1	0.1	60.6	14.5	21	204	211	281	0.2
6-7	13.6	160382	79	46	2.9	1.26	0.3	0.1	7.4	7	25.1	2.8	0.1	60.8	14.1	13	200	210	264	0.3
7-6	208.0*	160697	83	488	22		0.2	0.1	13.6	3	9.8	5.4	0.1	25.5	5.6	0	70	87	119	0.3
8-9	6.7	160988	82	53	2.0	1.46	0.1	0.0	10.7	6	16.7	2.3	T	46.6	8.5	11	148	152	198	0.2
9-13	32.1	161220	67	368	19	.92	0.2	0.2	7.5	4	15.6	1.2	T	20.2	3.3	9	60	64	101	0.4
10-10	1.7	161424	66	43	2.0	1.02	0.2	0.0	11.3	7	18.1	3.4	0.1	54.4	10.2	11	172	178	218	0.6
11-7	2.2	161629	54	36	2.1	.63	0.2	0.1	11.0	8	31.3	0.5	0.1	56.9	11.6	17	184	190	241	0.3
12-6	3.5	161795	38	15	1.3	.50	0.3	0.1	9.3	7	20.0	1.7	T	58.0	11.4	12	186	192	230	0.2
1964																				
1-9	4.8	162017	33	11	1.2	.65	0.2	0.0	7.1	22	19.1	6.8	0.1	65.7	14.0	5	176	222	277	0.1
2-6	13.7	162233	39	18	1.7	.54	0.1	0.1	7.0	10	19.5	7.4	T	42.4	11.4	11	136	153	188	0.1
3-5	116.0	162416	39	397	22	1.20	0.1	0.0	4.8	13	26.7	9.7	0.1	40.1	7.7	17	116	132	194	1.0
4-9	40.0	162679	45	38	2.7	.61	0.2	0.0	11.4	8	30.2	9.6	T	48.0	11.2	9	136	166	226	0.1
5-7	33.7	162873	74	43	1.9	.91	0.2	0.1	6.5	10	30.9	2.6	T	55.6	14.1	10	172	197	244	0.1
6-4	13.6	163132	67	95	5.6	1.27	0.2	0.0	9.4	10	22.2	2.4	T	53.8	11.6	6	156	182	222	0.1
7-21	10.7	163597	80	70	4.4	.56	0.3	0.0	6.0	15	16.7	2.3	T	42.4	7.5	20	140	137	190	0.3
8-14	0.2	163731	68	35	1.4	.99	0.1	0.1	11.4	17	23.2	2.6	0.2	55.0	10.9	23	182	182	277	1.2

Date	Instantaneous discharge	Laboatory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1964																				
9-4	0.7	164220	72	31	1.6	.91	0.1	0.1	8.1	18	40.7	5.6	T	37.7	6.6	31	116	121	215	1.3
10-9	0.2	164452	51	74	4.5	1.07	0.1	0.1	9.2	21	25.5	10.0	0.1	43.2	9.1	25	140	145	238	2.4
11-12	3.5	164682	60	40	1.8	1.37	0.1	0.0	9.9	7	16.3	0.4	0.2	44.3	9.8	15	156	151	215	0.5
12-10	4.9	164831	35	144	8.2	.91	0.1	0.1	8.0	10	19.7	6.0	T	43.3	7.7	13	128	139	199	0.4
1965																				
1-9	9.4	165003	35	37	2.1	.71	0.2	0.2	5.8	14	22.0	7.8	T	47.2	13.1	17	160	172	228	0.2
2-4	8.9	165154	33	7	0.5	.60	0.1	0.2	9.6	10	26.1	5.9	0.3	53.3	12.4	14	168	184	242	0.1
3-12	53.0	165425	38	34	1.8	.58	0.1	0.0	9.3	18	33.1	11.3	T	49.1	12.5	20	148	174	253	0.3
4-9	76.6	165680	58	116	7.0	.64	0.1	0.0	11.1	12	33.3	13.9	0.0	46.7	11.1	20	142	162	226	0.3
5-4	35.0	165842	73	28	1.5	.91	0.2	0.1	7.0	11	31.1	4.5	0.0	56.3	14.5	18	188	200	259	0.2
6-11	56.2	166281	75	2250	97	2.03	0.2	0.1	8.5	8	13.8	5.5	T	24.0	5.4	13	80	82	130	0.2
7-21	24.5	166729	72	43	3.0	.68	0.2	0.1	10.1	13	21.4	2.1	0.0	51.5	12.3	15	168	179	247	1.7
8-13	3.1	166989	80	33	2.1	1.44	0.2	0.2	8.3	12	15.6	2.7	0.0	43.0	9.4	14	142	146	213	1.0
9-10	15.1	167212	77	93	3.8	1.30	0.2	0.2	9.9	10	11.7	5.2	0.0	35.7	8.0	10	116	122	175	0.3
10-7	36.6	167373	55	17	1.7	.84	0.2	0.1	11.5	12	30.0	2.0	0.0	57.8	16.8	17	200	213	284	0.2
11-5	10.5	167551	52	15	1.9	.73	0.1	0.1	6.7	15	25.7	0.9	0.1	63.5	15.7	17	212	223	276	0.3
12-10	8.7	167869	44	5	2.1	.43	0.1	0.1	5.8	15	25.9	0.5	T	63.4	16.3	18	216	225	272	0.1
1966																				
1-18	13.9	168125	33	1	0.4	.13	0.1	0.1	10.6	13	31.1	4.4	0.1	65.8	16.5	17	216	233	292	0.1
2-11	133.0	168295	38	508	26.0	1.19	0.1	0.1	10.3	12	25.5	15.4	T	30.3	6.7	11	72	103	158	0.4
3-2	178.0	168422	40	277	21.0	.93	0.1	0.0	11.1	14	36.4	11.9	T	54.0	15.8	16	168	200	268	0.6
4-20	701.0	168716	57	3650	116.0	2.33	0.1	0.0	12.3	7	23.9	5.8	0.1	33.9	8.2	11	102	118	174	0.7
5-19	317.0	168974	64	565	42.0	1.00	0.1	0.0	12.9	7	29.4	11.6	0.1	39.9	8.9	12	112	136	187	0.3
6-22	27.6	169135	78	49	3.7	.78	0.3	0.1	12.5	8	25.5	6.0	0.0	54.0	12.7	9	164	187	242	0.1
7-14	6.6	169412	87	24	1.3	1.28	0.3	0.1	11.9	11	20.2	1.3	T	66.0	14.7	9	208	225	275	0.3
8-11	25.7	169737	70	134	5.6	.48	0.3	0.0	6.3	8	17.9	4.4	0.0	45.9	11.1	8	144	160	210	0.2
9-8	2.5	169822	72	397	25.0	1.33	0.3	0.1	7.9	7	14.0	4.2	0.0	25.2	5.1	9	76	84	121	0.1

*USGS average daily discharge

BEAUCOUP CREEK NEAR MATTHEWS

Beaucoup Creek rises in the Mt. Vernon Hills Region east of Nashville and flows south to its junction with the Big Muddy River east of Murphysboro. The gaging station is located 1.2 miles east of Matthews, and the elevation of the gage datum is 368.15 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 291 square miles.

The tabulation of water quality data is for the period from October 17, 1961, to September 22, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were similar to those indicated by the USGS average daily flow records during 1950-1964, but showed marked deviation at the extreme values. Annual rainfall during the period of sample collection was from 7.30 inches above normal to 10.26 inches below normal, based on records for one station. The average annual departure was —4.41 inches.

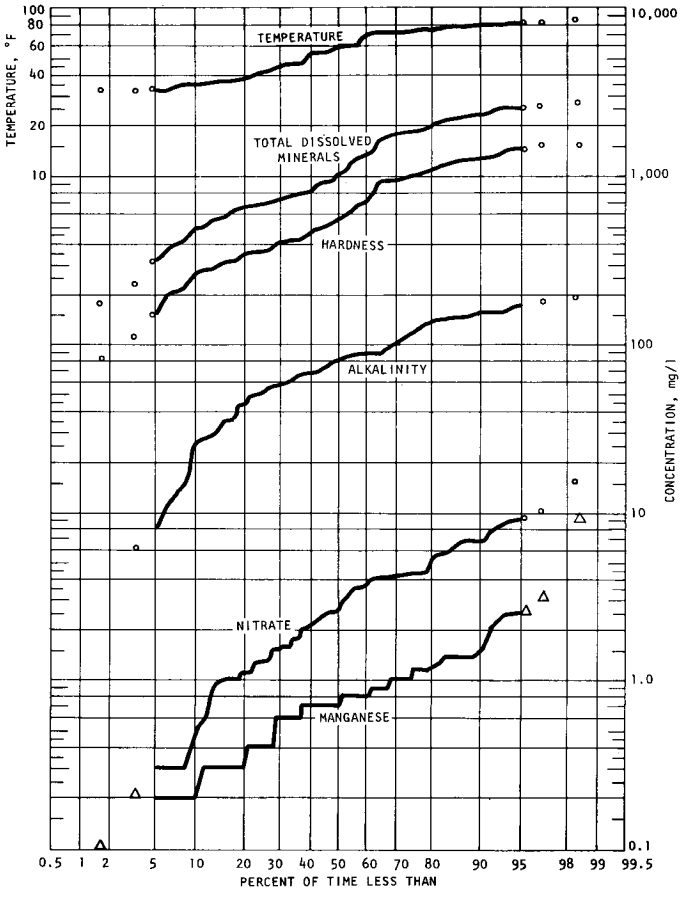
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.65 cfs/sq mi, and was not less than 0.0048 cfs/sq mi, with a median flow of 0.081 cfs/sq mi. The minimum average daily flow of record was 0 cfs for several months of 1953-1959 and 1961-1963.

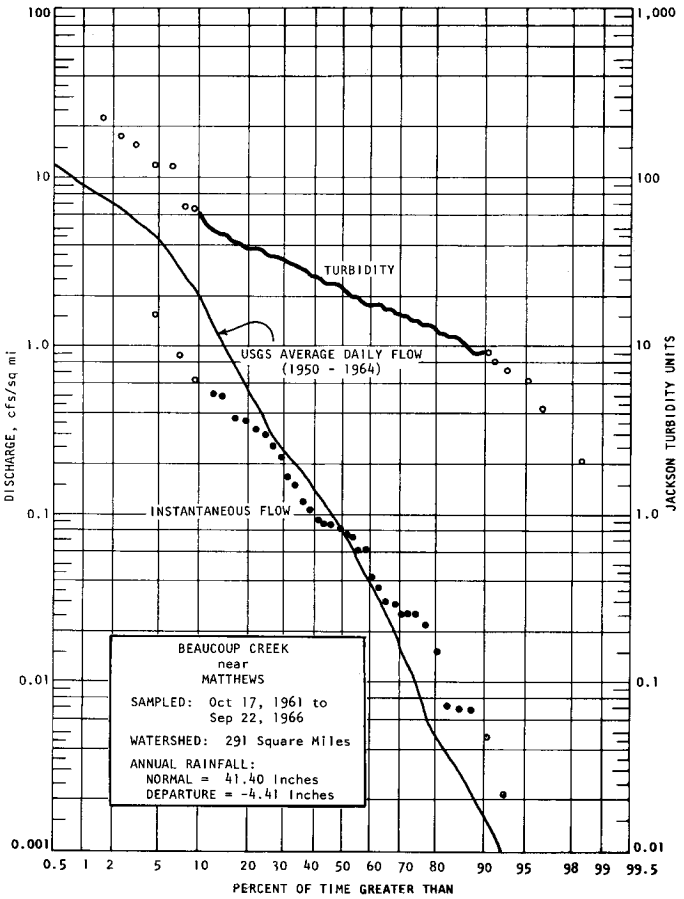
The turbidity was not less than 9 Jtu nor more than 65 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were over 80 F for 10 percent and over 70 F for 40 percent of the time. They were below 50 F for 35 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	30	80	155
Hardness (as $CaCO_3$)	280	585	1305
Total dissolved minerals	495	995	2380
Nitrate	0.5	2.7	6.9
Manganese	0.2	0.7	1.6





Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved mineral TDM	Phosphate (filtered) PO_4
1961																				
10-17	8.7	155896	59	12	0.9	0.7	0.2	0.4	4.8	15	1472.8	3.9	0.1	299.2	178.8	89	120	1483	2244	0.1
11-14	5.1*	156148	53	24	2.0	1.0	0.2	0.2	6.1	29	488.9	4.4	T	111.0	45.6	75	76	465	819	0.1
12-7	107.0	156329	43	19	2.2	0.2	0.2	0.1	8.5	125	320.9	1.5	T	85.0	40.5	101	88	379	760	0.1
1962																				
1-17	700.0	156492	33	39	1.9	0.3	0.2	0.1	6.4	15	112.5	4.4	0.1	27.2	12.4	25	32	119	234	0.2
2-7	92.4	156777	37	20	1.9	0.4	0.2	0.2	8.7	80	380.5	5.7	T	97.3	43.9	78	80	424	789	0.2
3-6	189.0	156968	39	46	3.7	0.4	0.1	0.0	8.7	37	298.5	4.1	0.1	73.6	32.6	53	68	318	553	0.0
4-18	76.5	157298	55	25	2.9	0.6	0.2	0.1	7.8	33	423.7	3.6	0.1	73.5	29.4	124	84	305	758	0.1
5-15	25.9	157951	74	27	2.2	1.2	0.2	0.1	3.9	46	499.2	3.3	0.1	131.2	51.6	74	116	541	932	0.0
6-26	106.0	157914	73	34	1.4	1.3	0.1	0.2	5.9	16	416.7	4.0	T	107.4	35.4	34	28	414	679	0.0
7-27	0.8*	158255	79	15	1.0	1.4	0.1	0.3	5.8	28	671.4	2.0	0.1	136.4	62.0	69	8	596	1037	0.0
8-21	0.2*	158413	80	26	0.7	1.0	0.1	0.4	3.3	36	1124.8	0.3	T	240.4	111.6	99	52	1060	1796	0.0
9-18	0.3*	158601	71	42	17	2.5	0.1	0.2	4.3	36	1086.9	1.0	0.1	232.8	97.3	92	9**	982	1650	0.0
10-15	0.1*	158815	73	20	2.8	9.8	0.1	0.1	8.1	19	715.0	6.3	0.9	154.8	60.8	63	0	637	637	0.0
11-13	0.0*	159004	46	11	1.3	0.8	0.3	0.4	7.1	23	1487.6	1.1	T	354.5	129.3	149	160	1418	2438	0.0
12-18	0.0*	159203	38	30	3.4	1.6	0.1	0.3	5.3	56	1281.9	4.3	T	292.4	118.4	128	80	1218	2076	0.0
1963																				
1-14	0.0*	159366	33	24	2.4	0.1	0.1	0.2	6.1	90	354.6	9.6	0.1	89.5	36.6	83	52	374	702	0.1
2-11	22.4	159551	33	13	1.9	1.2	0.4	0.2	6.1	110	1097.6	6.8	0.2	248.0	100.9	185	136	1035	1930	0.1
3-13	62.0*	159763	48	34	2.5	0.8	0.3	0.1	7.7	69	394.1	8.6	0.1	960	39.9	71	44	404	743	0.4
4-10	25.0*	159946	58	119	8.1	0.3	0.2	0.1	8.2	28	570.6	15.1	0.2	135.8	56.5	107	160	572	1114	0.2
5-15	11.0*	160215	71	22	1.5	.86	0.2	0.3	1.6	92	1073.8	1.0	0.1	242.0	94.4	189	156	993	1798	0.0
6-11	1.0*	160391	77	22	1.1	.85	0.3	0.3	2.8	38	1104.2	1.6	0.1	232.8	101.2	161	144	998	1815	0.1
7-23	8.0*	160794	82	40	2.8	.55	0.3	0.1	6.1	31	274.0	2.3	0.1	66.0	27.5	49	54	278	502	0.1
8-13	36.0*	160991	78	39	11	3.22	0.1	0.2	7.1	17	737.0	2.5	0.2	148.8	60.1	67	28**	619	1086	0.1
9-16	0.0*	161222	76	16	0.7	.96	0.3	0.3	11.3	45	1535.9	1.0	0.2	303.0	132.9	203	84	1304	2381	0.7
10-14		161426	68	11	0.7	.89	0.2	0.3	3.8	52	1738.0	2.1	T	324.0	180.0	203	108	1550	2808	0.2
11-12	1.0*	161628	47	2	0.4	.23	0.2	0.3	5.2	49	1363.6	0.0	T	284.8	106.5	221	144	1150	2244	0.0
12-10	7.2*	161793	37	18	1.5	.68	0.3	0.5	5.1	36	1083.0	3.6	T	227.2	95.3	129	60	960	1684	0.0
1964																				
1-15	6.0*	162021	33	15	3.1	2.60	0.1	0.3	7.0	42	1089.0	10.9	T	238.0	98.0	134	88	998	1818	0.0
2-11	23.0*	162241	37	39	3.3	.74	0.2	0.1	5.8	89	424.8	7.9	T	96.0	42.3	90	36	414	795	0.0
3-10	4750.0*	162420	42	228	11	.74	0.3	0.1	5.2	15	93.8	5.9	0.2	22.4	6.1	22	6	81	181	0.1
4-14	128.0*	162676	61	51	4.2	.70	0.2	0.1	9.2	48	373.3	4.3	T	90.0	37.9	66	64	381	679	0.0
5-12	18.0*	162870	71	29	1.5	1.29	0.4	0.3	5.8	42	825.2	0.6	T	187.2	79.0	94	80	793	1373	0.0
6-8	5.0*	163134	79	18	1.3	.79	0.2	0.1	6.1	41	459.7	3.0	0.0	116.4	45.5	61	72	478	818	0.0
7-29	1.1*	163620	83	13	0.7	.95	0.0	0.2	2.1	128	1232.3	1.3	T	250.8	115.9	167	12	1102	1984	0.2
8-18	2.1*	163730	75	7	0.3	.32	0.3	0.4	4.0	49	1627.3	0.3	0.1	340.0	173.0	176	182	1560	2685	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total Dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-11	2.0*	164218	72	21	0.9	.80	0.2	0.2	1.4	30	878.8	2.0	T	170.4	79.0	142	100	749	1424	0.5
10-13	4.1*	164450	56	9	1.0	.57	0.4	0.3	4.0	24	1320.6	1.6	0.1	318.5	120.0	121	144	1288	2122	0.0
11-17	6.1*	164684	58	8	0.6	.23	0.2	0.3	5.0	36	1518.1	0.5	T	374.6	136.9	151	196	1448	2506	0.0
12-14	13.0*	164829	39	24	1.4	1.96	0.2	0.3	5.8	20	871.3	6.9	T	197.2	79.8	81	56	820	1288	0.0
1965																				
1-12	26.3	165000	40	32	6.0	1.38	0.1	0.3	6.1	28	446.0	2.5	0.5	94.4	34.2	61		376	687	0.0
2-12	471.0	165172	45	151	10	.59	0.2	0.2	6.9	19	247.9	6.8	T	56.1	21.2	42	284**	227	403	0.0
3-16	27.6	165428	48	17	1.6	.62	0.1	0.1	8.6	41	532.8	4.0	T	112.0	51.9	86	66	493	921	0.1
4-13	50.7	165679	62	37	3.0	.68	0.2	0.2	9.7	44	473.5	1.8	T	104.0	45.1	90	84	445	833	0.0
5-11	8.5	165932	70	34	1.9	1.43	0.3	0.5	2.8	69	1552.6	1.5	T	266.7	154.8	270	176	1302	2655	0.1
6-15	5.8*	166278	75	17	1.1	.75	0.3	0.3	3.2	56	760.7	2.8	0.1	150.4	73.9	127	84	679	1295	0.0
7-26	2.7*	166805	86	10	0.5	.31	0.0	0.3	3.1	50	1444	0.0	0.0	297.6	130.1	182	104	1280	2352	0.8
8-17	1.4	166990	85	9	0.5	.19	0.2	0.1	1.2	37	247.0	2.4	T	67.2	27.5	53	84	281	497	0.3
9-15	87.4	167206	70	31	4.1	.34	0.2	0.1	7.8	37	143.4	3.5	0.0	39.8	14.0	42	44	157	320	0.3
10-14	7.7	167376	55	14	1.5	.67	0.2	0.2	6.6	47	489.2	0.9	T	119.6	43.9	85	88	480	913	0.2
11-9	2.3*	167548	55	6	0.5	.24	0.1	0.3	6.1	52	1343.6	1.3	0.0	292.0	112.2	194	140	1190	2108	0.1
12-14	0.6	167870	44	14	0.7	.86	0.2	0.2	4.3	124	726.3	1.3	T	168.0	64.7	143	64	685	1333	0.1
1966																				
1-11	17.9	168126	35	12	4.2	.38	0.3	0.1	10.4	62	521.5	4.0	0.0	124.0	48.8	98	90	510	950	0.1
2-18	237.0*	168297	35	32	2.9	.41	0.3	0.1	10.4	72	326.0	4.0	T	78.0	36.6	75	64	345	649	0.1
3-9	31.4	168504	38	115	5.6	.40	0.1	0.1	8.6	53	331.6	5.5	T	86.0	28.1	70	58	330	620	0.2
4-14	265.0	168760	49	67	6.1	.72	0.1	0.1	7.9	45	297.4	4.5	T	68.0	29.3	66	56	290	537	0.1
5-13	149.0	169040	60	46	12	1.23	0.3	0.1	7.5	38	482.6	2.5	T	108.0	39.0	66	16	430	786	0.0
6-9	42.3	169165	72	18	1.2	1.36	0.3	0.1	5.5	68	360.2	1.8	0.0	90.0	40.3	76	84	390	684	0.1
7-20	1.6*	169497	85	4	1.0	.28	0.6	0.5	2.3	52	1179.1	0.0	T	260.0	104.9	166	140	1080	1909	0.0
8-19	22.7	169691	74	68	4.3	.71	0.3	0.1	3.9	43	192.5	4.1	0.0	48.0	19.5	46	36	200	383	0.1
9-22	7.6	169932	60	18	0.9	.83	0.5	0.5	4.2	27	1166.3	1.1	0.1	236.0	102.1	170	128	1010	1758	0.0

*USGS average daily discharge
**Acidity

BIG CREEK NEAR WETAUG

Big Creek rises in the Shawnee Hills Region east of Jonesboro and flows southeasterly toward its junction with the Cache River below Wetaug. The gaging station is located 2 miles southeast of Wetaug, and the elevation of the gage datum is 336.86 feet above mean sea level. The drainage basin above the gage has an area of 32.2 square miles.

The tabulation of water quality data is for the period from October 17, 1961, to September 17, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were significantly lower than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 2.71 inches above normal to 17.24 inches below normal, based on records for one station within the drainage basin. The average annual departure was —6.32 inches.

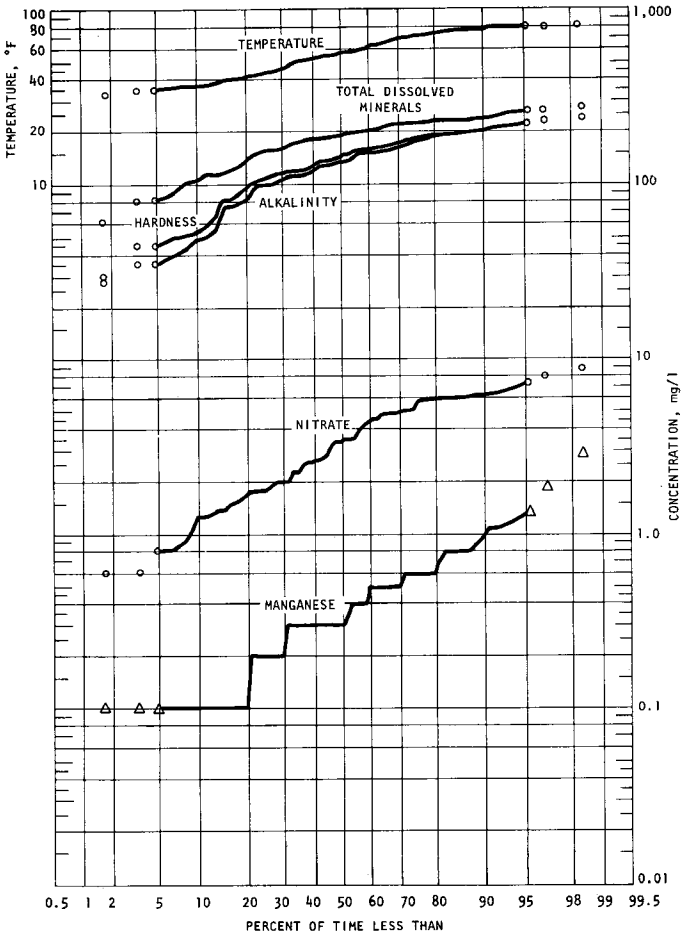
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.4 cfs/sq mi and was not less than 0.0092 cfs/sq mi, with a median flow of 0.084 cfs/sq mi. The minimum average daily flow of record was 0 cfs in September of 1954 and 1963.

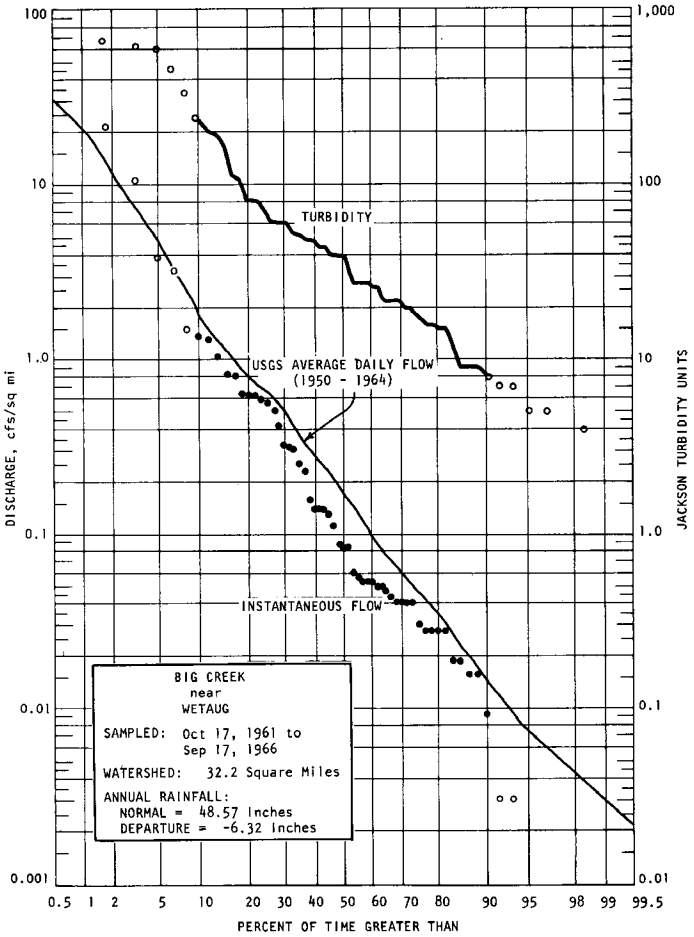
The turbidity was not less than 8 Jtu nor more than 240 Jtu for the central 80 percent of the time, with a median value of 40 Jtu.

Reported temperatures were over 80 F for 10 percent and over 70 F for 30 percent of the time. They were below 50 F for 30 percent and below 40 F for 15 percent of the time.

The analyses indicated as follows:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	50	135	210
Hardness (as $CaCO_3$)	55	150	215
Total dissolved minerals	110	190	240
Nitrate	1.3	3.5	6.4
Manganese	0.1	0.3	1.1





Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-17	0.6	156028	58.5	16	0.9	0.6	0.2	0.1	8.9	7	7.0	2.7	0.1	76.8	9.2	8	228	230	269	0.2
11-8	1.3	156097	44.8	71	4.4	0.2	0.1	0.1	8.5	5	12.8	4.4	T	32.8	3.6	11	96	97	148	0.5
12-6	18.3	156270	45	167	9.4	0.3	0.2	0.1	9.2	5	16.3	5.2	0.2	28.0	2.9	10	76	82	117	0.2
1962																				
1-25	46.1	156612	39.5	52	1.3	0.1	0.2	0.0	8.3	7	23.4	6.2	0.1	35.2	3.4	10	84	102	136	0.1
2-13	20.1	156770	57	18	1.1	0.1	0.2	0.1	10.4	8	21.0	5.9	0.1	45.3	5.7	8	116	137	185	0.1
3-15	20.2	157011	43	7	0.7	0.1	0.1	0.1	11.6	6	18.7	6.4	T	51.0	5.5	7	132	150	189	0.1
4-10	42.6	157215	50	49	4.0	0.3	0.2	0.0	11.6	4	18.7	6.4	T	40.8	2.9	7	100	114	166	0.2
5-9	16.2	157513	67.5	26	1.7	0.3	0.1	0.0	11.2	6	16.9	4.8	0.1	58.2	4.4	11	157	163	199	0.1
6-14	2.7	157817	68.5	53	2.3	0.6	0.1	0.0	11.5	6	9.9	3.4	0.0	68.0	6.8	5	188	198	224	0.1
7-18	1.7	158253	77.5	83	4.8	0.9	0.1	0.0	7.6	6	12.5	3.9	0.1	40.4	4.4	8	112	119	152	0.1
8-14	0.9	158377	76.5	50	2.2	0.6	0.1	0.0	6.1	7	7.2	0.6	0.1	66.0	7.1	11	200	194	229	0.1
9-11	1.3	158581	68.5	60	3.2	0.3	0.1	0.0	8.9	3	9.3	2.0	0.1	40.0	5.6	4	116	123	156	0.0
10-3	8.1	158705	60	603	13	1.2	0.2	0.1	5.4	3	8.2	1.8	0.1	16.2	2.6	4	48	51	84	0.2
11-7	1.6	158985	47	5	0.4	0.1	0.1	0.1	7.9	7	8.8	0.8	0.1	74.1	6.9	10	216	214	243	0.1
12-12	0.5	159185	35.5	15	0.4	0.1	0.1	0.0	4.8	8	10.3	2.0	0.1	74.8	11.2	5	220	233	249	0.0
1963																				
1-9	4.6	159337	36.5	8	0.7	0.1	0.2	0.0	8.3	5	40.3	1.7	T	20.2	4.3	9	36	68	118	0.1
2-13	2.8	159548	33	16	1.1	0.1	0.2	0.1	5.8	14	17.3	5.1	0.1	56.0	7.1	11	152	169	227	0.1
3-12	128.0	159809	56	194	11	0.5	0.1	0.1	7.7	5	11.1	5.9	0.1	16.0	1.5	8	40	46	90	0.3
4-3	10.7	159918	64	39	2.9	0.4	0.1	0.1	9.5	7	15.2	6.2	0.2	52.4	6.9	10	150	159	196	0.1
5-8	5.3	160147	65	28	2.2	0.6	0.0	0.0	10.2	7	17.5	8.2	0.1	57.0	5.5	8	152	165	199	0.2
6-12	1.5	160397	78.5	7	0.5	.37	0.2	0.1	5.3	7	11.3	1.6	0.1	62.4	5.8	18	184	180	224	0.2
7-11	0.5	160616	75.5	20	1.0	.62	0.2	0.0	6.0	7	7.6	2.6	T	62.5	5.0	22	196	187	226	0.3
8-6	0.3	160858	81	23	1.4	.46	0.2	0.1	7.8	7	4.9	0.8	0.1	58.2	7.6	3	170	177	204	0.2
9-17	0.0	161310	77	12	0.5	.32	0.2	0.0	6.3	7	9.4	3.6	0.2	60.7	8.1	10	184	185	225	0.1
10-10	0.1	161379		22	1.1	.50	0.2	0.1	4.6	7	1.6	1.3	0.1	70.1	10.1	2	208	217	228	0.2
11-12	0.0	161650	50.5	22	0.7	.55	0.3	0.1	7.1	8	3.5	1.8	0.1	75.6	11.7	11	244	237	265	0.1
12-12	1.3	161854	37	9	0.7	.11	0.1	0.1	6.5	8	12.0	2.5	T	54.4	5.6	9	152	159	191	0.1
1964																				
1-8	1.0	162011	38	109	11	1.36	0.2	0.1	7.8	18	13.0	1.4	T	81.0	9.8	3	210	243	278	0.2
2-5	1.3	162217	42	28	1.8	.26	0.2	0.1	6.0	15	15.2	3.4	T	57.6	7.1	11	158	173	219	0.1
3-3	1.8	162365	48	9	0.9	.17	0.2	0.1	1.6	19	20.8	1.5	T	52.1	6.7	16	144	158	202	0.1
4-9	20.6	162633	52	28	1.8	.19	0.1	0.0	11.2	7	21.8	6.8	0.2	42.4	4.4	11	110	124	167	0.0
5-14	4.2	162948	64	44	4.0	.49	0.2	0.1	9.3	7	9.1	3.6	T	55.7	5.7	5	152	163	181	0.2
6-2	1.7	163100		49	2.1	.35	0.1	0.0	9.0	8	11.3	2.6	0.0	65.1	7.7	6	180	193	228	0.2
7-9	1.9*	163479	75	242	16	.83	0.2	0.0	5.7	4	7.4	4.9	T	18.4	3.4	6	56	60	82	0.0
8-13	0.0	163707	70	39	2.6	.83	0.2	0.1	6.1	4	7.8	1.3	0.1	44.8	5.8	8	140	136	175	0.3

Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-2	1.6	164083	83	201	12	.67	0.2	0.1	7.7	5	16.0	5.9	T	16.4	1.2	12	44	46	106	0.3
10-14	0.6	164501	61	9	0.8	.20	0.2	0.0	10.4	8	13.2	2.3	0.1	53.4	6.6	12	160	160	202	0.0
11-11	0.1	164660	56	20	1.1	.24	0.2	0.1	7.8	11	4.1	0.6	T	74.8	7.2	19	236	216	285	0.4
12-9	4.4	164814	37	47	3.3	.13	0.1	0.1	9.5	8	16.0	4.6	T	41.5	5.7	17	132	127	190	0.3
1965																				
1-13	13.4	165085	41	15	1.7	.16	0.0	0.1	4.8	5	15.0	2.0	T	42.7	4.7	10	124	126	161	0.1
2-10	714.0	165226	52	455	19	1.13	0.1	0.1	6.9	4	12.5	7.4	0.1	9.6	1.5	10	28	30	63	0.3
3-12	18.9	165548	44	22	1.4	.26	0.1	0.0	10.6	11	21.4	4.8	T	51.1	5.2	15	140	149	229	0.1
4-15	107.0	165688	56	337	24	1.12	0.1	0.0	7.9	6	13.8	6.2	T	17.8	2.1	13	52	53	120	0.3
5-19	3.7	166011	71	40	2.7	.77	0.1	0.0	10.2	9	10.9	2.3	0.1	63.4	7.1	16	196	187	246	0.0
6-15	4.6	166327	78	62	4.5	.52	0.1	0.0	10.3	8	14.2	3.6	T	47.3	5.1	14	140	139	207	0.1
7-13	10.2	166660	79	63	4.5	.07	0.1	0.0	9.9	8	10.7	2.9	T	41.5	4.1	9	116	121	177	0.1
8-12	0.9	167014	82	115	8.3	.80	0.2	0.0	7.9	9	7.8	2.7	T	37.6	4.1	18	128	111	182	0.2
9-8	0.9	167209	79	40	4.5	.28	0.2	0.0	7.3	9	6.0	4.6	T	44.7	3.8	12	132	127	186	0.3
10-7	33.6	167332	58	44	2.6	.31	0.1	0.0	10.7	10	6.2	5.8	T	50.1	3.6	10	136	140	209	0.3
11-4	2.7	167529	54	5	0.6	.08	0.1	0.1	9.6	9	12.8	0.9	T	65.6	7.4	11	192	194	245	0.1
12-9	1.4	167824	43	4	0.4	.09	0.1	0.1	9.2	13	12.8	1.4	0.1	58.6	6.6	17	172	173	231	0.3
1966																				
1-2	26.0	168099	40	26	2.6	.28	0.0	0.1	13.1	11	22.4	6.1	0.1	46.8	4.6	12	116	136	194	0.2
2-9	49.7	168249	36	81	5.2	.34	0.0	0.1	6.5	7	18.9	6.5	T	18.4	1.9	8	36	54	110	0.7
3-24	7.4	168599	54	18	1.4	.34	0.1	0.0	9.0	11	18.1	1.9	0.0	61.2	7.1	10	168	182	230	0.1
4-15	27.1	168756	53	32	3.1	.30	0.5	0.1	11.2	9	21.2	5.1	0.0	40.0	4.6	9	100	119	161	0.1
5-13	335.0	169036	58	627	49	2.94	0.1	0.0	4.8	5	12.6	3.3	0.0	28.6	3.0	7	76	84	125	0.2
6-9	10.0	169169	74	678	61	1.94	0.1	0.1	7.1	9	18.3	9.0	0.1	30.0	3.7	13	80	90	134	0.2
7-22	1.7	169496	80	62	1.0	.51	0.3	0.1	6.9	6	10.7	4.2	T	41.5	4.7	4	108	123	154	0.1
8-25	0.9	169697	80	79	2.9	.38	0.3	0.1	8.0	5	8.9	4.9	T	35.5	4.0	7	100	105	144	0.2
9-17	4.1*	169931	62	28	1.2	.51	0.2	0.0	7.9	7	7.4	1.8	0.1	66.5	7.8	8	196	198	237	0.1

*USGS average daily discharge

BIG MUDDY RIVER AT MURPHYSBORO

The Big Muddy River rises in the Mt. Vernon Hills Region north of Mt. Vernon and flows south and southwesterly through Murphysboro to its junction with the Mississippi River. The gaging station at Murphysboro is located 0.1 mile upstream from Lewis Creek, and the elevation of the gage datum is 335.5 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 2154 square miles.

The analysis of water quality data is for the period from July 31, 1956, to July 12, 1961; tabulations were made through September 13, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were generally higher than those indicated by the USGS average daily flow records during 1931-1950. Annual rainfall during the period of sample collection was from 16.6 inches above normal to 11.32 inches below normal, based on records for four stations within the drainage basin. The average annual departure was +3.17 inches.

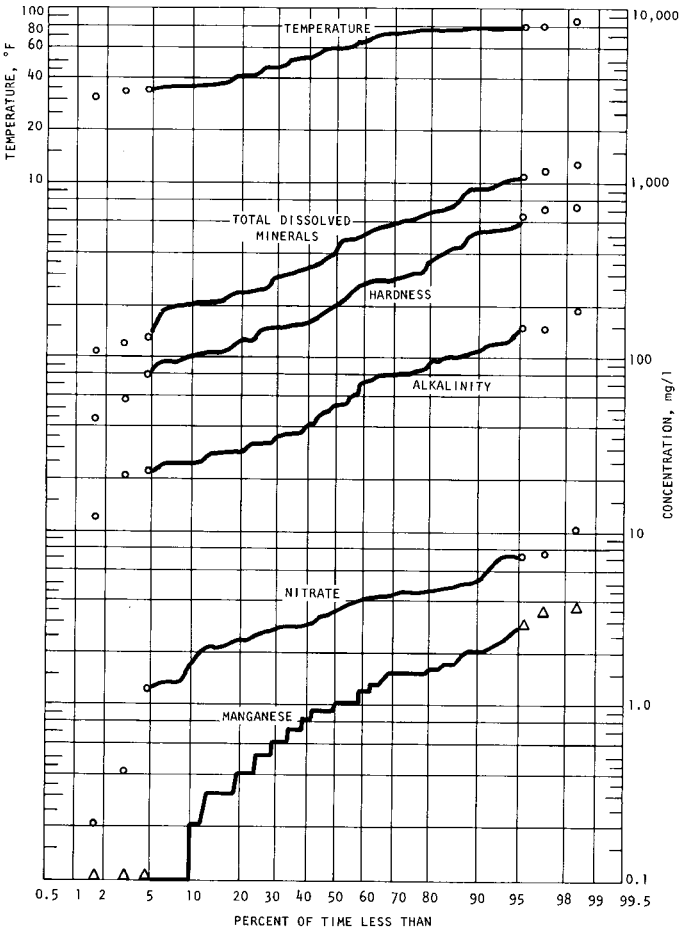
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 2.6 cfs/sq mi and was not less than 0.0135 cfs/sq mi, with a median flow of 0.389 cfs/sq mi.

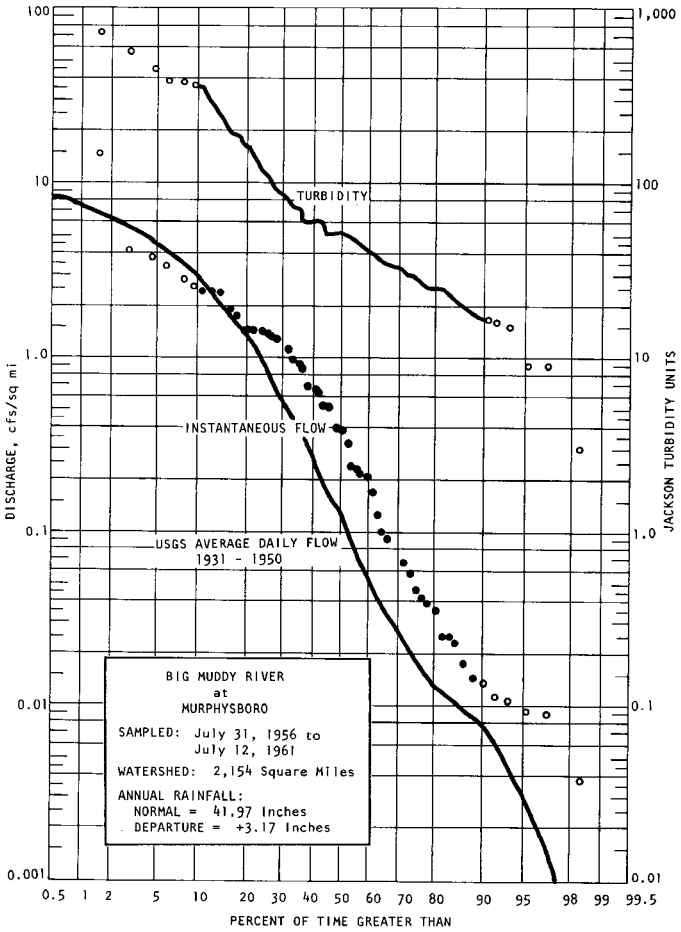
The turbidity was not less than 15 Jtu nor more than 360 Jtu for the central 80 percent of the time, with a median value of 50 Jtu.

Reported temperatures were over 80 F for 3 percent and over 70 F for 39 percent of the time. They were below 50 F for 32 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	25	50	110
Hardness (as $CaCO_3$)	95	200	540
Total dissolved minerals	200	400	940
Nitrate	1.6	3.4	5.1
Manganese	0.2	0.95	2.0





Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-31	2050.0	141139	76.5	161	10	0.1	0.3	0.1	8.1	19	74.7	2.8	0.1	23.5	9.1	21	36	97	198	
8-29	31.0	141391	77.5	30	0.9	1.7	0.3	0.2	1.7	98	149.4	2.2	0.1	49.9	20.9	74	76	211	459	
9-25	54.0	141545	68.5	3	T	1.7	0.2	0.4	3.3	60	126.2	3.8	T	42.3	11.7	66	80	154	368	
10-25	8.3	141757	62	18	0.4	0.9	0.3	0.4	2.2	104	195.2	4.0	0.1	67.9	26.4	91	124	279	589	
11-27	100.0	142006	39	39	2.2	1.4	0.3	0.0	6.6	58	289.6	4.9	T	79.3	25.4	76	80	303	605	
1957																				
1-2	77.0	142272	37.5	9	1.0	1.5	0.3	0.3	8.8	110	280.0	2.0	0.7	78.3	29.4	94	72	317	659	
2-5	499.0	142561	37	25	1.4	0.9	0.2	0.2	7.3	68	213.9	3.1	0.1	60.0	20.5	52	28	235	475	
3-6	3070.0	142798	44	60	2.5	0.1	0.1	0.1	9.6	30	99.4	3.5	T	27.9	10.4	22	12	113	241	
3-27	5200.0	143004	48	380	6.1	0.4	0.1	0.2	6.2	22	101.0	2.9	T	32.9	6.2	23	20	108	208	
5-15	868.0	143388	75	60	2.1	2.2	0.1	T	8.1	63	255.9	4.0	0.0	72.3	25.6	65	70	287	561	
6-25	510.0	143688	79.5	60	1.1	2.0	0.2	0.2	11.4	97	265.4	4.2	T	75.0	31.1	80	72	316	624	
7-22	142.0	144012	88	23	1.0	3.4	0.2	0.3	9.2	61	397.8	2.5	0.1	90.5	39.5	76	52	389	730	
8-20	1110.0	144263	75.5	95	3.9	0.4	0.2	0.2	5.3	116	246.0	2.8	0.1	59.0	24.1	117	78	246	652	
9-10	19.0	144408	74.5	25	2.9	1.5	0.2	0.2	5.1	68	221.3	4.8	T	65.2	26.5	65	80	272	503	
10-8	20.0	144719	67	48	2.8	1.3	0.1	0.3	4.1	97	229.2	3.4	T	63.2	27.0	89	84	269	595	
11-12	145.0	144998	46	19	1.9	2.4	0.3	0.1	8.0	32	288.0	10.2	T	68.5	25.9	62	60	278	537	
12-10	709.0	145272	42	51	3.0	1.3	0.2	0.2	9.2	71	238.8	2.8	T	60.0	24.9	64	40	253	507	
1958																				
1-8	4180.0	145447	35	25	1.5	0.3	0.1	0.1	9.4	21	116.6	1.3	T	31.0	12.3	24	28	128	232	
2-5	3100.0	145661	35	72	4.6	0.6	0.2	0.1	8.3	32	145.0	4.4	T	37.0	16.2	29	22	159	303	
3-5	1970.0	145924	47	193	6.2	0.5	0.1	0.1	7.6	36	150.2	4.4	T	38.9	16.5	35	30	165	325	
4-9	2450.0	146216	54	43	3.4	0.9	0.1	0.1	7.8	33	187.0	2.6	T	46.0	19.9	38	36	197	388	
5-13	8760.0	146682	67	33	1.9	0.2	0.1	0.0	7.4	16	72.8	4.1	0.1	23.2	8.8	18	32	94	188	
6-18	1420.0	146909	74	75	1.3	0.8	0.2	0.1	8.7	31	175.9	4.6	T	46.9	17.5	35	34	189	338	
7-15	3180.0	147161	77	750	14	0.7	0.2	0.0	6.3	8	64.6	2.1	T	21.1	12.1	4	32	103	130	
8-12	5150.0	147444	79	51	35	1.0	0.2	0.1	8.3	23	100.2	4.7	T	32.5	11.0	29	48	127	238	
9-24	218.0	147762	71	110	3.3	0.8	0.3	0.1	6.9	62	143.4	2.6	T	43.5	17.3	51	52	180	391	
10-15	126.0	147960	63	30	1.5	1.5	0.2	0.1	10.5	77	489.4	3.1	T	116.8	53.5	92	96	512	941	
11-12	29.0	148210	53	21	1.0	1.0	0.1	0.2	7.1	90	706.4	1.9	T	169.5	78.1	123	148	745	1329	
12-9	3120.0	148386	34	34	2.2	2.2	0.1	0.1	9.7	41	153.9	6.3	T	40.4	16.3	38	28	168	345	
1959																				
1-22	5260.0	148728	32	350	17	1.0	0.1	0.0	9.1	19	90.9	1.2	T	27.7	8.9	20	28	106	212	
2-17	6240.0	148903	40	195	5.3	0.4	0.2	0.1	9.6	22	110.5	2.1	0.2	31.0	11.1	22	24	123	259	
3-18	442.0	149157	48	49	3.2	0.3	0.1	0.0	7.6	21	117.5	3.9	T	35.0	14.5	14	24	147	243	
4-14	5640.0	149331	58	36	1.9	0.1	0.1	0.1	4.3	56	315.5	0.4	T	81.8	39.0	64	96	365	644	
5-13	465.0	149642	71	35	2.5	1.6	0.3	0.1	4.4	52	367.6	2.9	T	96.3	60.3	34	104	439	728	

Date	Instantaneous discharge cfs	Laboratory number	Temperature F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesiu Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Tota hardnes	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
6-23	54.0	149953	81	39	1.2	2.8	0.3	0.1	5.5	77	470.6	2.3	T	128.7	52.0	98	148	536	925	
7-21	48.0	150145	77	82	7.1	1.5	0.3	0.0	1.4	26	67.3	5.1	T	26.2	9.4	29	56	104	202	
8-18	7270.0	150419	78	575	14	0.9	0.2	0.0	2.9	17	42.4	2.9	T	16.9	4.0	16	24	59	120	
9-24	37.0	150673	77	28	0.7	1.6	0.3	0.3	4.9	51	254.9	2.7	0.1	71.7	29.4	55	80	299	543	
10-15	1850.0	150823	58	60	3.6	0.1	0.1	0.1	6.4	24	174.0	3.4	0.1	45.8	17.4	31	36	186	345	
11-3	83.0	150984	55	26	1.3	1.5	0.2	0.1	7.6	60	371.3	2.6	T	96.3	40.9	68	84	409	716	
12-8	159.0	151234	38	17	1.1	1.0	0.2	0.1	9.4	90	471.3	3.8	T	125.9	53.5	85	100	535	931	
1960																				
1-13	818.0	151463	51	244	7.3	0.7	0.2	0.1	8.7	42	240.9	3.9	T	63.7	26.9	53	72	270	482	0.2
2-11	3770.0	151645	42	360	9.2	0.3	0.2	0.0	6.2	25	135.8	5.0	T	36.3	14.3	28	32	150	282	0.1
3-9	363.0	151834	34	51	3.0	1.5	0.2	0.1	7.3	77	406.7	3.7	T	100.1	46.1	89	100	440	802	0.1
4-13	1130.0	152068	59	60	1.7	0.2	0.2	0.0	5.2	27	133.5	2.3	T	36.9	14.0	32	40	150	294	0.1
5-11	2460.0	152264	57	48	2.3	0.6	0.2	0.0	4.4	36	143.2	4.1	T	38.8	14.8	37	35	158	328	0.2
6-15	1350.0	152522	73	460	11	0.9	0.2	0.1	11.4	16	114.8	7.2	T	36.1	12.2	25	46	140	244	0.3
7-12	3000.0	152783	75	77	5.8	0.3	0.1	0.0	15.6	24	60.3	4.3	T	21.8	6.0	28	40	79	211	0.5
8-10	1490.0	153033	78	167	8.5	0.7	0.2	0.1	3.2	19	123.4	1.6	0.1	36.2	13.7	28	52	147	248	0.1
9-14	271.0	153276	73	51	5.7	1.5	0.1	0.1	4.0	14	133.7	4.3	T	37.4	14.2	47	79	152	297	0.1
10-18	24.0	153490	67	16	0.6	0.8	0.2	0.1	2.6	41	251.6	1.3	T	73.5	30.4	57	112	309	555	0.2
11-3	23.0	153596	56	9	0.7	1.0	0.2	0.3	1.5	92	558.7	4.4	0.1	154.0	65.9	111	184	656	1149	0.0
12-7	442.0	153823	45	90	5.2	2.0	0.3	0.3	7.6	170	266.8	4.5	T	71.7	25.7	125	36	285	712	0.0
1961																				
1-17	195.0	154061	36	15	1.2	1.9	0.2	0.1	9.7	140	497.2	7.1	0.1	126.2	56.8	125	100	549	1055	0.2
2-15	2850.0	154196	36	400	12	1.2	0.2	0.1	5.9	86	187.0	7.4	T	47.1	20.2	70	32	201	464	0.2
3-9	8450.0	154355	52	240	5.1	0.5	0.1	0.1	7.1	17	97.9	4.4	0.1	24.2	8.4	29	28	95	216	0.1
4-6	960.0	154612	53	44	1.8	1.0	0.2	0.1	6.8	44	261.7	2.8	0.1	67.0	27.4	53	60	280	503	0.1
5-12	32300.0	154795	62	117	4.0	0.1	0.1	0.0	6.2	6	40.7	2.1	0.1	12.6	3.0	15	24	44	108	0.3
6-15	2790.0	155082	73	138	5.7	1.2	0.2	0.1	5.5	32	141.1	2.4	T	41.5	14.1	37	48	162	312	0.1
7-12	89.0	155305	77	41	1.9	3.6	0.2	0.3	4.5	66	653.7	3.2	0.1	168.0	71.0	84	120	712	1175	0.1
8-15	4020.0	155524	76	125	4.5	0.3	0.1	0.1	5.6	8	37.2	2.7	0.2	12.7	4.4	12	24	50	104	0.4
9-13	740.0	155692	80	30	2.4	2.0	0.2	0.1	2.7	10	87.6	4.3	0.1	27.0	9.8	22	48	108	189	0.2

BLACKBERRY CREEK NEAR YORKVILLE

Blackberry Creek rises in the Bloomington Ridged Plain—North, southwest of St. Charles, and flows southerly to Yorkville where it joins the Fox River. The gaging station is 2 miles north of Yorkville, and the elevation of the gage datum is 612.34 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 69.4 square miles.

The tabulation of water quality data is for the period from October 10, 1961, to September 6, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 are shown, but no duration curve of average daily flow is available for comparison.

Annual rainfall during the period of sample collection was from 6.16 inches above normal to 11.59 inches below normal, based on records for one station within the drainage basin. The average annual departure was —2.37 inches.

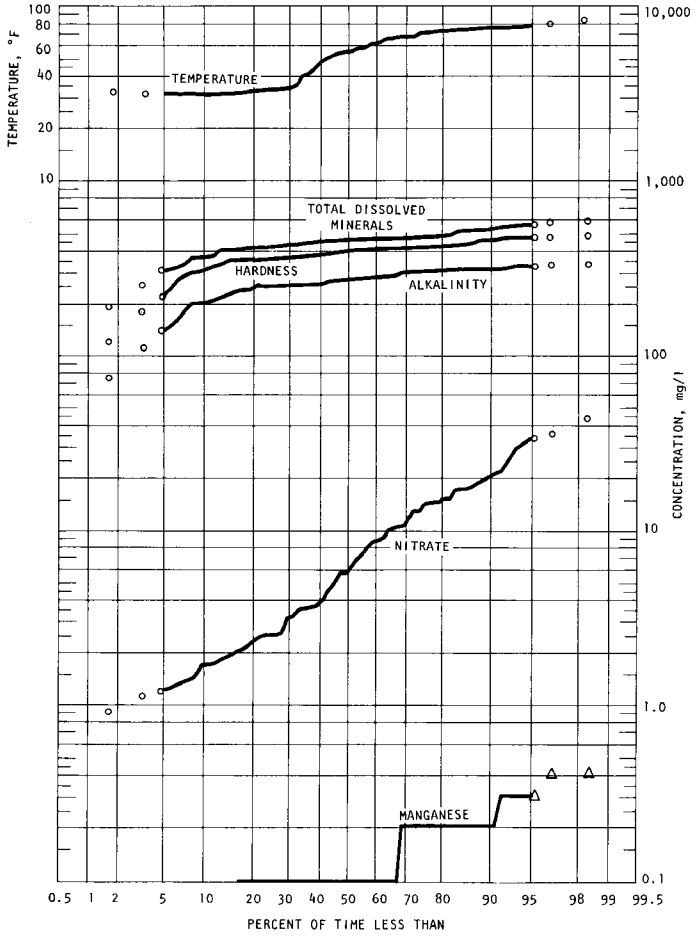
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.7 cfs/sq mi and was not less than 0.083 cfs/sq mi, with a median flow of 0.28 cfs/sq mi.

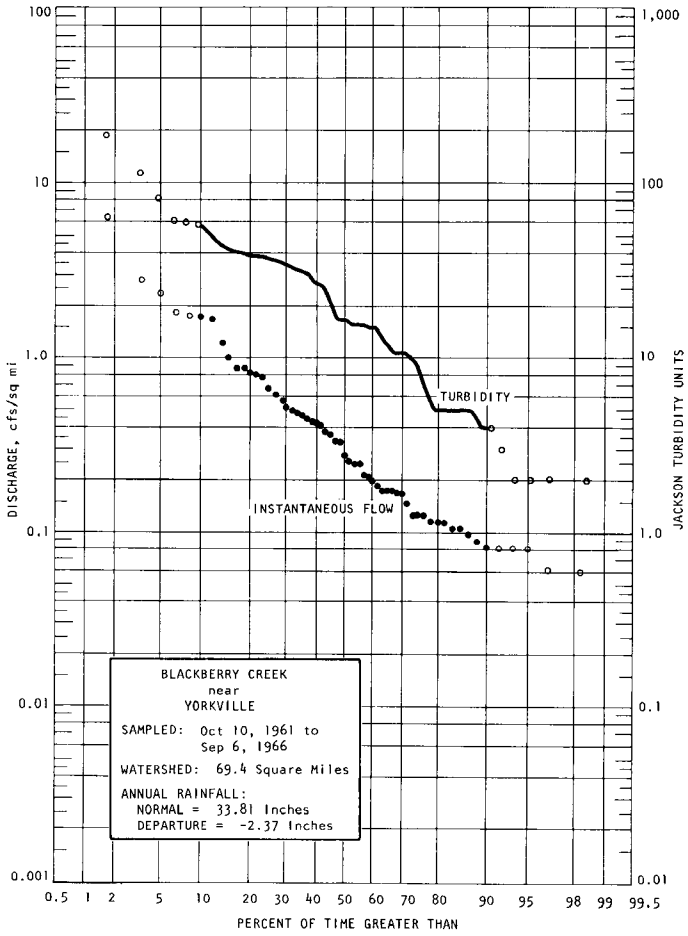
The turbidity was not less than 4 Jtu nor more than 60 Jtu for the central 80 percent of the time, with a median value of 15 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 25 percent of the time. They were below 50 F for 40 percent and below 40 F for 35 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	200	270	310
Hardness (as $CaCO_3$)	300	400	450
Total dissolved minerals	420	460	530
Nitrate	2.2	5.9	20
Manganese	T	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
19 61																				
10-10	45.0*	155851	68	84	4.6	0.3	0.2	0.1	13.5	10	110.3	11.9	0.1	109.0	37.8	5	292	428	480	0.4
11-1	127.0	156096	50.5	39	2.8	0.1	0.1	0.1	10.7	11	116.2	21.8	T	99.6	40.6	3	268	416	450	0.2
12-4	57.4	156232	52	28	1.5	0.1	0.2	0.1	9.0	10	118.5	12.9	T	99.6	43.4	10	300	427	498	0.2
1962																				
1-16	28.8	156490	32	5	0.4	0.1	0.3	0.1	9.8	9	107.4	8.6	0.1	99.0	43.4	4	304	426	490	0.1
2-8	34.5	156700	32	5	0.4	0.0	0.2	0.1	8.7	16	115.6	10.4	T	107.6	47.7	5	324	465	508	0.0
3-5	25.7	156954	32	2	0.4	0.0	0.2	0.1	8.6	10	106.8	10.1	T	99.2	43.0	4	300	425	469	0.0
4-10	164.0	157358	47	11	1.2	0.1	0.2	0.1	1.8	14	92.8	17.3	T	78.9	32.2	7	216	330	381	0.1
5-8	118.0	157458	58	40	2.5	0.2	0.1	0.1	8.5	6	86.8	14.6	T	77.9	27.2	14	226	307	378	0.3
6-7	31.4	157804	73	38	2.4	T	0.1	0.1	12.4	10	104.1	10.5	0.1	96.1	42.9	2	290	417	454	0.2
7-3	34.3	158000	74.5	62	3.4	0.2	0.2	0.1	12.8	17	99.8	6.1	T	88.0	39.9	10	272	384	437	0.2
8-10	12.2	158409	75	16	0.9	0.1	0.1	0.1	9.6	11	102.0	2.0	0.1	83.9	44.9	10	284	395	430	0.1
9-7	7.4	158618	65.5	59	3.4	0.2	0.1	0.3	13.2	10	110.9	3.2	0.1	96.1	46.1	4	308	430	460	0.2
10-5	8.2	158786	62	41	1.8	0.1	0.2	0.1	12.1	8	130.7	3.5	0.1	90.2	47.5	0	300	421	442	0.2
11-8	9.3	159035	43	5	0.3	0.1	0.1	0.1	6.6	8	96.1	2.1	0.1	76.2	43.7	5	268	370	419	0.1
12-7	6.9	159176	33	9	0.4	0.1	0.2	0.0	9.4	13	111.9	3.5	T	92.6	49.2	4	304	434	490	0.1
1963																				
1-3	8.3	159389	32	2	0.3	0.1	0.2	0.0	9.3	11	98.1	5.7	0.1	91.6	37.0	21	304	381	475	0.0
2-8	5.7	159532	33	2	0.3	0.1	0.2	0.1	12.6	8	102.2	5.1	0.1	92.3	45.0	8	312	416	484	0.2
3-4	23.9	159731	32.3	41	1.5	0.2	0.1	0.0	8.2	10	67.7	20.1	0.1	52.2	23.0	9	144	225	313	1.7
4-5	15.4	159973	58.5	5	0.4	0.1	0.2	0.0	5.7	13	123.2	3.4	0.1	84.7	42.6	12	264	387	457	0.0
5-9	36.3	160198	76	32	4.2	0.2	0.2	0.1	9.0	12	136.8	17.8	0.1	95.6	37.2	8	236	392	478	0.2
6-6	17.3	160400	84.5	11	1.0	.12	0.2	0.2	9.3	10	104.5	7.4	0.1	86.1	41.5	8	276	386	464	0.1
7-12	7.6	160752	78.5	17	1.1	.12	0.2	0.1	9.0	9	115.4	1.4	0.1	88.0	46.5	6	292	411	467	0.2
8-13	8.8	160942	71.5	26	1.1	.18	0.2	0.1	10.3	10	105.1	2.5	T	78.7	44.6	6	268	380	426	0.4
9-16	5.7	161317	74	16	0.9	.10	0.3	0.1	8.5	13	93.4	3.7	0.1	78.8	42.8	2	260	373	402	0.2
10-11	4.4	161445		36	0.8	.11	0.2	0.1	8.9	8	99.8	1.7	T	82.3	46.0	3	284	395	410	0.5
11-15	5.8	161711		10	0.7	.09	0.2	0.2	10.5	9	98.1	1.3	0.1	84.0	45.0	6	292	395	448	0.0
12-2	6.3	161819	34	4	1.0	.09	0.2	0.1	10.1	10	105.9	2.5	T	92.0	46.5	4	304	421	467	1.0
1964																				
1-10	5.7	162034	31	2	0.1	.04	0.2	0.1	8.8	11	104.1	1.8	T	96.4	48.4	3	320	440	481	0.0
2-3	10.1	162143	32.5	5	0.4	.12	0.2	0.2	8.7	9	98.5	3.9	T	83.7	40.0	3	262	374	403	0.1
3-2	12.4	162366	34.5	4	0.5	.12	0.2	0.0	4.8	10	79.8	1.7	T	60.0	31.6	10	204	280	329	0.0
4-9	62.0	162725	40	16	1.1	.11	0.2	0.1	9.2	13	161.1	35.7	0.1	105.3	38.8	9	228	423	523	0.1
5-11	30.4	162868	65	37	2.4	.06	0.2	0.1	4.0	15	133.1	14.2	T	102.0	42.6	2	264	430	486	0.0
6-18	88.6	163399	74.5	115	7.0	.43	0.2	0.1	12.4	18	94.0	43.7	0.0	86.9	31.3	6	200	346	421	0.2
7-14	13.2	163493	76	22	1.1	.10	0.1	0.1	7.2	12	112.9	1.2	T	80.0	41.5	14	264	370	417	0.3
8-14	9.1	163797	63.8	19	0.9	.17	0.2	0.1	11.4	14	111.9	0.9	T	83.4	43.0	11	272	385	429	0.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-14	4.3	164388		27	1.9	.15	0.2	0.1	10.4	12	107.0	2.4	T	80.8	43.4	14	280	380	467	0.2
10-6	11.9	164530	54.5	43	2.7	.06	0.2	0.1	10.2	14	151.4	4.8	T	112.4	46.8	15	324	472	546	0.3
11-16	12.8	164751	55	13	0.9	.13	0.3	0.1	4.5	12	109.4	1.9	0.1	90.0	42.7	14	300	403	453	0.2
12-10	13.8	164848	31.8	16	0.7	.07	0.2	0.4	10.5	12	143.2	4.5	T	112.0	49.6	6	328	483	536	0.0
1965																				
1-5	131.0	164988	32	46	3.4	.14	0.2	0.1	5.8	14	114.8	34.0	T	66.7	32.7	15	168	301	379	0.5
2-8	452.0	165311	32	51	2.6	.08	0.2	0.0	5.1	9	39.5	15.5	0.0	32.4	10.2	8	76	123	194	0.8
3-1	205.0	165312	33	193	13	.44	0.1	0.0	6.6	19	49.2	14.6	0.0	49.5	14.7	8	112	184	265	1.1
4-19	69.2	165714	59	17	1.4	.22	0.3	0.2	7.1	17	127.3	12.9	0.0	81.6	43.9	12	244	384	457	0.1
5-3	54.0	165818	68	14	1.0	.21	0.2	0.2	5.9	16	127.5	15.5	0.0	86.4	40.0	18	252	380	474	0.0
6-7	30.8	166272	72.5	34	2.2	.17	0.2	0.1	10.4	15	107.3	10.0	T	84.8	37.6	16	260	366	448	0.2
7-14	11.8	166626	80	31	2.7	.24	0.2	0.1	12.2	13	109.0	1.1	T	75.2	41.4	14	252	358	426	0.2
8-11	14.8	167041	75	39	3.6	.27	0.0	0.2	12.4	23	122.0	3.6	0.0	87.4	38.4	21	260	376	481	0.0
9-8	33.3	167234	68	60	4.6	.26	0.2	0.1	12.1	18	151.8	2.6	T	118.4	47.3	14	336	490	591	0.0
10-4	46.8	167357	54	33	2.4	.06	0.1	0.1	11.0	17	151.8	2.5	T	115.2	48.2	12	328	486	583	0.0
11-4	19.4	167515	50	6	0.4	.02	0.1	0.1	3.4	15	137.6	2.3	T	86.0	48.3	13	276	413	509	0.5
12-7	23.5	168014	35	15	1.2	.01	0.1	0.2	9.2	16	138.6	7.1	T	106.6	36.2	14	324	465	542	0.7
1966																				
1-7	62.1	168058	30	6	0.7	.03	0.1	0.1	9.9	17	142.6	19.3	0.3	101.6	45.8	21	300	442	525	0.5
2-1	17.4	168221	32	3	0.3	.02	0.1	0.1	11.7	16	142.1	9.1	T	111.2	50.0	14	336	483	561	0.2
2-28	40.4	168505	33	11	0.6	.07	0.3	0.1	11.6	13	130.6	8.9	T	102.0	40.3	8	276	420	477	0.0
4-5	42.7	168738	41	5	0.3	.05	0.3	0.1	6.0	15	129.4	8.1	T	92.0	41.5	10	260	400	459	0.0
5-3	125.0	168812	56	17	1.3	.04	0.3	0.0	8.8	15	123.6	28.0	T	98.0	37.8	7	244	400	462	0.0
6-1	58.9	169056	62	15	0.7	.06	0.3	0.1	7.8	14	122.2	17.3	T	96.0	41.5	9	268	410	461	0.0
7-5	26.3	169299	77	36	2.4	.16	0.3	0.0	13.6	12	117.7	6.8	0.0	102.0	42.7	5	296	430	499	0.5
8-8	17.8	169694	74.8	33	3.4	.19	0.3	0.0	10.8	13	113.6	5.5	T	94.0	45.8	1	284	423	460	0.2
9-6	8.4	169799	68	12	0.8	.11	0.3	0.1	12.6	12	106.8	3.1	0.0	86.0	45.8	4	280	403	436	0.2

*USGS average daily discharge

BLUE GRASS CREEK NEAR RAYMOND

Blue Grass Creek rises in the Springfield Plain northeast of Hillsboro and flows southwesterly through Raymond. The gaging station is 4 miles southeast of Raymond, and the elevation of the gage datum is 598.08 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 17.2 square miles.

The tabulation of water quality data is for the period from October 14, 1961, to August 10, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 are shown, but no duration curve of average daily flow is available for comparison. Annual rainfall during the period of sample collection was from 10.22 inches above normal to 11.53 inches below normal, based on records for three stations within the drainage basin. The average annual departure was —1.58 inches.

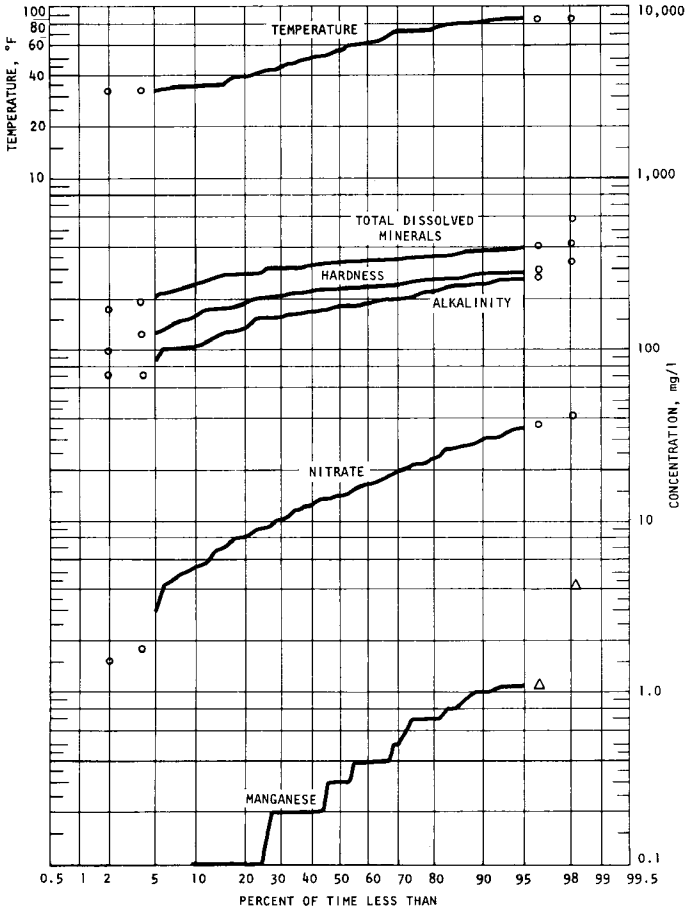
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.56 cfs/sq mi and was not less than 0.0058 cfs/sq mi, with a median flow of 0.058 cfs/sq mi.

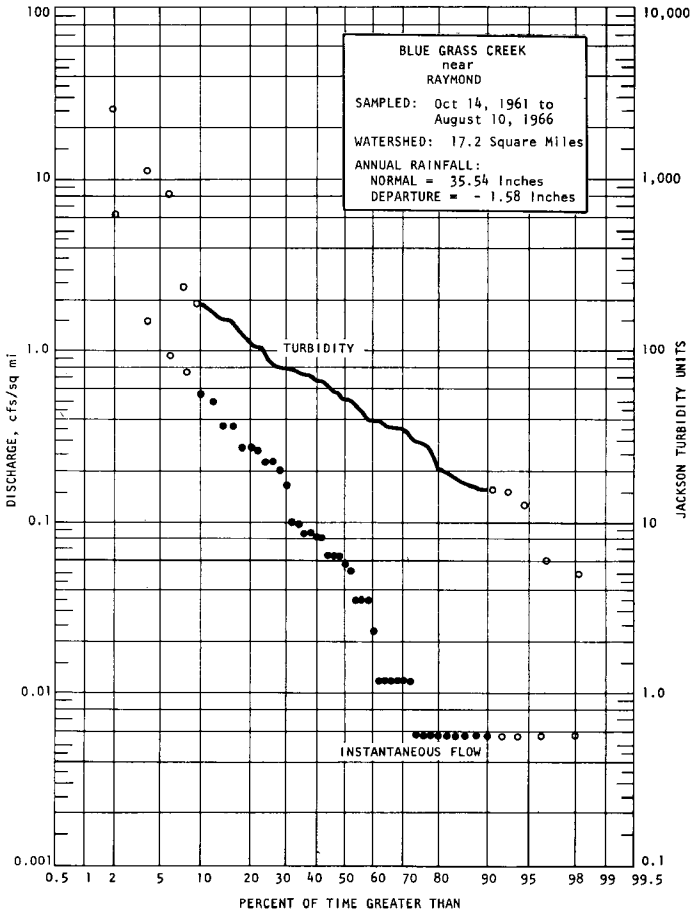
The turbidity was not less than 15 Jtu nor more than 200 Jtu for the central 80 percent of the time, with a median value of 50 Jtu.

Reported temperatures were over 80 F for 20 percent and over 70 F for 35 percent of the time. They were below 50 F for 35 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	110	180	250
Hardness (as $CaCO_3$)	155	235	290
Total dissolved minerals	245	330	385
Nitrate	5.4	14.0	30.8
Manganese	0.1	0.3	1.0





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-14	0.2	155901	61	64	2.5	0.4	0.3	0.0	7.0	11	57.0	4.3	T	57.9	19.9	24	200	227	312	0.3
11-14	1.5	156145	50.5	52	1.2	0.2	0.2	0.0	13.0	11	65.0	12.5	T	54.6	18.4	21	164	212	290	0.3
12-5	4.0	156271	46.5	104	3.1	0.1	0.2	0.0	13.2	15	62.5	17.7	0.1	48.2	16.9	21	136	190	290	0.6
1962																				
1-24	4.7	156558	40	6	0.4	0.0	0.3	0.0	9.7	15	65.0	19.0	T	58.0	20.9	21	172	231	324	0.2
2-8	13.0	156773	40	19	0.5	0.0	0.4	0.1	10.0	11	57.2	19.7	0.1	50.5	18.4	19	152	202	279	0.2
3-20	8.6	157030	43	37	1.0	0.1	0.2	0.1	8.7	14	63.4	26.3	T	53.2	19.2	23	156	212	304	0.2
4-17	6.4	157283	60	43	1.7	0.1	0.3	0.1	8.4	13	64.6	20.8	0.1	51.2	24.3	15	160	328	308	0.2
5-8	4.9	157460	67	13	0.7	T	0.3	0.0	9.9	13	69.3	27.6	0.0	56.8	21.9	23	169	233	318	0.2
6-12	6.4	157797	62	30	1.3	0.1	0.2	0.0	13.9	12	60.3	28.0	0.1	59.3	22.6	27	196	241	355	0.2
7-18	0.6	158176	81.0	18	1.0	0.2	0.2	0.0	13.8	14	57.0	17.2	0.0	66.7	24.3	17	212	267	350	0.3
8-15	0.1	158374	75	67	3.1	0.7	0.3	0.0	14.0	12	51.9	4.9	0.1	65.1	29.2	18	248	283	361	0.3
9-11	0.1	158772	75	117	5.2	0.7	0.2	0.1	10.8	17	86.0	16.8	0.1	60.8	19.9	22	156	244	346	0.6
10-9	0.1	158545	78	77	3.7	1.0	0.3	0.0	12.9	19	70.3	12.5	0.1	62.5	21.3	25	188	234	348	0.7
11-6	0.1	158979	52.6	39	1.4	0.6	0.3	0.2	12.0	17	64.0	13.1	0.1	72.9	25.7	26	244	288	397	0.4
12-4	0.1	159119	53	72	2.3	0.9	0.3	0.0	8.2	22	62.3	10.1	T	73.1	26.3	26	244	291	380	0.4
1963																				
1-8	0.2	159318	36	52	1.9	0.7	0.3	0.0	8.5	16	71.4	10.1	0.1	67.8	23.0	32	228	264	382	0.2
2-5	0.2	159465	36	36	1.5	1.1	0.3	0.1	17.0	25	109.0	37.3	0.1	98.7	42.6	43	336	422	583	1.1
3-8	1.8	159728	48	21	0.9	0.2	0.2	0.1	12.0	14	53.9	31.6	0.1	46.6	14.7	16	112	177	289	1.2
4-3	4.0	159897	57	17	0.7	0.1	0.3	0.0	8.4	15	60.7	21.6	0.2	61.9	21.2	16	176	242	334	3.5
5-14	16.3	160209	66	35	1.3	0.1	0.3	0.0	12.2	14	52.7	30.8	0.1	50.4	18.9	12	132	204	286	0.5
6-11	1.7	160387	74	39	1.5	.19	0.2	0.0	9.5	12	57.0	24.0	0.1	59.2	23.1	19	188	243	345	0.5
7-9	1.1*	160975	86	194	7.8	.84	0.4	0.0	11.7	15	47.5	9.2	0.1	37.3	21.8	28	164	183	288	0.8
7-16	0.1	160659	83	28	1.7	.22	0.4	0.0	8.4	13	64.4	8.8	0.2	56.1	19.6	33	200	221	324	0.8
9-10	No sample taken, no flow																			
10-22	0.1	161486	75	152	3.3	.67	0.3	0.0	12.0	26	94.8	7.9	0.1	61.1	22.6	40	192	246	384	2.0
11-12	0.1	161624	48	79	0.1	1.12	0.5	0.0	5.2	23	41.6	5.8	0.1	64.0	26.0	35	266	267	365	0.7
12-10	0.1	161823	33	16	1.7	.32	0.3	0.1	6.8	20	60.7	8.0	0.1	71.4	29.5	35	278	300	404	1.3
1964																				
1-7	0.1	161986	33	76	4.1	.74	0.3	0.1	12.9	18	58.0	16.3	0.1	67.3	23.2	27	224	264	372	0.3
2-11	0.9	162237	36	58	3.4	.40	0.3	0.0	10.0	20	66.6	13.7	T	63.5	22.8	27	204	253	349	0.6
3-3	1.1	162362	55	47	2.0	.24	0.2	0.0	5.3	12	51.2	8.4	0.1	47.0	13.5	22	144	173	252	0.7
4-8	25.8	162645	44	58	2.2	.16	0.2	0.1	12.6	18	54.3	26.9	0.1	46.6	15.4	22	124	180	288	0.3
5-11	1.5	162867	63	67	4.2	.29	0.3	0.1	7.7	14	57.6	12.0	T	60.9	22.7	14	188	246	329	0.4
6-9	1.0	163136	85	73	3.3	.32	0.4	0.1	13.8	16	57.8	14.3	0.0	61.2	21.6	18	188	242	312	0.8
7-8	0.1*	163559	75	88	5.1	.45	0.3	0.0	8.7	13	54.3	6.8	T	64.5	24.3	31	248	261	349	0.7
8-19	No sample taken, no flow																			

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) Total hardness (as $CaCO_3$)		Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-16		No sample taken, no flow																		
10-14		No sample taken, no flow																		
11-11		No sample taken, no flow																		
12-15		No sample taken, no flow																		
1965																				
1-4	0.1	164992	35.0	104	1.1	.37	0.1	0.2	5.6	21	89.7	18.5	T	52.3	16.2	35	132	197	342	2.1
2-9	3.0	165227	39	150	6.0	.22	0.2	0.2	8.1	12	42.2	10.6	0.1	26.7	7.7	20	72	98	180	0.7
3-17	1.1	165423	57	36	1.8	.16	0.3	0.0	6.7	18	67.5	14.6	0.1	52.8	18.1	33	170	206	304	0.4
4-14	1.1	165669	50	79	5.4	.36	0.3	0.0	6.3	18	68.9	13.6	T	56.4	20.3	31	182	224	332	0.2
5-21	0.6	165988	87	50	3.2	.37	0.3	0.0	10.6	18	66.6	13.6	T	59.6	21.3	33	200	236	338	0.8
6-17	0.2	166286	80	81	5.2	.51	0.3	0.1	8.9	20	65.8	15.5	T	60.4	20.3	31	192	234	338	0.6
7-8	1.4	166552	83	179	5.8	.30	0.3	0.0	10.6	10	35.0	16.7	0.0	31.2	12.2	18	104	128	199	1.2
8-11		No sample taken, no flow																		
9-9	0.1	167233	86	2590	08	4.06	0.3	0.1	7.8	19	49.0	9.4	T	58.5	21.9	33	222	236	344	1.1
10-6	0.4	167343	61	39	1.6	.23	0.4	0.0	6.0	17	46.7	5.4	0.0	56.8	23.0	39	204	236	321	1.3
11-9	0.2	167559	52.5	33	1.3	.82	0.3	0.1	7.9	18	51.0	1.8	T	60.0	24.0	31	236	248	339	1.2
12-7	0.1	167790	34	29	1.3	.37	0.3	0.1	4.4	19	68.7	1.5	T	69.6	27.8	37	268	288	394	1.4
1966																				
1-13	1.4	168102	35	15	0.9	.09	0.3	0.1	10.8	17	65.8	14.6	T	58.5	21.2	25	182	233	331	0.4
2-15	9.6	168348	42	16	0.8	.05	0.3	0.0	11.7	17	59.1	23.0	T	54.5	20.4	18	156	220	310	0.4
3-10	4.9	168515	44	5	0.3	.05	0.5	0.0	9.8	19	64.0	21.6	T	57.9	21.5	25	176	233	328	0.2
4-21	109.0	168764	50	244	1	.27	0.3	0.0	14.6	14	38.5	35.0	0.0	36.6	10.6	12	72	135	224	1.1
5-25	14.0*	169031	64	20	1.2	.04	0.4	0.0	14.6	19	62.7	42.0	0.0	62.0	23.2	22	172	250	350	0.3
6-16	3.5	169119	71	1120	0	1.06	0.3	0.0	10.7	14	38.3	20.0	0.0	42.0	10.9	16	108	150	232	1.0
7-13	0.6	169286	86	134	4.8	.40	0.5	0.1	10.4	18	59.2	11.8	T	67.0	23.8	15	200	265	358	0.4
8-10	0.7*	169736	74	830	5	1.00	0.5	0.1	10.9	14	57.4	7.2	0.0	38.0	15.1	15	104	157	247	0.7
9-9		No sample taken, no flow																		

*USGS average daily discharge

BONPAS CREEK AT BROWNS

Bonpas Creek rises in the Mt. Vernon Hills Region east of Olney and flows southward through Browns to its junction with the Wabash River. The gaging station at Browns is 30 feet upstream from the concrete dam of the Albion municipal water plant, and the elevation of the gage datum is 374.92 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 228 square miles.

The tabulation of water quality data is for the period from December 21, 1961, to August 23, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were generally lower than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 8.55 inches above normal to 14.4 inches below normal, based on records for two stations within the drainage basin. The average annual departure was —5.17 inches.

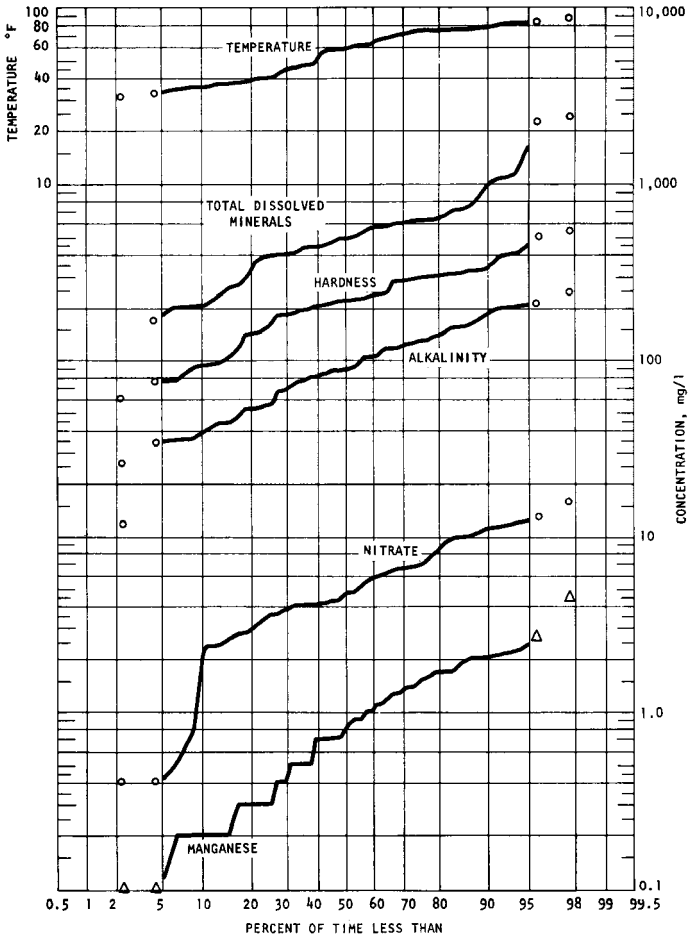
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.2 cfs/sq mi and the minimum was 0 cfs/sq mi, with a median flow of 0.045 cfs/sq mi.

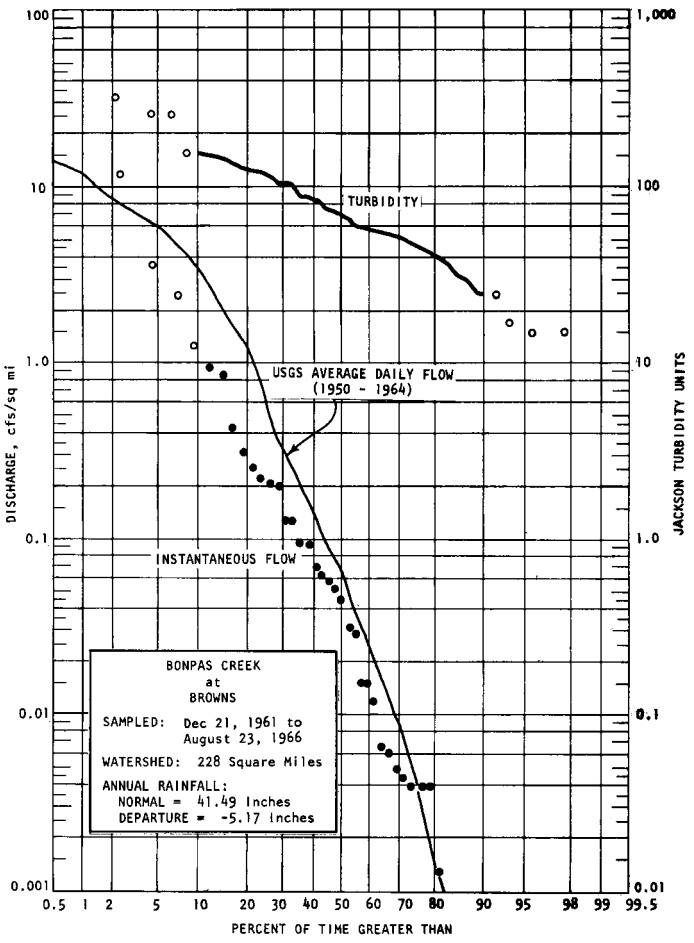
The turbidity was not less than 25 Jtu nor more than 150 Jtu for the central 80 percent of the time, with a median value of 70 Jtu.

Reported temperatures were over 80 F for 10 percent and over 70 F for 35 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	40	90	190
Hardness (as $CaCO_3$)	90	220	340
Total dissolved minerals	205	500	1000
Nitrate	1.7	4.6	11
Manganese	0.2	0.8	2.0





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
10-18		No sample taken, no flow																		
11-15		No sample taken, no flow																		
12-21		No sample taken, no flow																		
12-21	556.0	156337	38.8	43	1.8	0.1	0.3	0.1	10.1	100	89.5	12.3	0.0	39.6	20.9	62	76	185	373	0.4
1962																				
1-23	2660.0'	156614	32	258	1	0.1	0.2	0.0	3.2	6	16.0	4.2	T	5.4	3.0	7	12	26	60	0.2
2-6	129.0*	156702	35	30	1.8	0.2	0.2	0.0	8.7	105	131.2	6.5	0.1	51.0	24.2	67	84	227	447	0.1
3-19	62.0*	157012	48	55	2.2	0.3	0.1	0.0	8.4	60	112.7	6.4	T	50.0	23.1	44	108	220	390	0.1
4-25	14.0	157344	66.5	69	3.2	1.0	0.2	0.1	5.2	135	135.8	5.0	T	65.0	30.5	86	140	288	565	0.1
5-24	2.7	157615	74	86	4.6	1.9	0.2	0.1	7.3	148	71.2	11.0	T	73.6	28.2	83	188	300	556	0.3
6-28	30.4	157917	74	330	3	1.3	0.1	0.i	6.9	48	33.5	6.0	T	24.6	8.4	31	56	96	203	0.2
7-25	1.5	158259	77.5	159	7.6	1.7	0.1	0.1	2.8	98	27.6	2.4	T	23.2	8.8	55	44	94	270	0.1
8-32		No sample taken, no flow																		
9-27		No sample taken, no flow																		
10-18	3.4	158844	61.5	121	6.1	4.5	0.1	0.1	5.1	285	31.5	2.4	0.1	47.5	15.8	155	84	184	643	0.0
11-13	44.7	159022	48	143	6.0	1.6	0.2	0.1	5.4	163	43.2	3.8	0.1	35.3	14.5	83	52	148	413	0.2
12		No sample taken, no flow																		
1963																				
1-24	0.2*	159418	31	101	5.1	0.3	0.1	0.0	6.6	146	123.6	5.9	0.2	52.7	22.4	93	88	224	538	0.0
2-20	3.5	159619	39	15	0.7	0.7	0.2	0.0	3.0	335	214.5	3.6	T	86.8	42.8	194	116	393	964	0.0
3-12	194.0	159762	46	72	3.1	0.3	0.2	0.0	8.5	96	117.0	11.1	0.1	45.7	20.1	63	68	197	407	0.1
4-24	288.0	160088	58	150	4.8	0.5	0.2	0.1	8.0	47	59.9	6.1	0.1	26.4	10.2	36	52	108	236	0.2
5-22	49.6	160251	60	74	4.4	0.7	0.2	0.0	7.4	130	105.5	6.9	0.1	53.1	22.1	86	112	224	510	0.2
6-13	1.0	160402	81	107	5.1	1.70	0.2	0.1	5.1	165	77.5	6.7	0.1	69.6	32.1	103	212	306	630	0.3
7-9	22.0	160618	74.5	259	1	.86	0.2	0.0	5.1	44	49.9	5.4	T	19.3	6.7	57	44	76	205	0.3
8-1	10.3	160845	83	101	4.8	.77	0.1	0.0	5.3	210	44.8	3.9	0.1	29.6	11.2	119	34	120	458	0.1
9-20		No sample taken, no flow																		
10-11		No sample taken, no flow																		
11-7		No sample taken, no flow																		
12-10	0.1	161856	39.5	38	1.5.	1.99	0.1	0.1	5.7	1250	72.2	4.1	0.1	133.8	43.3	662	108	510	2305	0.3
1964																				
1-7	0.0	162012	37	24	1.4	1.98	0.1	0.1	6.0	1350	71.6	4.3	0.1	141.2	47.4	713	116	548	2403	0.2
2-4	1.1	162219	41	55	3.1	.20	0.2	0.1	6.8	270	82.7	3.6	0.1	44.0	17.8	148	36	183	598	0.0
3-2	1.4	162360	47	31	1.4	.22	0.1	0.0	1.6	470	201.2	2.8	0.1	92.0	43.8	245	68	410	1146	0.1
4-15	6.2*	162691	57	64	3.6	.67	0.3	0.1	7.1	130	130.4	5.7	0.1	55.2	25.5	81	96	243	493	0.0
5-7	13.1	162845	69	58	2.9	.95	0.2	0.1	5.9	150	136.6	2.8	T	66.5	31.0	89	132	299	571	0.0
6-2	16.0*	163104	67	133	6.3	.66	0.3	0.0	7.3	114	65.6	9.8	0.1	52.6	21.5	57	108	220	410	0.0
7-7	0.9	163478	77	81	4.5	1.44	0.2	0.1	8.5	98	53.9	4.8	T	57.2	23.3	53	156	239	396	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
19 64																				
8-4		No sample taken, no flow																		
9-4		No sample taken, no flow																		
11-12		No sample taken, no flow																		
12-11	0.2	164813	44	101	6.4	.93	0.2	0.3	5.2	540	101.8	6.5	0.1	72.1	33.3	278	48	317	1084	0.4
1965																				
1-15	0.9	165087	38	15	1.2	.54	0.2	0.3	11.5	395	58.0	0.5	T	47.1	19.3	211	40	197	769	0.4
2-18	47.1	165228	40	50	3.2	.26	0.1	0.0	9.0	148	92.2	9.8	T	46.8	19.0	89	76	195	491	0.2
3-26	57.4	165549	37	53	3.1	.37	0.1	0.1	5.6	225	159.4	10.1	0.1	65.6	31.3	129	80	292	667	0.2
4-21	71.6	165792	65	86	4.3	.52	0.2	0.1	8.1	106	111.7	4.3	0.1	48.0	20.9	71	92	206	442	0.0
5-21	15.8	166012	74	46	1.7	2.73	0.2	0.1	5.5	235	112.5	4.1	0.1	76.0	34.2	133	168	330	712	0.1
6-17	7.0	166325	71	147	6.5	1.48	0.2	0.1	7.0	118	52.2	13.4	0.1	53.2	19.3	68	128	212	443	0.2
7-15	11.6	166653	74	116	6.2	1.29	0.2	0.1	7.5	78	42.6	4.1	T	33.6	14.1	49	90	142	294	0.1
8-19	0.0	167015	75	81	3.4	1.35	0.1	0.1	2.4	260	34.6	4.2	0.1	50.5	20.4	148	120	210	626	0.3
9-14	98.1	167207	70	96	6.7	.26	0.3	0.1	7.5	55	31.9	4.7	T	20.4	9.5	36	54	90	206	0.4
10-7	0.9	167334	57	52	2.5	1.06	0.1	0.1	6.3	225	57.0	2.6	T	55.9	22.7	126	128	233	618	0.2
11-2	0.3	167500	54	66	2.2	2.15	0.1	0.1	6.9	220	43.8	0.4	T	69.0	28.0	125	200	286	613	0.1
12-8	0.2	167821	46	40	0.9	2.12	0.1	0.1	7.2	160	35.6	0.4	T	70.4	30.4	95	244	300	573	0.1
1966																				
1-11	21.0	168098	35	17	0.9	.40	0.1	0.1	10.0	225	137.0	7.4	T	78.2	32.8	132	152	330	729	0.2
2-16	209.0	168293	34	120	5.5	.49	0.1	0.1	8.9	90	107.8	16.0	T	49.3	22.4	57	88	216	403	0.2
3-22	30.1	168596	59	24	2.4	.66	0.2	0.0	4.9	144	163.5	4.1	T	71.0	33.1	96	144	313	593	1.0
4-28	1620.0*	168757	61	117	9.3	.22	0.1	0.0	9.8	27	44.8	8.0	T	19.6	6.6	24	36	76	175	1.2
5-3	814.0	169032	60	51	3.6	.22	0.1	0.1	7.6	44	7.6	3.0	0.2	35.0	13.7	31	80	144	263	1.0
6-15	6.4	169164	70	42	1.9	1.18	0.3	0.1	10.8	90	57.6	9.1	0.1	70.0	28.1	52	208	290	464	0.2
7-27	0.0	169499	88	49	1.4	1.71	0.3	0.1	0.9	192	43.6	0.8	0.4	57.2	24.9	94	132	245	506	0.2
8-23	0.0	169693	80	58	1.8	1.06	0.3	0.1	2.4	184	49.6	3.3	T	40.6	15.4	101	72	165	436	0.2
9-13		No sample taken, no flow																		

*USGS average daily discharge

CACHE RIVER AT FORMAN

The Cache River rises in the Shawnee Hills Region east of Cobden and flows southeasterly through Forman and then westerly. The gaging station is 1.2 miles southwest of Forman, and the elevation of the gage datum is 318.47 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 243 square miles.

The analysis of water quality data is for the period from July 17, 1956, to July 12, 1961; tabulations were made through September 19, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were generally higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 15.11 inches above normal to 11.58 inches below normal, based on records for one station within the drainage basin. The average annual departure was —0.07 inch.

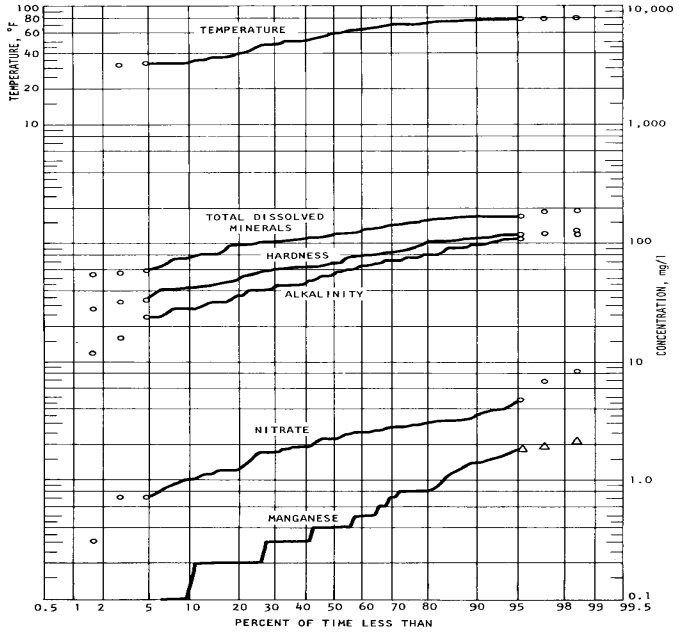
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 5.3 cfs/sq mi and was not less than 0.0062 cfs/sq mi, with a median flow of 0.25 cfs/sq mi.

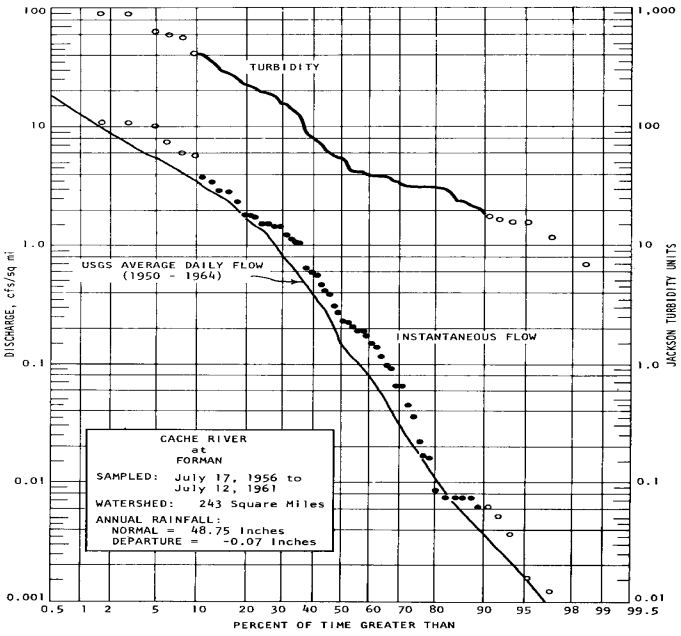
The turbidity was not less than 20 Jtu nor more than 420 Jtu for the central 80 percent of the time, with a median value of 55 Jtu.

Reported temperatures were never over 80 F and were over 70 F for 23 percent of the time. They were below 50 F for 31 percent and below 40 F for 19 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	30	55	95
Hardness (as $CaCO_3$)	40	65	110
Total dissolved minerals	75	120	170
Nitrate	1.0	2.2	3.6
Manganese	0.1	0.4	1.4





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1956																				
7-17	.9	141065		36	1.7	1.4	0.2	0.0	6.3	8	13.4	1.7	T	30.2	8.0	5	92	108	144	
8-14	4.2	141276	80	43	2.1	1.4	0.1	0.2	7.2	7	11.3	2.2	T	19.3	4.9	17	76	64	111	
9-11	1.5	141447	70	84	3.6	0.3	0.2	0.2	7.0	18	18.7	2.2	T	18.4	5.4	18	60	68	134	
10-9	1.8	141630	64	24	1.5	1.6	0.1	0.2	5.8	16	22.6	3.1	0.1	31.8	5.3	16	92	102	168	
11-14	2.1	141908	59	32	2.0	2.1	0.2	0.0	7.3	16	17.7	1.3	0.1	32.4	7.6	17	108	112	169	
12-11	137.0	142110	41	183	7.6	0.4	0.2	0.0	9.1	6	22.0	1.2	0.1	17.2	4.4	5	40	61	96	
1957																				
1-8	8.7	142327	37	24	2.4	T	0.1	0.1	11.2	10	33.7	2.0	0.2	28.7	5.0	10	64	93	169	
2-6	845.0	142562	40	250	6.2	0.4	0.1	0.1	11.2	6	33.7	2.1	0.2	16.7	3.9	5	24	58	122	
3-12	262.0	142859	51	420	8.7	0.5	0.1	T	6.7	7	29.0	2.8	T	19.3	2.8	11	36	60	111	
4-10	2440.0	143103	51	90	4.3	0.1		0.2	5.8	6	13.6	1.6	T	11.5	2.7	4	24	40	62	
5-7	65.0	143305	59	32	3.3	0.7	0.2	0.0	8.8	6	18.3	2.8	T	23.0	3.7	8	60	73	121	
6-11	144.0	143609	75	43	3.7	0.8	0.1	0.2	7.0	4	12.3	3.0	0.1	16.4	2.9	3	40	53	78	
7-10	46.0	143886	74	143	6.1	0.8	0.3	0.4	66.7	5	15.0	1.9	0.1	21.0	2.3	17	76	62	187	
8-6	34.0	144160	72	290	7.9	0.9	0.1	0.0	4.4	4	9.9	2.4	T	13.0	2.5	1	28	43	54	
9-10	0.2	144419	70	54	4.6	1.8	0.2	0.1	6.3	6	11.1	2.7	T	22.7	4.9	6	68	76	113	
10-9	0.4	144717	61	40	2.0	1.3	0.3	0.0	6.0	12	13.6	1.0	T	32.4	6.2	10	96	107	154	
11-15	2690.0	144997	51	56	3.8	0.2	0.1	0.0	6.4	4	11.9	1.0	T	10.6	1.3	0	12	32	55	
12-11	360.0	145261	37	30	3.6	0.0	0.2	T	9.8	5	21.2	1.7	T	15.0	2.5	7	32	48	101	
1958																				
1-9	112.0	145448	33	16	2.0	0.2	0.1	0.0	9.8	6	21.0	2.5	T	19.5	3.4	8	48	63	106	
2-6	372.0	145660	37	40	2.5	0.2	0.2	0.1	9.3	8	30.4	2.9	T	25.0	6.1	0	42	88	116	
3-6	96.0	145923	47	21	2.0	T	0.1	0.0	7.9	10	30.9	1.8	T	23.5	4.4	10	52	77	134	
4-10	360.0	146214	52	44	2.6	0.3	0.1	0.0	7.9	7	23.0	1.1	T	19.2	3.7	7	44	63	100	
5-14	422.0	146681	63	40	3.8	0.4	0.1	0.0	9.4	5	16.2	2.8	T	17.2	3.6	9	50	58	102	
6-19	298.0	146907	70	900	37	1.2	0.0	0.0	6.8	5	15.6	3.1	T	17.0	4.1	3	40	60	95	
7-17	1860.0	147162	74	304	16	0.7	0.1	0.0	8.9	3	15.4	2.6	0.1	12.1	2.5	4	28	41	73	
8-14	448.0	147443	78	210	13	0.5	0.1	0.0	6.2	4	9.1	2.5	T	13.0	2.7	4	36	44	73	
9-24	16.0	147763	70	192	4.7	0.5	0.1	0.0	7.2	4	4.6	2.8	T	19.5	3.4	7	56	63	104	
10-16	11.0	147961	63	76	7.3	0.4	0.1	0.0	6.8	5	17.5	2.9	T	19.1	4.3	9	58	66	108	
11-13	1.8	148208	51	17	1.6	0.2	0.1	0.1	8.9	10	16.4	1.1	T	30.8	6.1	12	96	102	146	
12-10	50.0	148381	32	18	4.9	0.4	0.1	0.1	11.3	8	40.1	2.5	T	23.6	6.1	12	56	84	156	
1959																				
1-24	2690.0	148731	33	155	8.0	0.3	0.1	0.1	6.2	4	14.0	1.7	0.1	11.1	1.2	2	16	33	59	
2-18	721.0	148901	40	155	10.2	0.3	0.3	0.0	8.3	6	24.1	1.2	T	14.9	4.0	9	40	54	97	
3-19	368.0	149159	48	196	9.8	0.2	0.1	0.0	9.1	7	21.8	0.3	T	19.9	4.1	5	44	67	101	
4-15	76.0	149329	59	31	3.3	0.3	0.1	0.0	6.3	9	26.9	0.7	T	26.7	5.4	7	64	89	131	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
5-14	36.0	149644	67	60	5.2	0.6	0.2	0.0	6.6	10	26.7	1.4	T	26.1	2.4	18	71	76	149	
6-29	29.0	149948	78	410	12	0.8	0.1	0.0	6.2	7	18.1	2.4	T	26.4	2.9	12	72	78	115	
7-22	4.0	150143	76	35	2.4	0.8	0.3	0.0	6.9	7	14.2	1.9	T	35.3	7.0	14	122	117	165	
8-19	158.0	150420	77	220	14	0.8	0.3	0.0	9.5	3	14.8	2.2	T	7.4	2.3	11	30	28	81	
9-23	1.5	150670	77	71	7.4	0.3	0.2	0.1	7.6	1	20.6	8.2	0.1	22.5	5.6	8	68	79	141	
10-7	55.0	150820	69	600	32	0.8	0.1	0.0	9.1	6	14.8	3.6	0.1	13.8	4.3	9	44	52	104	
11-4	16.0	150982	56	33	2.7	0.2	0.1	0.0	14.4	7	23.7	0.9	T	24.8	5.8	10	72	86	141	
12-9	22.0	151235	35	12	1.4	0.2	0.1	0.0	9.8	11	24.6	1.7	T	29.5	6.6	15	80	101	167	
1960																				
1-15	1470.0	151462	53	355	15	0.1	0.1	0.0	6.7	4	20.8	1.2	T	13.4	2.1	8	32	42	82	0.1
2-10	696.0	151646	47	122	1.1	0.1	0.1	0.0	8.7	6	32.5	2.3	T	20.0	4.4	9	44	68	113	0.1
3-10	102.0	151833	33	32	0.9	0.4	0.1	0.0	7.5	11	42.4	1.8	0.1	33.7	6.2	14	80	110	166	0.1
4-14	56.0	152069	66	55	2.8	0.3	0.1	0.0	4.6	11	32.1	0.8	T	30.1	5.5	14	80	98	148	0.0
5-12	275.0	152266	54	43	4.3	0.4	0.1	0.0	9.5	5	24.1	1.9	T	19.5	3.6	10	52	64	124	0.5
6-16	43.0	152523	72	900	27	1.5	0.1	0.0	5.6	7	21.2	6.8	0.1	22.4	5.4	11	65	78	132	0.1
7-21	1.8	152829	68	39	2.4	0.5	0.2	0.0	6.6	7	18.9	2.6	T	36.4	7.8	9	112	123	160	0.2
8-17	1.8	153026	79	32	2.4	0.3	0.4	0.0	5.2	15	19.5	0.7	0.1	31.8	5.0	19	100	100	167	0.1
9-14	1.3	153251	66.5	32	3.7	0.6	0.2	0.0	5.6	4	16.5	3.8	0.1	26.4	4.4	8	76	84	120	0.2
10-11	0.3	153425	70.5	7	0.7	0.2	0.2	0.1	5.6	4	14.6	2.5	0.1	37.4	6.5	10	120	120	162	0.3
11-16	255.0	153642	56.5	650	25	1.1	0.2	0.0	5.3	5	22.2	2.2	T	17.0	3.3	9	44	56	93	0.1
12-6	582.0	153762	48	575	33	1.9	0.2	0.2	7.2	4	23.0	4.7	T	12.8	2.4	11	32	42	80	0.1
1961																				
1-10	46.0	153961	35	16	1.2	0.3	0.2	0.0	9.7	9	44.0	3.3	T	25.5	4.6	12	48	83	139	0.2
2-7	24.0	154160	33	22	1.2	0.2	0.1	0.0	8.7	16	44.6	3.9	T	36.0	6.6	22	92	117	190	0.2
2-29	1410.0	154308	44	133	4.0	0.4	0.1	0.0	9.4	7	27.8	3.2	0.1	13.6	2.7	11	28	45	102	0.1
4-4	439.0	154566	50	39	3.0	0.2	0.1	0.0	9.7	7	29.8	3.0	0.1	20.0	3.2	15	52	63	120	0.4
5-18	920.0	154829	65	64	3.7	0.4	0.1	0.0	7.9	2	17.7	1.9	0.1	14.8	2.4	9	44	47	97	0.3
7-12	5.4	155291	79	225	10	0.5	0.2	0.1	5.8	6	15.2	3.1	0.1	25.2	4.1	9	72	80	122	0.1
8-15	15.0	155478	74	78	2.2	0.1	0.3	0.2	7.1	11	21.4	5.6	0.3	29.6	7.3	16	96	104	176	0.2
9-19	1.1	155690	66	42	2.2	0.7	0.2	0.0	6.2	7	15.4	3.4	T	32.4	5.4	10	96	103	155	0.2

COON CREEK AT RILEY

Coon Creek rises in the Rock River Hills Region, northeast of Sycamore, and flows northwesterly to join with the Kishwaukee River. The gaging station is 0.7 miles southwest of Riley, and the elevation of the gage datum is 794.37 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 82 square miles.

The tabulation of water quality data is for the period from October 16, 1961, to September 15, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 are shown, but no duration curve of average daily flow is available for comparison. Annual rainfall during the period of sample collection was from 10.77 inches above normal to 6.78 inches below normal, based on records for one station within the drainage basin. The average annual departure was —0.38 inch.

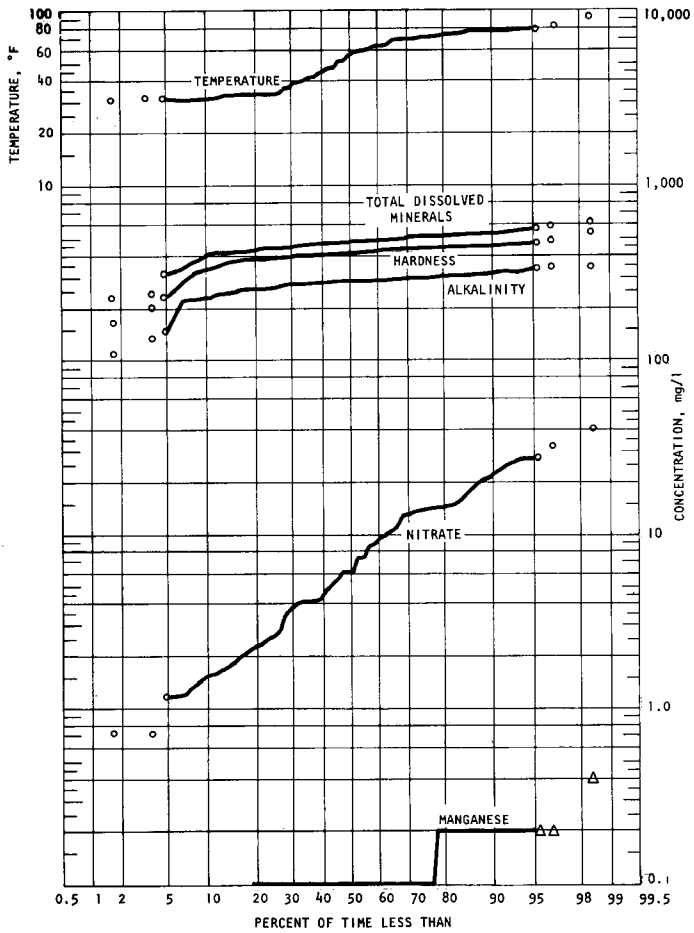
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.05 cfs/sq mi and was not less than 0.052 cfs/sq mi, with a median flow of 0.24 cfs/sq mi.

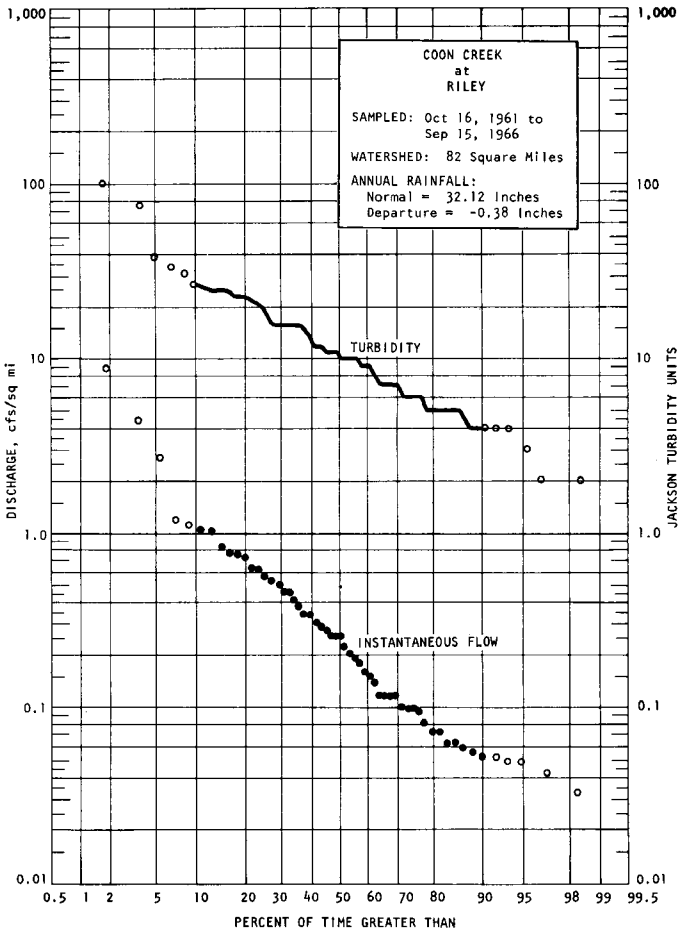
The turbidity was not less than 4 Jtu nor more than 25 Jtu for the central 80 percent of the time, with a median value of 10 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 30 percent of the time. They were below 50 F for 45 percent and below 40 F for 35 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	235	290	325
Hardness (as $CaCO_3$)	335	420	450
Total dissolved minerals	390	480	535
Nitrate	1.5	6.0	23.0
Manganese	T	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-16	37.8	156031	59	4	0.3	0.1	0.2	0.1	8.2	11	106.3	9.7	0.1	105.0	42.4	0	304	437	460	0.1
11-13	61.9	156162	48	5	0.5	T	0.2	0.1	10.1	12	108.0	13.7	T	101.0	41.0	9	300	421	498	0.1
12-15	45.0*	156323	33	4	0.6	T	0.2	0.0	10.8	12	104.5	13.0	T	101.8	43.2	7	312	432	499	0.2
1962																				
1-23	27.9	156584	32	10	0.5	T	0.2	0.0	10.8	13	104.3	10.5	0.2	96.0	38.9	9	284	400	456	0.2
2-12	41.1	156772	33	7	0.8	0.1	0.2	0.1	8.7	11	97.9	10.6	0.4	95.0	40.0	3	284	402	449	0.2
3-20	726.0	157072	36	77	1.4	0.1	0.2	0.1	7.2	7	45.9	13.9	T	51.9	18.0	0	136	204	242	0.8
4-20	69.2	157313	56	3	0.6	T	0.2	0.1	6.5	12	89.7	14.0	0.0	92.1	39.2	2	274	392	419	0.1
5-18	59.8	157554	69	22	0.7	0.1	0.3	0.2	7.2	12	85.4	13.2	T	94.8	38.2	5	288	394	460	0.2
6-15	33.6	157809	74	16	0.7	T	0.1	0.1	10.0	13	91.1	7.4	0.1	95.3	42.6	0	292	410	447	0.1
7-20	22.0	158219	69	11	1.1	0.2	0.1	0.1	8.8	14	90.3	4.1	0.1	89.0	38.8	9	284	382	438	0.4
8-28	6.6	158462	76	25	1.5	0.2	0.2	0.3	11.8	13	98.1	2.6	0.1	90.8	37.5	17	296	381	470	0.1
9-21	6.0	158651	63	9	1.2	0.1	0.2	0.1	8.5	5	103.7	1.5	0.1	85.8	43.0	0	276	391	451	0.1
10-19	7.9	158857	60	4	0.4	0.1	0.3	0.0	7.8	14	102.9	1.2	0.3	88.8	43.0	5	284	399	442	0.3
11-16	9.9	159029	46	16	0.9	0.1	0.3	0.1	9.8	12	101.0	3.9	0.1	80.1	41.5	3	252	371	429	0.2
12-14	8.5	159195	32	7	0.2	0.1	0.1	0.1	12.3	12	126.5	4.1	0.1	112.0	46.5	9	340	471	538	0.1
1963																				
1-4	8.0	159303	33	4	0.2	0.1	0.2	0.1	10.9	9	106.6	4.0	0.1	85.1	41.3	3	264	383	422	0.0
2-13	5.8	159546	32	12	0.6	0.1	0.3	0.1	12.3	14	114.4	6.0	0.1	102.9	42.4	12	316	432	501	0.2
3-15	80.0*	159774	33	16	1.0	0.2	0.2	0.0	8.7	18	73.6	16.7	6.1	57.8	22.5	11	146	237	311	1.1
4-19	15.7	160029	63	11	0.6	0.2	0.2	0.1	4.5	32	94.4	5.1	0.1	91.6	37.5	18	276	383	487	0.5
5-13	21.1	160241	70	15	1.0	0.1	0.3	0.0	3.9	13	102.0	4.9	0.1	73.1	37.9	15	244	339	419	0.1
6-11	51.9	160407	63	23	1.7	.12	0.3	0.3	9.4	14	108.0	27.1	0.1	98.9	38.3	13	280	405	513	0.2
7-18	8.0	160739	93	14	0.6	.12	0.2	0.1	9.6	14	103.7	4.1	0.1	95.3	40.5	8	292	405	468	0.6
8-19	4.5	161045	75	16	1.2	.13	0.3	0.1	10.0	12	107.2	1.7	0.3	96.0	38.9	7	288	400	448	0.3
9-16	4.3	161269	82	10	0.4	.14	0.3	0.0	7.8	11	117.5	2.8	0.1	83.0	44.9	2	256	392	431	0.2
10-14	4.0	161467	67	24	0.5	.09	0.4	0.1	8.4	14	111.9	2.1	0.1	89.2	43.5	5	276	402	447	0.1
11-13	4.8	161620	42	5	0.4	.07	0.3	0.1	11.2	11	112.7	1.2	0.1	99.0	41.5	4	292	418	463	0.3
12-16	4.3	161883	32	6	0.3	.15	0.3	0.2	13.5	12	120.3	2.3	0.0	100.0	44.3	11	296	432	495	0.9
1964																				
1-16	4.0	162014	32	2	0.2	.05	0.3	0.0	11.7	11	124.9	3.6	0.1	107.0	41.2	1	292	437	489	0.1
2-13	9.6	162246	33	2	0.2	.09	0.3	0.1	8.2	11	109.0	2.2	0.4	102.6	42.7	5	312	432	479	0.1
3-9	43.5	162424	39	20	1.3	.17	0.1	0.1	9.1	42	116.2	15.0	T	90.6	35.4	25	234	372	494	0.6
4-13	47.0	162727	58	25	1.9	.10	0.3	0.0	4.6	17	137.4	27.8	0.0	108.0	41.3	5	252	435	496	0.1
5-11	52.6	162952	59	8	1.0	.05	0.2	0.1	5.7	16	126.3	32.2	T	101.6	41.1	2	248	423	460	0.2
6-24	16.8	163365	77	12	1.0	.14	0.3	0.0	12.6	16	130.6	6.0	T	106.4	44.7	1	288	450	492	0.2
7-13	10.2	163542	69	26	1.5	.37	0.2	0.0	13.0	17	108.2	9.9	0.1	98.4	45.7	16	326	434	500	0.9
8-10	5.2	163709	71	18	1.2	.17	0.0	0.1	15.7	12	111.3	2.0	T	97.8	40.1	14	304	409	466	0.9

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCo_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-17	2.7	164283	60	9	0.8	.05	0.1	0.0	10.5	12	120.3	1.8	T	90.0	44.1	11	288	406	470	0.3
10-13	5.2	164502	52	5	0.2	.11	0.2	0.1	6.5	16	121.8	2.5	0.1	95.6	46.8	9	300	431	474	0.1
11-20	14.4	164720	33	5	0.5	.20	0.1	0.1	8.1	22	124.4	0.7	0.9	108.8	42.7	17	324	447	514	1.8
12-9	13.3	164827	33	6	0.4	.17	0.3	0.2	11.4	15	126.9	5.6	T	110.0	42.4	16	328	449	518	0.0
1965																				
1-14	18.0	165001	32.5	9	0.5	.13	0.3	0.1	12.5	19	179.4	14.1	0.1	130.0	53.6	7	336	545	608	0.2
2-9	223.0	165196	33	100	7.1	.22	0.1	0.3	6.0	8	52.0	13.5	1.0	45.5	13.5	9	112	169	237	1.1
3-23	63.5	165522	31	27	2.3	.13	0.2	0.1	8.7	17	122.6	7.4	T	100.8	38.8	8	270	411	497	0.6
4-20	83.7	165716	52	11	1.0	.02	0.2	0.1	6.6	19	125.7	20.0	T	104.0	39.5	9	268	422	518	0.1
5-14	31.2	165931	69	7	0.6	.03	0.3	0.1	6.2	22	134.3	8.9	T	104.0	44.4	11	288	442	534	0.3
6-18	11.9	166315	77	6	0.7	.10	0.2	0.1	10.8	20	140.7	1.6	T	101.6	47.8	8	292	450	544	0.1
7-19	13.0*	166658	77	34	2.2	.19	0.1	0.1	12.6	19	134.1	4.2	0.0	100.8	43.9	14	292	432	512	0.5
8-2	11.0*	166851	74	12	0.6	.15	0.1	0.1	11.9	23	125.5	3.4	T	104.0	40.2	17	296	425	508	0.5
8-16	11.6	167000	77	16	0.7	.04	0.1	0.1	11.4	18	124.2	1.4	T	104.8	42.9	12	308	438	525	0.6
9-24	136.0*	167225		16	0.7	.12	0.1	0.1	12.6	20	132.1	23.0	T	124.0	45.4	5	340	496	587	0.2
10-15	24.3	167369	77	10	0.7	.12	0.2	0.2	8.4	20	133.7	8.6	T	98.4	45.7	15	288	434	514	2.7
11-11	23.4	167557	47	5	0.4	.07	0.2	0.1	7.5	19	137.4	9.0	0.0	108.8	46.7	14	316	464	563	0.9
12-9	27.8	167825	42	7	0.4	.07	0.3	0.1	7.0	20	133.1	11.6	0.0	100.8	46.2	12	290	442	536	1.0
1966																				
1-6	91.0	168032	36	31	1.7	.08	0.2	0.1	5.5	17	71.6	18.4	T	76.0	35.0	11	242	334	392	1.2
2-2	21.2	168203	33	5	0.5	.06	0.2	0.0	12.0	21	140.5	14.2	T	110.0	43.9	13	296	455	530	0.2
3-14	101.0	168524	39	10	1.0	.05	0.3	0.0	8.6	21	125.5	25.0	0.0	110.0	40.3	13	288	440	514	0.3
4-4	85.7	168663	40	4	.37	.04	0.2	0.0	7.5	21	122.4	21.2	T	100.0	41.5	18	284	420	497	0.2
5-13	363.0	168862	44	21	1.4	.04	0.3	0.0	10.0	18	97.7	40.0	T	90.0	33.0	9	220	360	419	0.3
6-6	37.0	169083	72	7	0.4	.04	0.2	0.1	5.3	21	112.5	14.6	0.0	98.0	39.0	8	264	405	458	0.4
7-6	21.2	169212	78	6	0.7	.07	0.3	0.2	9.8	22	119.7	6.0	T	102.0	42.7	12	296	430	524	0.3
8-4	10.2	169539	71	39	1.4	.19	0.1	0.1	1.6	16	39.5	4.8	0.1	60.0	30.0	10	228	273	331	0.8
9-15	3.5	169853	68	23	0.5	.14	0.3	0.1	3.6	29	64.6	0.7	T	72.0	34.9	19	256	323	377	0.2

*USGS average daily discharge

CRAB ORCHARD LAKE AT STATION 5

Crab Orchard Lake was for many years the largest man-made lake in Illinois. Now it is exceeded in size by Carlyle Reservoir, Shelbyville Reservoir, and Rend Lake, which are under construction, and will be exceeded by Lincoln, Oakley, Louisville, and Helm, which are either authorized or planned. Samples were collected at Wolf Creek Road Bridge which is about half the length of the lake east of the dam, and at Station 5 approximately 1.5 miles northeast from the spillway. Sampling from Crab Orchard Lake was discontinued in 1964.

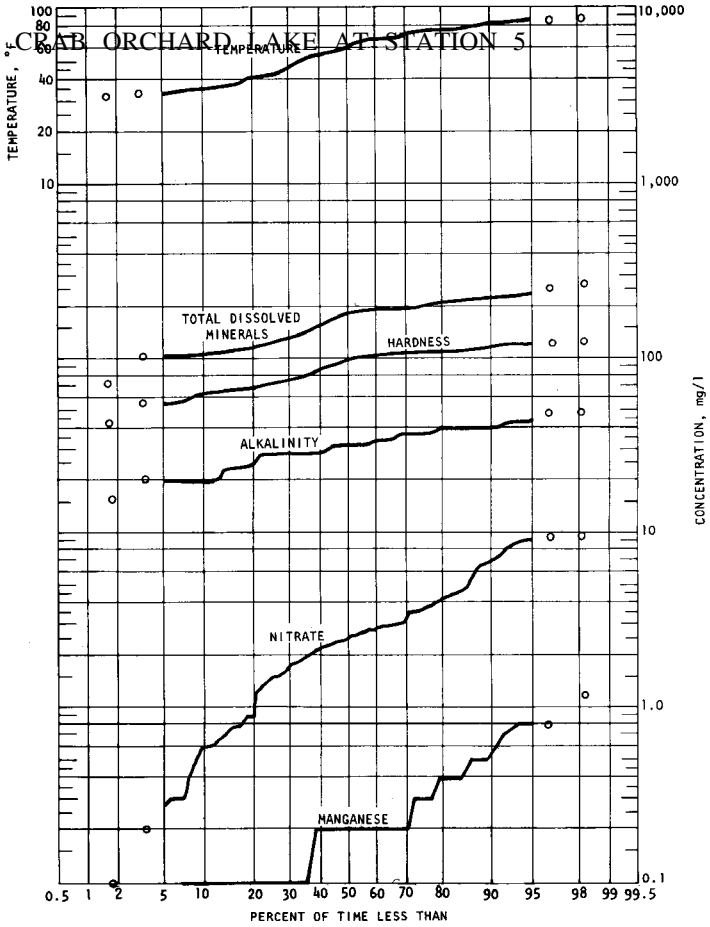
Tabulations of water quality data at Station 5 are for samples collected during the periods from August 9, 1956, to June 9, 1961, and from July 13, 1961, to June 9, 1964. Quality data are also summarized graphically.

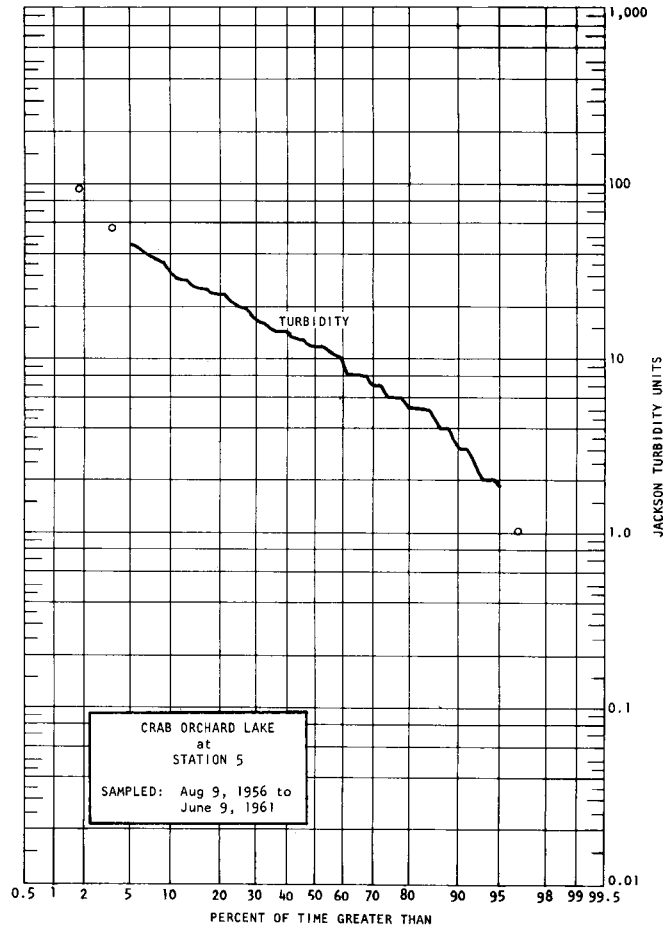
For 80 percent of the time, in the interval between 10 and 90 percent, turbidities did not exceed 30 Jtu (1956-1961) or 38 Jtu (1961-1964), and were not less than 3 Jtu (1956-1961) or 5 Jtu (1961-1964), with median values of 12 Jtu (1956-1961) and 15 Jtu (1961-1964).

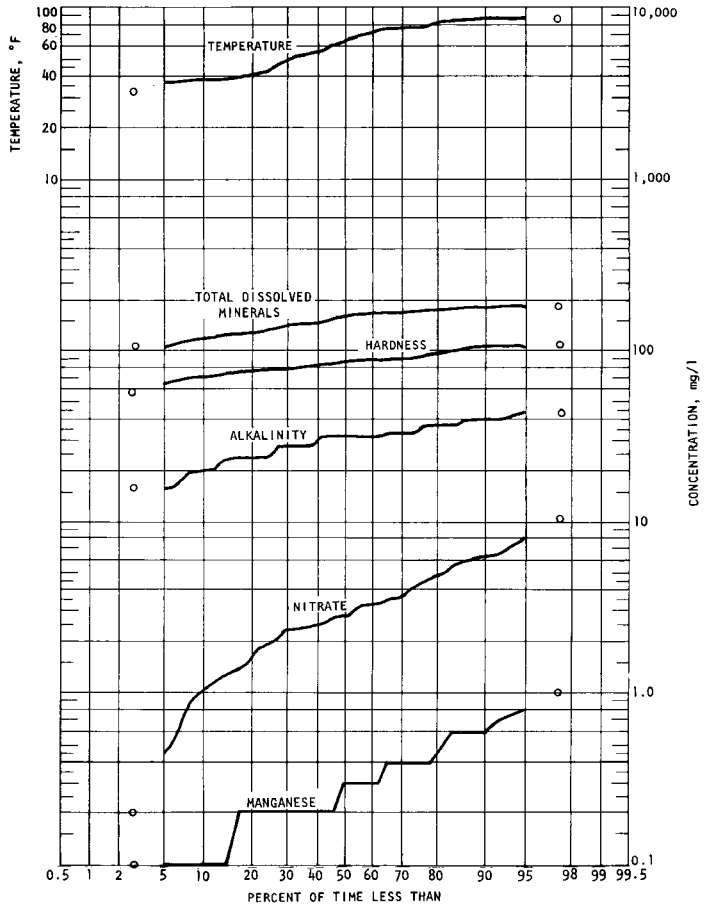
The reported temperatures were over 80 F for 13 (1956-1961) and 22 (1961-1964) percent of the time, and over 70 F for 32 (1956-1961) and 41 (1961-1964) percent of the time. They were below 50 F for 32 (1956-1961) and 31 (1961-1964) percent of the time, and below 40 F for 19 percent of the time (1956-1961 and 1961-1964).

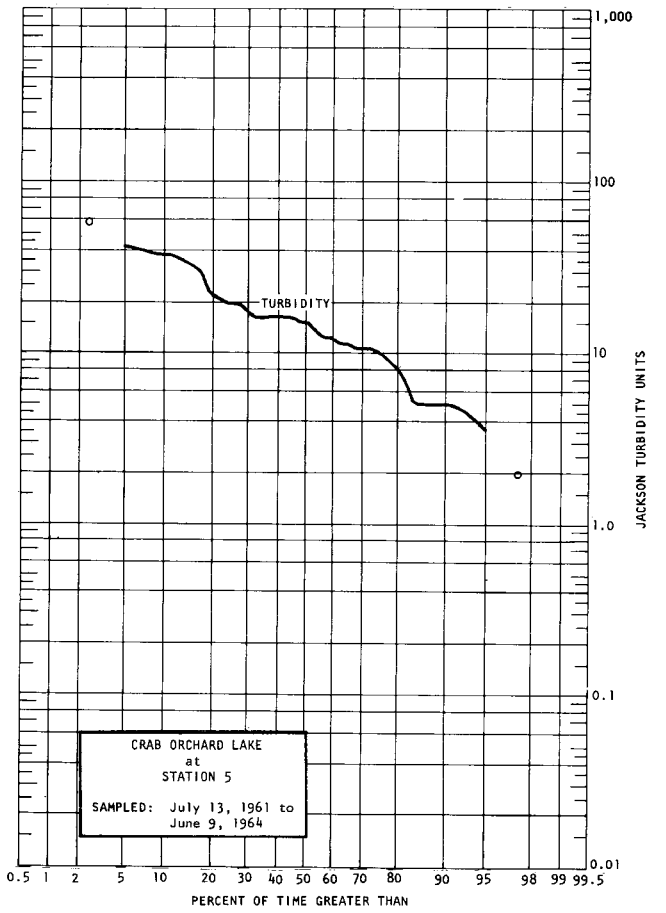
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1956-1961)	20	32	40
	(1961-1964)	20	32	40
Hardness (as $CaCO_3$)	(1956-1961)	63	100	120
	(1961-1964)	65	83	100
Total dissolved minerals	(1956-1961)	110	185	220
	(1961-1964)	120	155	180
Nitrate	(1956-1961)	0.6	2.5	6.8
	(1961-1964)	1.0	2.8	6.1
Manganese	(1956-1961)	0.1	0.2	0.5
	(1961-1964)	0.1	0.3	0.6


CRAB ORCHARD LAKE AT STATION 5
TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
PERCENT OF TIME LESS THAN


JACKSON TURBIDITY UNITS
TURBIDITY
CRAB ORCHARD LAKE
at
STATION 5
SAMPLED: Aug 9, 1956 to
June 9, 1961
PERCENT OF TIME GREATER THAN


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
PERCENT OF TIME LESS THAN


JACKSON TURBIDITY UNITS
TURBIDITY
CRAB ORCHARD LAKE
at
STATION 5
SAMPLED: July 13, 1961 to
June 9, 1964
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature ºF	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
8-9		141241	85	4	0.5	0.2	0.3	0.0	2.6	11	83.9	0.1	0.2	26.0	11.1	13	36	111	175	
9-17		141482	76	13	0.7	0.3	0.3	0.3	2.4	11	84.7	0.2	0.2	23.9	11.1	21	48	106	200	
10-16		141681	69	5	0.6	0.2	0.3	1.0	1.7	12	88.7	0.8	0.1	31.8	10.5	16	48	123	200	
11-6		141844	64	6	0.4	0.1	0.2	0.4	1.5	20	87.4	0.3	0.2	26.1	10.5	23	40	109	194	
12-13		142112	41	0	0.5	0.2	0.2	0.1	1.3	10	89.3	0.6	0.1	25.1	10.4	21	44	106	187	
1957																				
1-24		142441	37	56	2.9	0.1	0.2	0.2	2.2	12	93.4	3.0	0.1	28.2	8.2	24	40	104	192	
2-6		142546	41	1	0.2	0.1	0.3	0.2	1.5	10	84.3	4.7	0.1	25.6	7.8	21	36	96	185	
4-8		143043	53	14	0.9	0.1	0.2	0.2	0.9	8	74.7	1.5	T	21.0	5.7	16	20	76	154	
5-16		143389	72	19	1.5	T	0.1	0.1	2.0	8	61.1	2.4	T	17.7	2.2	22	24	54	136	
6-7		143565	77	39	2.2	0.1	0.1	0.3	3.7	6	43.6	3.5	0.2	17.7	2.9	11	24	57	121	
7-8		143829	80	18	1.3	0.2	0.2	0.2	4.0	5	43.6	4.1	T	16.0	4.0	9	20	57	104	
8-12		144156	85	5	0.6	T	0.2	0.0	2.1	6	39.3	0.6	0.3	20.0	6.7	2	32	78	109	
9-16		144506	74	5	0.6	0.1	0.2	0.1	3.1	7	40.1	1.9	T	16.7	0.1	17	44	61	109	
10-10		144721	66.5	16	1.0	0.2	0.1	0.4	3.4	6	42.4	1.7	T	16.7	6.4	12	40	69	110	
11-18		145047	52	35	2.6	0.2	0.1	0.0	3.2	6	43.2	0.8	T	17.2	5.8	7	28	67	103	
12-9		145232	42	12	0.6	T	0.2	0.1	3.2	6	44.2	0.3	0.5	16.5	5.7	10	34	65	106	
1958																				
1-14		145472	35	15	0.9	0.1	0.1	0.0	4.0	5	21.4	2.1	T	11.1	3.7	2	16	43	73	
1-27		145573	35	23	0.6	0.1	0.1	0.1	4.2	11	47.7	2.4	T	16.0	5.9	10	20	65	107	
2-10		145735	33.5	25	2.4	0.4	0.1	0.0	5.1	7	53.5	3.8	T	17.5	5.8	9	20	68	123	
3-10		145938	40.5	28	1.9	0.1	0.1	0.0	4.3	7	54.9	2.2	T	17.2	5.8	10	20	67	123	
4-2		146145	50.5	23	1.5	0.2	0.1	0.1	2.6	8	65.4	2.8	T	18.2	7.8	9	16	78	123	
5-6		146533	62	25	1.9	0.1	0.1	0.1	10.6	6	72.0	2.2	0.1	19.7	7.9	15	28	82	165	
6-9		146818	79	12	1.1	0.1	0.1	0.0	2.3	6	71.8	9.6	T	23.2	7.3	14	28	88	147	
7-8		147130	77.5	12	1.7	0.1	0.1	0.0	1.5	4	68.5	1.6	T	21.1	7.0	11	28	82	131	
8-4		147350	85.5	3	0.9	0.2	0.1	0.0	2.5	4	57.2	1.8	T	18.7	5.9	8	24	72	142	
9-15		147693	76.5	28	0.6	0.2	0.2	0.0	6.0	6	56.0	3.6	T	18.5	6.8	12	32	74	130	
10-6		147860	68	43	1.0	0.8	0.2	0.0	9.3	5	59.0	2.9	T	18.1	6.4	14	32	72	149	
11-12		148190	53	13	0.8	0.5	0.2	0.1	4.5	8	62.3	2.9	T	17.8	6.9	16	28	73	136	
12-10		148367	32.5	8	0.9	0.4	0.1	0.1	4.2	3	61.7	1.4	T	16.7	6.1	14	29	67	119	
1959																				
1-12		148621	33	7	0.7	0.2	0.1	0.0	3.3	8	57.2	1.8	T	23.7	8.1	4	32	92.8	128	
2-9		148794	37	8	0.5	0.1	0.1	0.0	3.2	4	63.6	0.9	0.1	18.4	7.7	10	28	77	140	
3-18		140090	45	16	1.1	0.2	0.1	0.0	3.3	9	78.0	2.3	T	18.7	9.8	13	24	90	154	
4-6		149258	55	8	0.5	0.1	0.1	0.0	2.3	6	85.2	2.4	0.2	19.1	11.7	16	32	96	188	
5-13		149621	71.5	14	0.7	0.2	0.1	0.0	1.8	8	93.6	2.2	T	22.4	10.7	20	32	100	183	
6-12		149854	78	7	0.4	0.2	0.2	0.1	1.7	10	95.7	1.3	T	24.1	10.1	21	33	102	188	
7-13		150058	82	8	0.8	0.2	0.2	0.1	2.8	11	98.5	1.5	T	26.5	9.6	24	40	106	206	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
8-12		150349	78	5	0.5	0.2	0.3	0.0	3.3	12	100.6	0.9	0.1	26.3	11.2	20	34	112	206	
9-14		150590	67	11	0.6	0.7	0.2	0.0	3.9	10	94.6	6.3	T	27.2	10.5	20	36	111	196	
10-12		150782	68	12	0.6	0.4	0.2	0.0	2.6	10	89.1	2.6	T	24.1	10.3	18	34	103	191	
11-10		150978	49	14	0.6	0.3	0.2	0.0	2.0	9	86.8	3.5	T	23.0	11.3	17	36	104	192	
12-10		151188	38	2	0.3	0.2	0.2	0.0	1.2	9	87.6	2.0	0.0	26.2	9.1	19	40	103	197	
1960																				
1-12888		151422	43	6	0.2	0.2	0.2	0.0	1.6	10	91.9	4.3	0.1	23.9	9.7	20	32	100	190	0.1
2-8		151614	37	23	0.3	0.1	0.2	0.0	2.1	10	93.0	6.2	0.1	25.2	9.7	18	28	103	198	0.0
3-7		151790	34	20	0.4	0.1	0.2	0.1	1.1	10	94.0	9.1	T	25.3	9.8	20	28	104	197	0.1
4-12		152018	56	93	2.4	0.5	0.2	0.0	2.3	13	134.5	8.7	T	32.1	5.5	38	20	103	268	0.1
5-16		152252	57	3	0.7	0.2	0.1	0.0	0.8	11	108.0	7.0	T	29.0	11.6	19	28	120	225	0.1
7-13		152750	85	0	0.2	0.2	0.4	0.1	2.8	12	114.0	4.6	T	29.6	11.4	24	34	121	235	0.2
8-9		152931	82	2	0.6	0.4	0.3	0.0	3.9	11	110.7	4.4	T	20.2	11.2	24	36	119	212	0.0
9-16		153260	75	7	0.6	0.1	0.2	0.0	4.1	9	114.4	9.7	T	29.6	11.7	24	36	122	228	0.8
10-10		153399	66	13	1.0	0.8	0.1	0.1	4.5	12	116.8	3.0	T	29.0	11.8	26	36	121	241	0.2
11-7		153579	66	11	0.5	0.8	0.2	0.1	3.0	10	118.5	2.7	0.1	30.7	11.2	26	40	123	220	0.0
12-13		153791	34	10	0.6	1.2	0.2	0.1	2.2	13	121.2	2.8	T	30.2	12.0	28	40	125	251	0.1
1961																				
1-9		153958		4	0.2	0.5	0.2	0.0	1.3	11	105.3	0.7	0.1	30.5	12.5	17	40	128	239	0.1
2-14		154180	42	20	0.1	0.1	0.2	0.0	0.8	8	88.2	2.6	0.1	22.5	7.9	20	28	89	175	0.1
3-14		154337	50	14	0.6	0.3	0.1	0.1	1.7	13	118.9	2.9	T	28.4	11.4	27	32	118	230	0.0
4-7		154531	55	9	0.6	0.3	0.3	0.1	0.6	9	115.4	2.9	0.1	28.0	10.7	23	28	114	215	0.0
5-5		154749	61	6	0.5	0.1	0.2	0.0	1.0	8	100.4	2.5	0.2	28.4	9.7	18	28	111	207	0.1
6-9			78	Bottle broken in transit																
7-13		155286	83	18	1.4	0.3	0.2	0.0	3.3	4	62.1	2.4	0.1	20.0	6.3	11	28	76	135	0.1
8-7		155392	88	11	0.5	0.1	0.2	0.1	2.0	5	64.4	2.3	0.2	18.2	7.7	14	32	77	144	0.1
9-7		155608	86	2	0.9	0.1	0.2	0.0	3.3	5	65.2	3.2	0.1	19.8	6.9	16	36	78	141	0.1
10-6		155807	66	21	1.1	0.8	0.2	0.1	2.4	5	72.0	3.3	T	20.6	7.4	16	32	82	140	0.2
11-6		156099	56	20	0.9	0.6	0.2	0.0	3.2	5	71.8	2.4	T	22.2	6.2	12	24	81	133	0.0
12-14		156339	38	16	0.8	0.4	0.2	0.1	2.5	6	74.1	2.5	T	20.3	8.0	17	32	84	161	0.1
1962																				
1-15		156442	28	13	0.8	0.3	0.2	0.1	1.9	3	54.5	1.9	0.2	16.8	6.1	10	28	67	129	0.1
2-7		156705	38	31	1.3	0.2	0.2	0.1	3.5	6	84.3	7.8	T	23.6	7.1	16	20	88	167	0.1
3-9		156946	40	59	1.6	0.2	0.2	0.1	3.6	6	69.1	6.1	0.5	17.6	7.3	14	20	74	146	0.1
4-11		157272	54	23	1.5	0.2	0.1	0.0	4.7	6	70.3	10.4	T	18.4	7.3	14	16	76	156	0.1
5-4		157437	71	13	0.8	0.1	0.1	0.0	3.8	5	58.4	6.0	0.0	19.4	6.4	6	16	75	134	0.0
6-12		157806	80	16	1.1	0.1	0.1	0.0	2.1	4	72.4	6.2	0.1	21.6	7.1	12	24	83	139	0.1
7-9		158035	85	14	0.5	0.6	0.3	0.0	2.6	9	72.8	3.5	0.0	21.0	6.7	16	24	80	145	0.0
8-8		158322	85	16	1.1	0.6	0.1	0.0	4.9	7	81.3	2.9	0.1	25.6	7.3	16	32	94	176	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate)) Total Hardness (as $CaCO_3$		Total dissolved minerals TDM	Phosphate (filtered) PO_4
1962																				
9-6		158343	77	20	1.2	1.0	0.1	0.1	4.2	8	72.2	0.9	0.1	21.6	8.3	17	36	88	161	0.1
10-5		158768	76	15	0.7	0.7	0.1	0.1	4.0	6	73.0	1.8	0.1	22.5	7.4	14	32	87	159	0.0
11-3		158977	55	16	0.8	0.4	0.2	0.1	3.7	5	76.3	3.5	0.1	24.6	6.7	15	32	89	177	0.1
12-7		159134	46	5	0.4	0.3	0.2	0.1	3.2	6	77.3	1.3	0.1	23.1	8.3	14	32	92	169	0.0
1963																				
1-7		159312	37	5	0.1	0.1	0.1	0.1	2.6	5	77.1	4.9	0.1	22.4	8.3	12	24	90	150	0.0
2-13		159590	40	4	0.2	0.2	0.2	0.0	1.6	4	60.3	2.0	0.1	18.6	6.2	12	28	72	130	0.1
3-20		159798	51	16	0.7	0.2	0.1	0.0	1.4	7	75.7	2.8	0.1	22.0	7.8	17	34	87	175	0.2
4-16		159980	60	16	0.9	0.2	0.3	0.0	1.1	7	71.2	3.3	0.3	21.1	6.6	17	32	80	159	0.1
5-15		160229	74	12	0.9	0.2	0.2	0.1	1.0	6	69.9	3.8	0.1	20.1	7.2	17	32	80	157	0.0
6-17		160444	76	12	0.8	.22	0.2	0.0	2.0	5	72.4	4.1	0.1	20.6	8.6	16	36	87	158	0.1
7-15		160664	83	11	0.8	.36	0.2	0.2	2.6	8	71.0	2.7	0.1	24.1	6.7	14	34	88	159	0.1
8-16		161029	84	10	0.3	.36	0.3	0.1	3.9	7	72.4	3.4	T	24.8	6.8	15	34	90	157	0.1
9-16		161271	76	15	0.8	.49	0.2	0.0	3.7	7	72.4	1.4	0.1	25.8	7.4	12	36	95	516	0.2
10-14		161444	69.5	9	0.8	.32	0.3	0.0	3.1	7	79.4	2.5	0.1	24.4	9.7	15	40	101	160	0.2
11-19		161686	56	11	0.6	.40	0.3	0.1	3.3	8	78.8	1.5	0.1	26.2	8.9	15	40	102	159	0.1
12-16		161906	37	8	0.3	.35	0.2	0.1	2.7	7	79.2	1.1	0.1	26.4	10.5	11	40	109	167	0.0
1964																				
1-15		162032	39	5	0.2	.20	0.2	0.1	2.2	8	80.2	0.5	0.1	25.6	9.2	17	44	102	175	0.0
2-17		162313	41	5	0.3	.19	0.2	0.2	2.2	7	80.2	2.3	T	26.0	8.8	18	44	101	171	0.0
3-13		162430	48	34	2.1	.23	0.1	0.1	2.4	10	65.8	4.8	0.2	22.2	6.0	18	34	80	144	0.1
4-15		162710	60	41	3.1	.29	0.2	0.0	3.1	4	52.5	5.9	0.1	16.7	3.9	16	28	58	128	0.0
5-13		162962	69	38	2.6	.20	0.2	0.1	3.3	5	53.3	4.5	0.0	15.9	7.3	9	24	70	113	0.1
6-9		163140	78	39	2.1	.30	0.2	0.0	3.1	6	52.9	0.2	0.1	16.1	7.2	10	28	70	105	0.2

CRAB ORCHARD LAKE AT WOLF CREEK BRIDGE

Tabulations of water quality data at Wolf Creek Bridge on Crab Orchard Lake, described under the lake's Station 5, are for samples collected during the periods from July 16, 1956, to June 9, 1961, and from July 13, 1961, to June 9, 1964. Quality data are also summarized graphically.

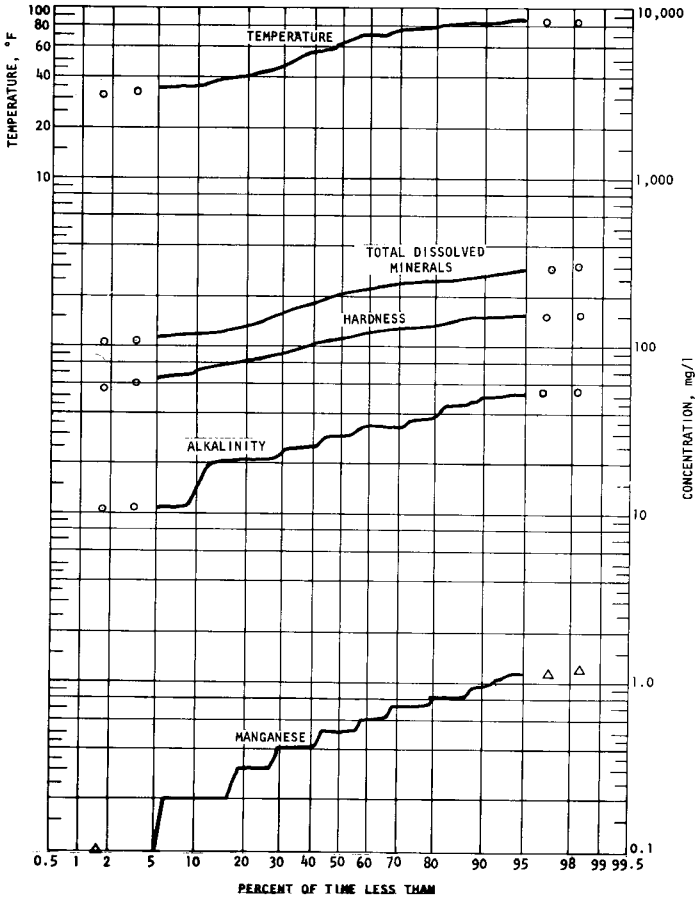
For 80 percent of the time in the interval between 10 and 90 percent, turbidities did not exceed 100 Jtu (1956-1961) or 160 Jtu (1961-1964) and were not less than 5 Jtu (1956-1961) or 7 Jtu (1961-1964) , with median values of 25 Jtu (1956-1961 and 1961-1964).

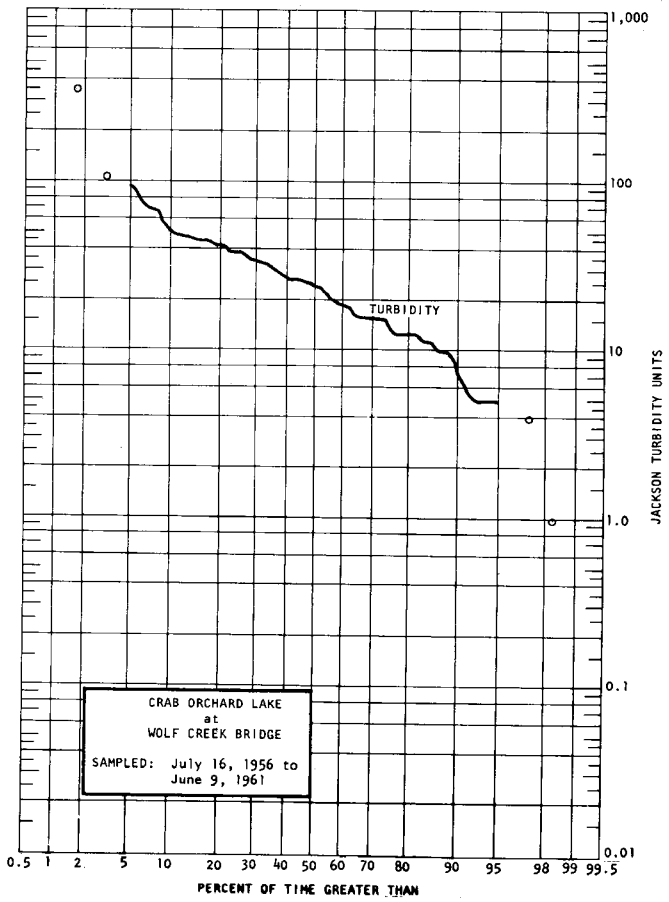
The reported temperatures were over 80 F for 16 (1956-1961) and 15 (1961-1964) percent of the time, and over 70 F for 35 (1956-1961) and 40 (1961-1964) percent of the time. They were below 50 F for 35 (1956-1961) and 31 (1961-1964) percent of the time, and below 40 F for 22 (1956-1961) and 18 (1961-1964) percent of the time.

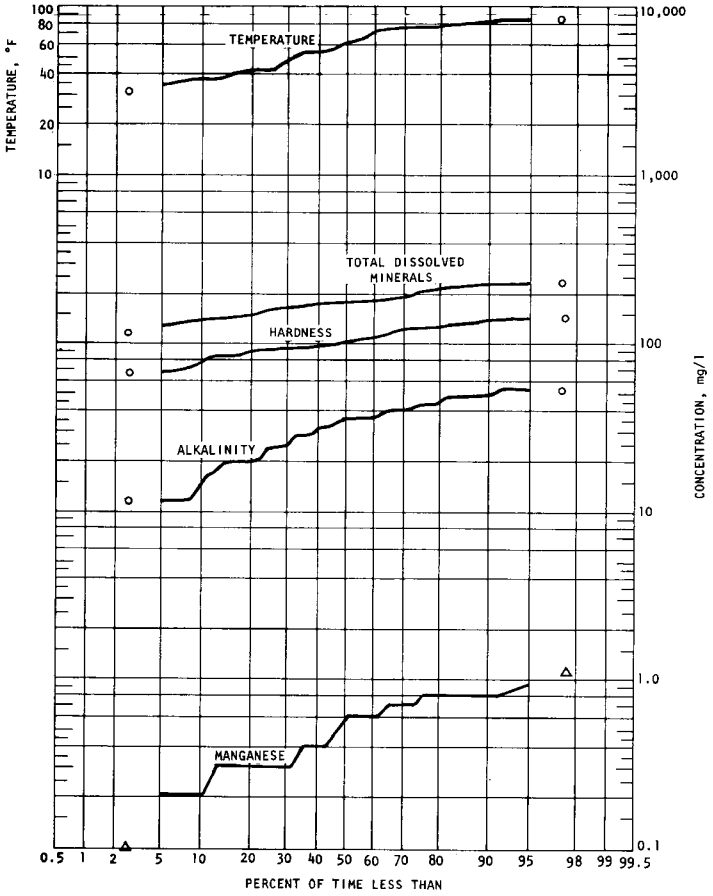
The analyses indicated the following:

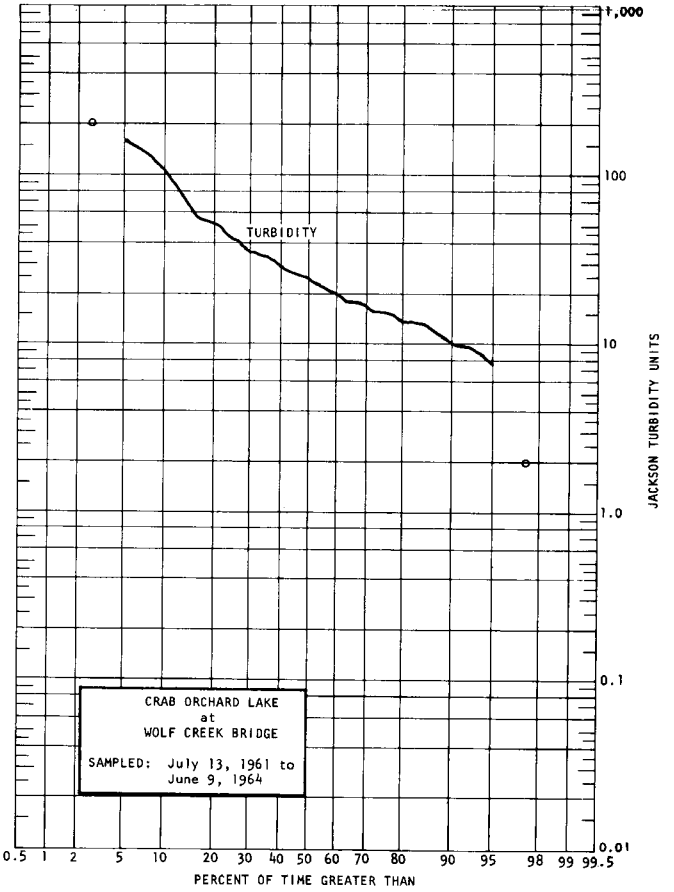
		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1956-1961)	15	28	48
	(1961-1964)	15	36	50
Hardness (as $CaCO_3$)	(1956-1961)	72	110	140
	(1961-1964)	80	110	140
Total dissolved minerals	(1956-l 961)	120	200	270
	(1961-1964)	140	180	230
Manganese	(1956-1961)	0.2	0.5	0.9
	(1961-1964)	0.2	0.55	0.8

CRAB ORCHARD LAKE AT WOLF CREEK BRIDGE









Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-16		141031	82	13	0.6	1.3				13	108.6						48	128	227	
8-9		141240	85	25	1.2	0.9				14	97.9						48	112	214	
9-17		141481	76	16	0.6	0.9				14	102.4						56	132	227	
10-16		141680	68	10	0.5	0.5				14	105.1						48	120	225	
11-6		141845	64	9	0.6	0.3				14	102.0						44	116	210	
12-13		142111	39	13	0.7	0.2				13	100.2						48	120	211	
1957																				
1-24		142440	38	1	0.4	0.1				11	82.1						44	100	179	
2-6		142547	40	39	6.1	0.2				11	90.1						32	104	187	
4-8		143044	54	350	6.7	0.5				6	55.1						20	60	126	
5-16		143390	72	36	1.5	0.4				9	79.2						30	92	158	
6-7		143564	78	43	2.7	0.5				6	45.0						20	54	105	
7-8		143830	80	36	2.2	0.7				7	54.3						30	72	150	
8-12		144155	86	5	0.3	0.2				5	47.7						26	68	109	
9-16		144507	74	13	0.9	0.8				7	56.6						34	94	122	
10-10		144722	67	15	0.8	0.5				8	52.7						36	74	137	
11-18		145048	53	46	1.2	0.4				9	62.9						24	84	129	
12-9		145233	42	46	1.5	0.4				7	59.0						16	76	126	
1958																				
1-14		145471	35	32	1.6	0.4				6	59.2						20	64	120	
1-27		145574	35	16	3.6	0.5				9	83.3						20	89	184	
2-10		145736	34	48	0.3	0.3				7	77.8						20	90	161	
3-10		145939	41	31	1.8	0.6				12	129.4						12	132	242	
4-2		146144	51	49	3.7	0.7				8	95.2						12	96	167	
5-6		146534	62	100	6.8	0.6				7	82.5						32	104	156	
6-9		146817	80	29	1.8	0.6				6	79.6						32	92	152	
7-8		147129	76	27	2.1	0.7				8	91.9						28	100	166	
8-4		147351	85.5	10	0.8	0.5				7	52.5						24	68	117	
9-15		147692	76	39	2.0	1.0				7	58.4						28	76	127	
10-6		147859	66	27	1.2	0.8				6	62.1						28	80	127	
11-13		148189	53	6	0.7	0.2				7	69.9						28	80	137	
12-10		148368	32	12	0.5	0.2				8	73.2						32	84	144	
1959																				
1-12		148620	34	19	1.1	0.2				9	70.5						28	86	140	
2-9		148795	38	43	2.5	0.2				9	102.8						24	108	184	
3-18		149089	44	73	4.0	0.7				12	162.9						20	146	285	
4-6		149257	56	25	1.0	0.3				12	148.1						20	144	259	
5-13		149622	71.50	24	1.7	0.5				12	121.2						32	128	234	
6-12		149853	76.5	19	0.6	1.1				13	125.5						36	127	238	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate)) (as $CaCO_3$)	Total Hardness (as $CaCO_3$)	Total dissolved minerals TDM Instantaneous discharge TDM	Phosphate (filtered) PO_4
1959																				
7-13		150059	81	16	0.7	0.6				14	119.9						36	128	241	
8-12		150350	79	17	0.8	0.7				13	118.1						44	128	248	
9-14		150589	67	22	3.0	0.7				9	78.2						32	92	178	
10-12		150783	66	34	1.6	0.8				10	90.5						20	100	160	
11-10		150979	47	13	1.7	0.3				9	91.9						24	100	170	
12-10		151189	38	5	0.2	0.1				10	99.1						12	108	188	
1960																				
1-12		151423	44	27	1.2	0.6				10	114.8						12	128	208	
2-8		151615	38	70	3.4	0.8				13	151.0						12	148	286	
3-7		151791	33	25	1.4	0.4				12	123.2						20	132	229	
4-12		152019	56	5	0.4	0.1				11	107.0						22	116	216	
5-16		152251	56	12	0.7	0.3				13	133.3						28	96	269	
7-13		152479	84	20	0.9	0.8				12	116.6						32	129	210	
8-9		152930	83	16	1.0	0.7				14	117.9						32	129	244	
9-16		153261	74	28	1.4	1.1				15	129.2						52	150	276	
10-10		153398	68	20	1.1	1.1				12	131.2						46	141	254	
11-7		153580	65	16	0.9	0.6				12	135.4						44	147	266	
12-13		153790	34	39	2.3	0.4				13	131.4						36	138	269	
1961																				
1-9		153959		4	0.5	0.3				12	127.3						32	133	226	
2-14		154181	43	16	0.1	0.5				14	150.4						36	155	300	
3-14		154336	49	106	4.5	0.8				8	126.9						20	120	236	
4-7		154530	53	51	1.8	0.5				8	124.0						24	124	229	
5-5		154748	61	34	1.4	0.4				8	130.8						24	140	236	
6-9		154983	78	44	2.4	0.4				3	59.7						24	72	124	
7-13		155285	79	41	2.4	0.8				4	81.7						28	92	146	
8-7		155391	87.4	16	0.9	0.1				6	76.5						24	96	147	
9-7		155607	86	14	0.3	0.3				6	81.9						40	95	171	
10-6		155806	63	73	4.0	1.2				8	104.7						44	116	193	
11-6		156098	53	18	0.9	0.6				7	110.0						28	119	183	
12-14		156340	37	18	1.1	0.7				10	132.4						16	133	226	
1962																				
1-15		156441	27	26	1.2	0.6				11	137.2						24	135	242	
2-7		156706	37	100	4.6	0.8				4	62.9						12	69	130	
3-9		156947	49	136	6.1	0.4				5	82.3						12	85	153	
4-11		157271	54	56	3.0	0.6				7	92.6						12	98	173	
5-4		157438	74	35	1.6	0.8				8	114.0						20	120	216	
6-12		157807	78	43	2.5	0.3				7	88.0						20	100	166	
7-9		158034	86	16	3.3	0.4				6	84.5						24	92	174	

CRAB ORCHARD LAKE AT WOLF CREEK BRIDGE

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1962																				
8-8		158323		13	0.8	0.3				7	73.4						36	88	162	
9-19		158624	80	36	1.6	0.7				9	82.1						36	98	180	
10-5		158769	75	11	0.8	0.5				7	82.1						40	100	196	
11-3		158976	54	20	1.2	0.4				8	89.1						38	110	171	
12-7		159135	41	16	0.7	0.3				7	79.6						36	96	162	
1963																				
1-7		159313	38	10	1.3	0.3				8	82.5						34	108	170	
2-13		159591	41	23	0.9	0.8				11	107.2						42	126	224	
3-19		159799	54	201	9.4	0.8				7	73.0						20	72	142	
4-16		159981	60	58	1.1	0.5				5	78.6						32	96	170	
5-15		160228	76	14	0.6	0.31				7	94.4						36	108	183	
6-17		160443	77	28	1.6	0.79				9	94.2						40	128	209	
7-15		160663	84	27	1.5	0.73				9	97.7						48	112	198	
8-16		161030	82	22	1.2	0.82				9	84.1						44	112	173	
9-16		161272	75	34	1.8	0.87				10	97.1						48	120	196	
10-14		161443	69	26	1.4	0.59				11	96.1						48	136	206	
11-19		161687	56	21	1.2	0.28				11	97.5						52	128	222	
12-16		161907	36	14	0.7	0.22				11	100.0						48	128	228	
1964																				
1-15		162033	35	8	0.6	0.19				11	95.9						52	132	211	
2-17		162312	42	2	0.5	0.22				12	86.6						52	124	214	
3-13		162431	46	151	7.5	0.67				2	45.0						28	68	118	
4-15		162709	63	32	1.9	0.32				5	81.7						20	88	140	
5-13		162961	70	24	1.9	0.43				7	92.8						36	106	184	
6-9		163139	79	52	2.5	0.57				8	79.0						32	96	149	

CRANE CREEK NEAR EASTON

Crane Creek rises in the Springfield Plain Region northwest of Lincoln and flows southwesterly to its confluence with the Sangamon River. The gaging station is 1.2 miles northwest of Easton, and the elevation of the gage datum is 486.78 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 28.7 square miles.

The tabulation of water quality data is for the period from October 10, 1961, to September 8, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were significantly higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 13.73 inches above normal to 6.57 inches below normal, based on records for one station within the drainage basin. The average annual departure was — 1.03 inches.

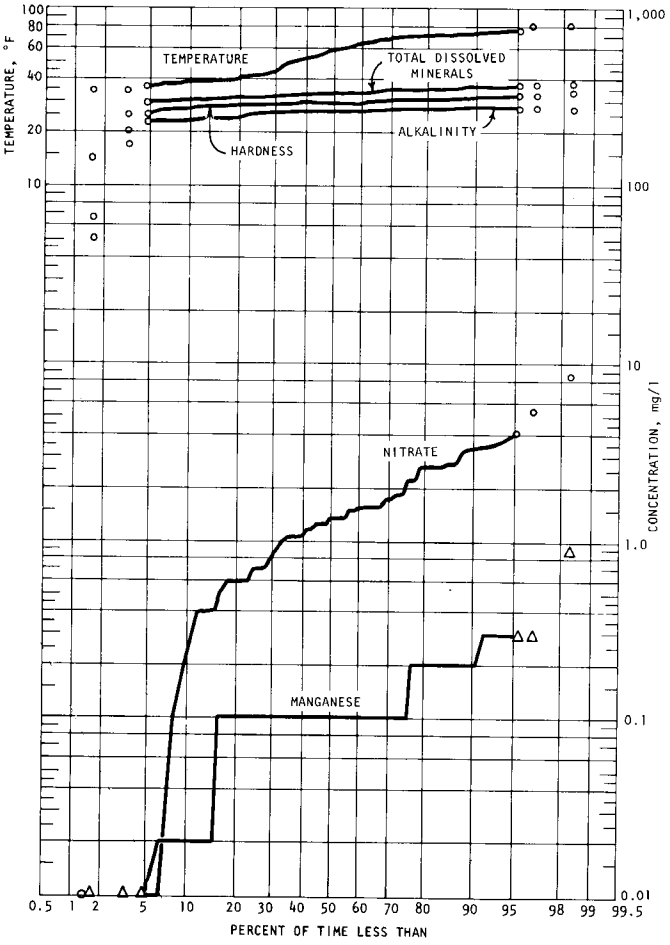
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.63 cfs/sq mi and was not less than 0.13 cfs/sq mi, with a median flow of 0.45 cfs/sq mi. The minimum average daily flow of record was 0.4 cfs in September 1955.

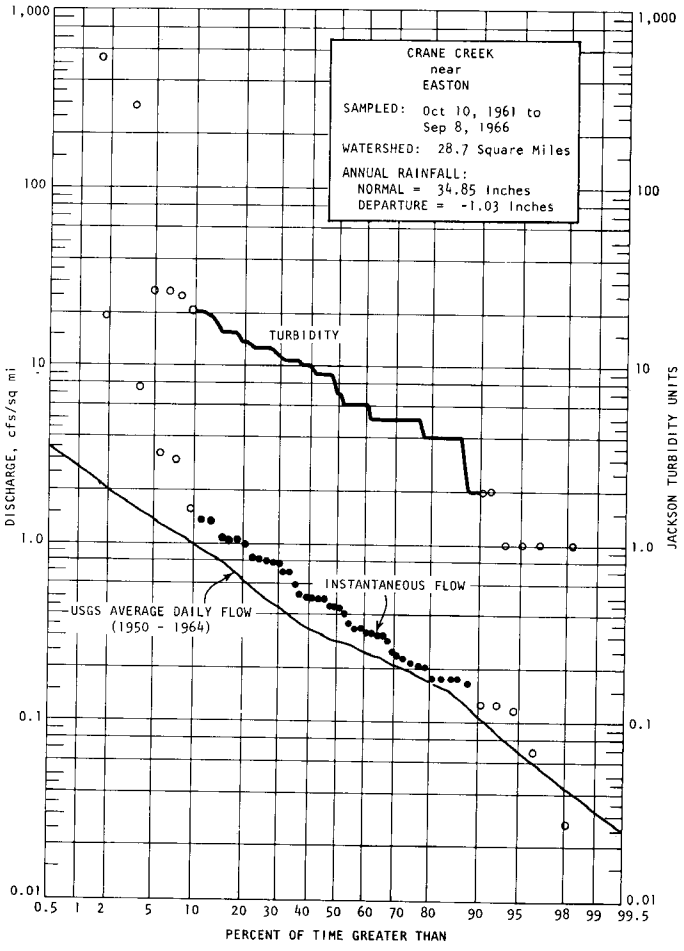
The turbidity was not less than 2 Jtu nor more than 20 Jtu for the central 80 percent of the time, with a median value of 7 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 30 percent of the time. They were below 50 F for 35 percent and below 40 F for 15 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	235	260	280
Hardness (as $CaCO_3$)	280	300	325
Total dissolved minerals	310	340	375
Nitrate	0.2	1.4	3.4
Manganese	T	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-10	19.8	155897	60	5	0.3	0.1	0.1	0.1	20.4	3	46.7	2.7	T	82.9	29.5	1	276	329	353	0.3
11-7	22.2	156151	42	27	2.3	0.2	0.2	0.0	14.1	3	59.0	2.8	T	82.2	29.5	12	284	327	375	0.1
12-15	14.1	156326	40	7	0.7	0.1	0.2	0.0	20.4	3	46.3	2.3	0.0	78.9	31.5	3	280	327	367	0.2
1962																				
1-8	39.7	156494	35	25	1.2	0.2	0.2	0.0	18.8	3	43.2	3.4	0.0	73.0	30.3	2	260	307	345	0.3
2-16	31.1	156778	42	5	0.5	0.1	0.2	0.0	17.6	3	46.3	3.5	0.1	78.0	30.6	1	268	321	346	0.1
3-15	46.7	156965	49	1	0.8	0.1	0.2	0.0	17.4	2	45.0	2.7	0.1	79.0	29.8	2	272	320	340	0.1
4-9	32.7	157296	54	6	1.2	0.2	0.1	0.0	12.3	3	41.8	1.6	0.1	65.0	31.0	1	244	290	316	0.2
5-7	18.0*	157548	66	13	1.2	0.2	0.2	0.1	18.1	3	39.7	1.3	T	72.5	28.8	5	264	300	355	0.1
6-18	14.4	157910	84	20	1.9	0.1	0.1	0.0	16.6	2	40.9	1.3	0.0	69.2	28.5	8	260	290	328	0.1
7-16	5.2	158190	74	5	0.6	T	0.2	0.0	16.4	3	35.0	2.3	0.1	64.4	27.5	6	244	274	318	0.2
8-13	2.1*	158410	74	9	0.4	0.0	0.2	0.0	16.7	1	40.1	1.9	T	64.0	28.7	11	244	278	319	0.0
9-10	3.4	158603	69	2	0.2	0.0	0.2	0.0	16.9	2	44.2	0.6	0.0	70.3	30.6	2	256	302	332	0.1
10-8	9.60	158813	62	4	0.3	0.1	0.1	0.0	19.5	4	64.4	0.6	0.1	84.7	31.9	4	280	343	384	0.1
11-6	6.8*	159007	44	4	0.7	0.1	0.1	0.1	19.3	2	49.4	1.1	0.1	71.9	29.4	5	256	301	337	0.1
12-10	5.9	159202	35	11	0.5	0.1	0.3	0.0	20.8	3	47.5	2.8	0.1	66.4	32.6	13	252	300	344	0.0
1963																				
1-7	6.3	159364	40	5	0.3	0.0	0.0	0.1	18.8	2	44.6	1.2	0.2	74.8	29.9	2	264	310	346	0.1
2-4	5.3	159484	38	1	0.3	0.2	0.2	0.0	18.2	2	46.7	1.6	0.1	76.6	30.0	8	280	315	362	0.1
3-4	314.0	159712	39	544	25	0.9	0.2	0.0	8.2	5	28.6	8.7	0.1	20.7	3.9	12	52	68	147	1.2
4-2	40.2	159944	60	2	0.3	0.3	0.2	0.0	14.6	4	43.6	2.7	0.1	74.0	32.3	2	268	318	342	0.1
5-7	8.60	160219	74	10	0.9	0.1	0.3	0.0	16.0	3	42.4	1.5	0.1	68.3	29.2	8	260	291	343	0.1
6-4	8.4	160385	69	9	1.1	0.1	0.2	0.0	14.0	2	42.0	2.7	0.1	66.1	28.1	21	260	281	326	0.1
7-9	11.0*	160615	68	4	0.5	.05	0.2	0.0	15.8	3	36.4	1.6	0.1	55.8	28.1	9	232	255	307	0.1
8-5	6.8	160993	74	16	1.3	.07	0.3	0.1	17.5	2	33.3	1.4	T	69.1	28.5	0	252	290	299	0.1
9-9	3.6	161219	77	9	0.5	.04	0.3	0.1	17.3	2	37.2	0.4	T	66.6	30.0	0	248	290	302	0.2
10-7	4.5*	161425	72	9	T	.01	0.1	0.1	17.1	4	49.4	0.8	T	70.8	29.9	1	248	300	323	0.5
11-4	5.1	161621	51	1	0.2	.04	0.2	0.0	17.8	2	45.9	0.0	T	72.0	30.6	6	268	306	338	0.0
12-2	5.0	161796	43	2	0.1	.02	0.2	0.1	16.0	3	48.1	0.4	T	76.5	29.8	3	266	314	339	0.1
1964																				
1-6	5.3	162019	40	4	0.3	.32	0.2	0.1	14.8	2	44.0	1.6	0.1	66.0	29.2	1	236	295	309	0.0
2-4	6.6	162240	78	5	0.7	.14	0.2	0.0	16.3	4	47.9	3.3	T	78.4	31.1	5	276	324	354	0.0
3-3	7.2	162419	50	4	0.6	.15	0.3	0.1	16.7	4	45.9	1.6	0.1	77.8	30.5	7	282	320	355	0.2
4-6	30.7	162675	65	11	0.8	.11	0.3	0.3	18.3	4	51.2	3.7	0.1	79.5	25.4	8	260	304	362	0.0
5-4	23.2	162875	72	27	2.1	.14	0.2	0.0	15.1	5	50.0	1.6	T	68.4	28.8	3	236	290	333	0.0
6-1	8.5	163131	70	0	0.4	.07	0.2	0.0	17.8	5	45.5	1.9	T	65.2	30.9	1	236	295	309	0.0
7-7	9.1	163448	73	13	2.7	.13	0.2	0.0	18.0	3	42.0	0.6	0.0	72.1	29.7	1	256	303	325	0.1
8-11	1.2*	163729	71	16	1.3	.09	0.3	0.0	19.6	5	41.6	1.1	0.0	64.4	30.5	10	256	286	329	0.2

Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1964																				
8-31	0.8	164216	83	14	T	.07	0.2	0.0	18.8	4	44.2	1.0	T	64.0	28.6	9	244	277	335	0.2
10-5	2.0	164451	60	6	0.4	.07	0.2	0.0	16.4	4	62.7	1.1	T	78.0	30.0	9	272	318	378	0.2
11-10	3.7	164683	54	6	0.3	.11	0.2	0.0	17.6	3	53.3	0.1	0.1	77.6	29.8	9	276	316	390	0.1
12-2	5.7	164769	37	6	0.4	.12	0.2	0.2	14.1	4	51.2	1.1	T	78.8	29.3	16	284	317	372	0.0
1965																				
1-5	23.0	165002	45	11	0.4	.06	0.2	0.2	13.4	5	56.2	4.1	T	76.8	30.3	11	272	316	382	0.1
2-8	15.0	165171	43	5	0.3	.03	0.3	0.1	13.1	3	45.3	1.4	T	73.5	29.3	9	272	304	335	0.1
3-9	28.1	165429	39	13	1.1	.16	0.2	0.1	18.9	7	48.5	1.3	0.0	82.4	28.8	7	278	324	362	0.0
4-6	219.0	165682	53	295	12	.34	0.1	0.0	4.4	8	35.0	5.5	0.0	56.0	16.9	11	180	209	260	0.1
5-18	13.0	165934	74	5	1.0	.10	0.2	0.1	17.3	6	40.9	0.7	0.0	72.8	28.8	7	264	300	337	0.0
6-9	14.0	166279	63	14	1.5	.10	0.2	0.1	21.2	7	40.9	0.9	0.0	75.2	29.0	9	274	307	344	0.0
7-13	9.2	166659	72	10	0.7	.27	0.2	0.0	13.8	4	36.0	0.0	0.0	69.2	29.4	4	260	294	331	0.0
8-10	3.7*	166991	65	21	1.7	.05	0.2	0.0	16.3	7	35.6	1.2	0.0	68.2	27.6	8	252	283	327	0.2
9-7	10.4	167208	70	12	0.5	.11	0.2	0.1	17.7	6	44.2	0.7	T	80.0	29.9	8	284	322	364	0.0
10-5	22.7	167375	52	6	0.5	.07	0.2	0.0	14.4	5	49.4	1.8	0.1	82.0	30.5	4	280	330	378	0.0
11-2	12.8	167553	45	6	0.4	.12	0.2	0.1	19.0	5	45.3	1.4	T	73.0	28.7	10	268	300	354	0.1
12-7	9.8	167873	40	4	0.2	.07	0.3	0.1	18.6	4	47.3	0.0	T	65.0	29.4	7	244	283	325	0.0
1966																				
1-6	23.3	168029	38	10	0.7	.12	0.3	0.1	19.6	4	48.3	0.5	T	73.0	28.7	7	260	300	361	0.0
2-2	11.7	168204	39	5	0.4	.17	0.3	0.1	18.4	5	45.7	0. 2	T	73.0	28.2	9	264	298	343	0.1
3-18	20.0	168540	52	19	0.7	.10	0.1	0.0	19.5	14	44.4	1.8	T	76.0	28.1	10	260	305	351	0.1
4-19	9.8	168723	57	5	0.6	.12	0.2	0.0	20.2	8	42.0	1.4	T	68.0	29.3	11	252	285	340	0.1
5-9	12.7	168870	56	5	0.7	.11	0.1	0.0	20.0	5	45.9	1.5	T	76.0	28.1	7	264	305	355	0.1
6-8	16.0*	169082	65	13	1.4	.09	0.3	0.1	21.2	3	39.1	0.4	T	72.0	28.1	3	256	295	337	0.1
7-12	8.9	169413	79	7	0.9	.15	0.2	0.0	20.4	3	35.4	0.0	T	72.0	28.8	2	260	298	337	0.1
8-8	7.7*	169587	75	16	1.4	.14	0.3	0.1	21.4	3	35.2	0.7	0.0	71.0	29.9	1	260	300	338	0.2
9-8	4.9*	169834	60	11	0.5	.13	0.3	0.0	21.2	2	40.3	0.6	0.0	72.0	31.3	1	264	308	348	0.2

* USGS average dally discharge

DROWNING FORK AT BUSHNELL

The Drowning Fork rises in the Galesburg Plain northeast of Macomb and flows southwesterly to its junction with the Spoon River. The gaging station is 1 mile northwest of Bushnell, and the elevation of the gage datum is 615.02 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 25.9 square miles.

The tabulation of water quality data is for the period from October 12, 1961, to August 11, 1966. Discharge and quality data are also summarized graphically.

No duration curve of average daily flow values is available for comparison with instantaneous flows.

Annual rainfall during the period of sample collection was from 12.09 inches above normal to 11.02 inches below normal, based on records for one station within the drainage basin. The average annual departure was —2.99 inches.

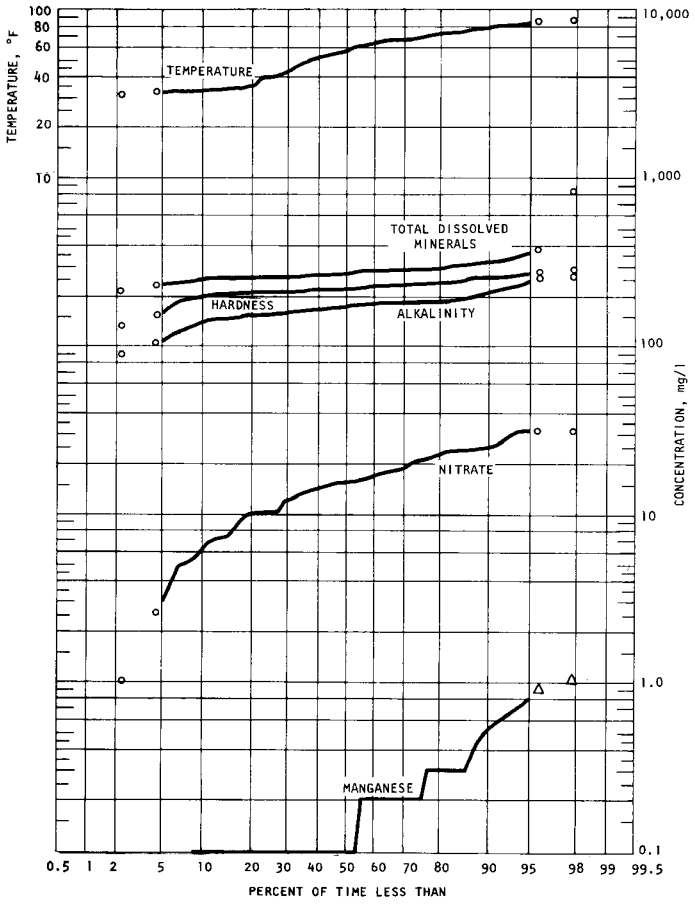
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow ranged from 1.4 cfs/sq mi to 0 cfs/sq mi, with a median flow of 0.37 cfs/sq mi.

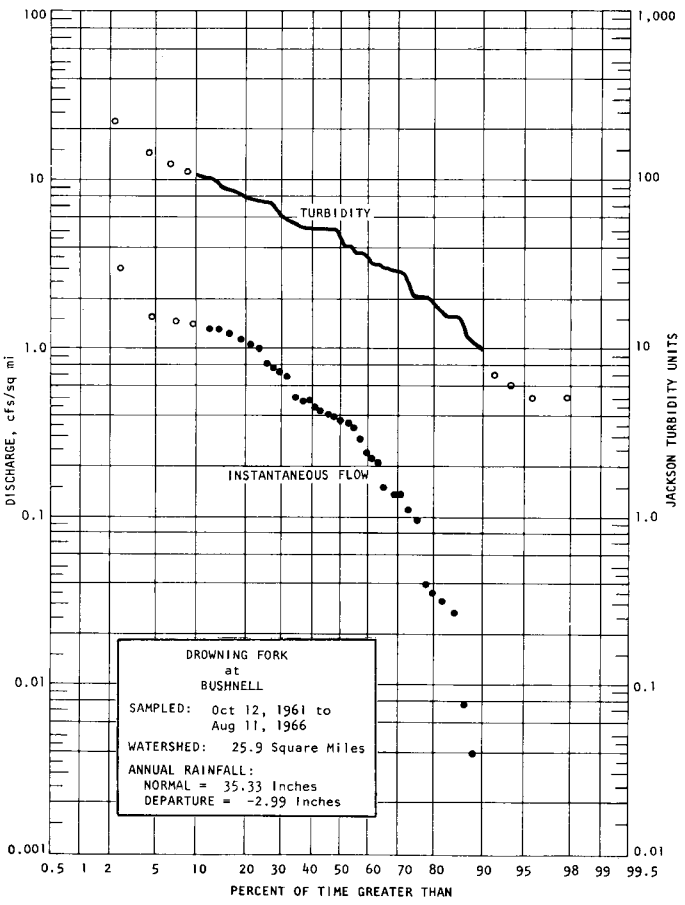
The turbidity was not less than 10 Jtu nor more than 110 Jtu for the central 80 percent of the time, with a median value of 45 Jtu.

Reported temperatures were over 80 F for 10 percent and over 70 F for 25 percent of the time. They were below 50 F for 35 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	135	175	210
Hardness (as $CaCO_3$)	200	225	255
Total dissolved minerals	250	270	320
Nitrate	6.2	15	25
Manganese	0.1	0.1	0.5





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
10-12	27.8	156027	61.5	41	1.6	0.1	0.2	0.0	13.8	5	43.4	15.4	T	54.8	25	6	188	240	294	0.3
11-14	25.6	156161	51	73	2.1	0.1	0.3	0.0	13.1	4	43.8	15.7	T	53.0	24.0	8	184	231	284	0.2
12-18	18.8	156335	40	41	1.1	0.1	0.2	0.0	11.1	5	44.4	16.7	T	52.9	24.2	7	180	232	287	0.1
1962																				
1-24	13.3	156585	33	64	2.5	0.1	0.2	0.1	7.4	5	42.6	16.5	T	53.0	23.0	5	172	227	252	0.1
2-7	33.9	156810	33	101	3.3	0.1	0.2	0.1	11.2	4	42.6	16.7	T	48.5	22.0	7	164	212	269	0.1
3-15	34.7	157060	34	75	2.1	0.1	0.2	0.1	10.1	6	38.5	18.2	T	47.5	20.7	5	152	204	245	0.4
4-11	21.0	157323	48.5	16	0.9	T	0.2	0.1	8.6	5	42.4	17.7	T	51.2	25.0	5	176	231	284	0.1
5-9	40.6	157523	52	87	3.1	0.2	0.2	0.0	12.0	4	42.3	20.8	T	51.0	22.7	2	160	221	257	0.3
6-13	29.1	157822	61	75	2.7	0.1	0.2	0.0	12.9	5	37.2	23.2	T	54.2	24.7	1	176	240	267	0.1
7-19	5.0*	158220	74	113	5.2	0.3	0.2	0.0	11.5	6	40.7	14.2	T	54.8	23.6	9	192	234	287	0.3
8-17	0.2	158428	74	105	4.2	0.7	0.3	0.2	8.5	31	74.5	2.6	T	59.1	27.7	37	220	262	383	0.2
9-20	0.0	158680	59	36	2.0	1.0	0.4	0.1	16.1	20	26.1	4.9	0.1	64.6	23.0	27	256	256	343	0.5
10-16	0.0	158850	63	52	1.6	0.3	0.3	0.1	8.8	9	45.5	5.4	0.1	52.1	22.0	32	188	221	288	0.8
11-21	1.0	159088	49.5	90	1.9	0.2	0.3	0.1	8.0	7	55.3	7.3	0.1	58.6	26.6	6	196	256	308	0.4
12	No sample taken, no flow																			
1963																				
1	No sample taken, no flow																			
2-27	0.6*	159640	32	5	0.4	0.2	0.1	0.0	9.8	6	46.9	13.5	0.1	54.2	22.0	10	180	226	311	0.5
3-20	10.1	159797	42	51	1.6	0.1	0.3	0.0	9.4	7	49.0	18.3	T	51.4	24.2	7	168	228	281	0.3
4-17	3.7	159979	64	32	1.4	0.2	0.3	0.1	1.9	6	42.0	10.1	0.1	52.0	22.4	12	188	222	264	0.2
5-7	2.8	160213	78	20	0.8	0.0	0.2	0.1	5.7	4	45.0	1.0	7.2	58.5	27.4	12	252	259	324	4.4
6-13	0.8	160445	86.5	20	0.9	.26	0.4	0.1	6.9	12	43.6	9.3	0.1	58.0	31.1	12	228	273	326	1.1
7-16	0.1	160699	88	56	3.0	.31	0.3	0.1	11.2	13	45.5	10.0	0.1	48.2	18.4	13	152	196	277	1.5
8-20	0.0	161089	71	228	11	.52	0.2	0.2	6.3	21	51.6	7.6	T	38.0	10.0	25	102	136	220	0.5
9	No sample taken, no flow																			
10-9	0.0	161421	66	129	6.2	.89	0.5	0.4	8.0	160	239.8	10.5	0.1	93.6	37.0	127	188	386	805	0.7
11-5	No sample taken, no flow																			
12-10	No sample taken, no flow																			
1964																				
1-9	No sample taken, no flow																			
2-11	No sample taken, no flow																			
3-10	8.9	162475	41	12	0.7	.05	0.2	0.1	9.8	10	54.1	26.7	0.1	45.4	17.8	13	124	187	264	0.9
4-2	11.1	162643	53.5	5	0.1	.05	0.2	0.1	5.5	8	50.6	24.9	T	48.7	20.7	13	152	207	270	0.3
5-13	17.9	162981	55	30	2.1	.05	0.3	0.0	8.2	7	45.5	31.5	0.0	47.8	22.0	2	132	210	276	0.1
6-9	6.3	163161	79	51	2.0	.11	0.4	0.0	11.8	8	42.4	24.0	0.1	51.1	22.9	4	156	222	250	0.5
7	No sample taken, no flow																			
8-6	0.7	164706	83.5	51	2.5	.38	0.5	0.0	9.1	11	44.4	6.8	T	57.1	22.3	19	208	234	291	0.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9		No sample taken, no flow																		
10-15		No sample taken, no flow																		
11-13		No sample taken, no flow																		
12-22		No sample taken, no flow																		
1965																				
1-20	4.0	165117	32.5	6	0.4	.00	0.3	0.1	10.7	9	50.0	19.5	0.1	47.1	21.8	8	144	207	257	0.2
2-18	9.7	165337	40	7	0.4	.05	0.3	0.0	8.0	9	55.3	15.8	T	52.1	19.9	9	148	212	264	0.3
3-27	24.0*	165577	33	37	1.6	.07	0.2	0.0	8.9	11	48.5	24.2	0.1	47.6	20.4	11	142	203	259	0.2
4-29	38.6	165896	57	51	2.8	.11	0.2	0.1	9.2	11	45.5	31.4	0.0	48.0	21.9	12	148	210	266	0.3
5-19	10.4	166004	70	29	1.7	.22	0.3	0.1	7.3	10	45.9	22.4	T	49.6	22.1	11	160	215	260	0.0
6-24	5.6	166543	67	81	3.8	.23	0.3	0.0	11.1	11	43.4	21.6	T	52.0	23.2	13	174	225	273	0.4
7-20	3.6	166767	68	37	2.4	.22	0.3	0.0	11.8	6	40.3	14.9	T	51.2	22.9	9	172	222	286	4.6
8-19		No sample taken, no flow																		
9-20	140.0	167263	68.5	50	3.6	.12	0.1	0.1	14.0	12	37.2	14.5	T	47.9	19.8	14	164	201	262	0.4
10-20	12.7	167412	82	16	1.0	.07	0.3	0.2	9.9	8	46.7	10.6	0.1	52.0	25.8	16	190	236	279	7.3
11-29	7.5	167728	33	18	0.6	.17	0.3	0.1	8.5	13	45.9	14.3	T	55.2	26.4	15	202	246	304	0.0
12-16	5.5	167948	35	28	1.0	·19	0.4	0.1	7.2	10	42.8	12.7	0.0	53.6	24.8	8	184	236	283	0.9
1966																				
1-19	19.9	168160	34	29	1.2	.13	0.1	0.1	11.1	13	44.4	18.9	T	51.9	26.4	11	184	238	293	0.2
2-23	9.3	168598	44	59	2.3	.13	0.1	0.0	10.3	15	44.2	24.0	T	49.9	23.5	14	166	221	288	0.4
3-14	36.5	168448	35	21	1.8	.12	0.1	0.0	10.6	13	44.2	15.2	T	51.0	22.0	12	168	218	273	0.0
4-11	11.7	168687	56	10	0.8	.14	0.3	0.0	6.2	14	42.0	14.0	T	50.0	22.6	12	168	218	262	0.1
5-27	32.8	169043	63	53	2.8	.12	0.3	0.0	12.1	12	42.4	30.3	T	55.0	23.7	10	172	235	294	0.3
6-23	12.8	169170	67	77	3.4	.15	0.3	0.1	13.9	8	41.1	21.0	T	55.0	24.9	4	176	240	294	0.4
7-22	0.9	169536	73	32	1.3	.28	0.3	0.1	4.4	8	38.5	10.6	0.1	48.0	24.3	11	184	220	260	0.5
8-11	2.5	169586	67	145	7.8	.57	0.3	0.0	11.2	10	58.6	12.8	T	37.0	15.4	9	92	158	235	1.8
9-7		No sample taken, no flow																		

*USGS average daily discharge

ELKHORN CREEK NEAR PENROSE

Elkhorn Creek rises in the Rock River Hills Region northwest of Polo and flows southward into the Rock River. The gaging station is 2 miles northwest of Penrose, and the elevation of the gage datum is 657.85 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 153 square miles.

The tabulation of water quality data is for the period from October 20, 1961, to September 12, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961 - 1966 were slightly higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 12.38 inches above normal to 9.7 inches below normal, based on records for one station within the drainage basin. The average annual departure was —2.16 inches.

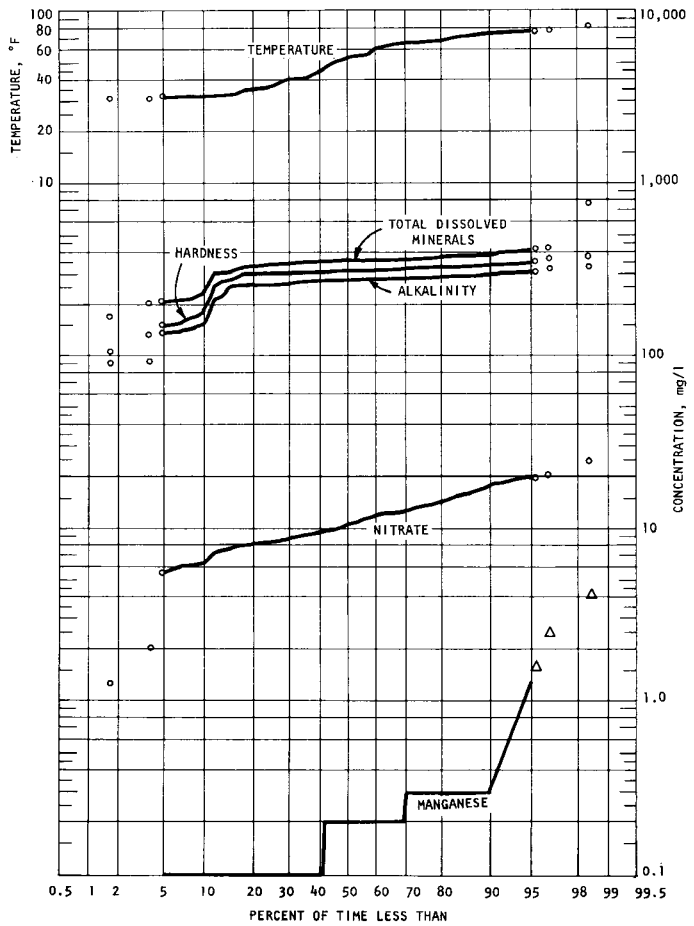
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.97 cfs/sq mi and was not less than 0.15 cfs/sq mi, with a median flow of 0.32 cfs/sq mi. The minimum average daily flow of record was 12 cfs in January 1959.

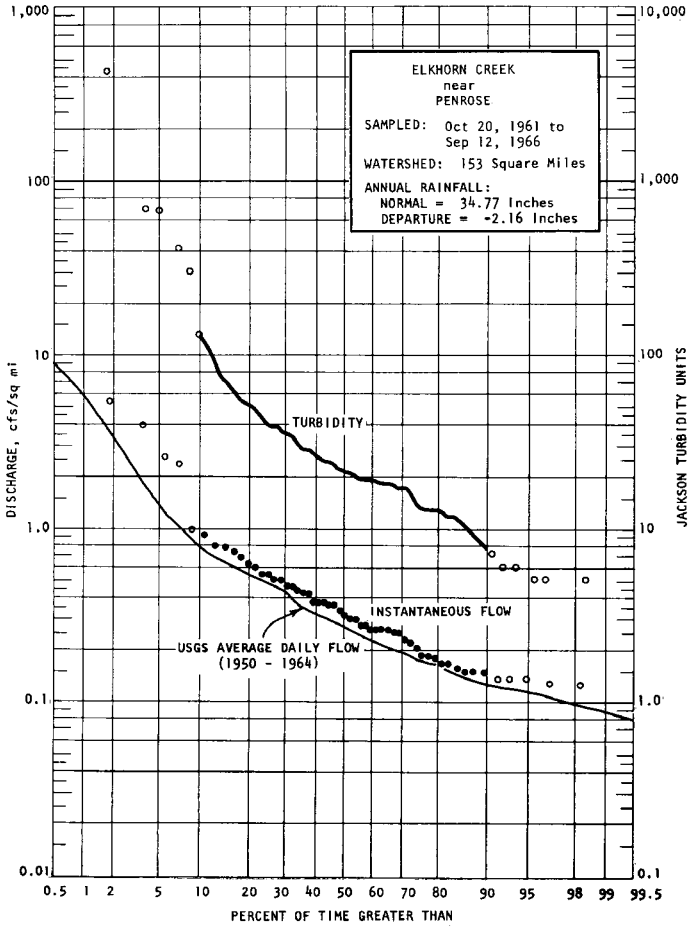
The turbidity was not less than 7 Jtu nor more than 130 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

'Reported temperatures were over 80 F for 2 percent and over 70 F for 20 percent of the time. They were below 50 F for 40 percent and below 40 F for 30 percent of the time.

The analyses indicated the following :

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90 %
Alkalinity (as $CaCO_3$)	150	280	300
Hardness (as $CaCO_3$)	180	320	340
Total dissolved minerals	230	360	390
Nitrate	6.4	10.8	18.4
Manganese	0.1	0.2	0.4





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
10-20	98.7	156030	46	20	1.2	0.1	0.1	0.1	9.3	6	60.7	11.0	T	73.0	33.9	13	268	322	358	0.6
11-17	617.0	156163	41	300	14	0.6	0.2	0.0	11.1	5	26.9	14.9	0.1	41.0	19.1	4	144	181	216	0.8
12-12		156325	33	18	0.8	0.1	0.2	0.1	14.4	7	41.8	13.9	0.0	77.0	37.8	4	292	348	386	0.4
1962																				
1-29	92.9	156582	39	5	0.3	0.1	0.2	0.0	10.5	9	36.0	13.5	0.1	70.6	33.9	6	268	316	347	0.3
2-20	106.0	156835	33.5	8	0.4	0.1	0.2	0.1	12.5	8	39.3	14.5	T	75.8	33.0	8	276	325	368	0.5
3-27	280.0*	157074	48	131	4.5	0.3	0.1	0.0	12.5	6	37.2	19.7	0.0	62.1	29.8	2	220	278	308	0.6
4-17	152.0	157311	54	24	1.1	0.1	0.1	0.1	9.6	7	43.2	12.4	T	69.4	35.1	12	279	318	350	0.3
5-15	156.0*	157552	71.5	76	4.7	0.3	0.0	0.1	15.0	7	44.2	18.4	T	68.7	35.4	6	260	317	359	0.5
6-12	83.4	157808	67	22	1.1	0.1	0.1	0.0	14.0	8	36.0	9.9	T	74.7	36.2	0	280	336	350	0.5
7-17	72.5	158218	68	39	2.3	0.1	0.1	0.0	16.0	7	35.6	6.4	0.1	74.7	35.8	3	288	334	365	0.5
8-20	56.8	158460	76	20	1.0	0.3	0.1	0.0	11.0	10	33.3	7.6	0.1	69.6	37.0	6	284	326	352	0.5
9-18	43.5	158650	57	33	1.3	0.2	0.2	0.1	13.6	7	31.5	8.9	0.1	57.0	36.1	5	252	291	331	0.6
10-16	41.3	158858	63	38	2.6	0.3	0.2	0.0	14.5	11	32.1	10.0	0.1	76.4	36.5	7	300	341	385	1.0
11-13	41.7	159027	42	17	0.6	0.1	0.1	0.1	12.0	8	34.8	12.7	0.1	76.4	36.7	5	296	342	359	0.7
12-11	43.3	159196	32	18	0.8	0.2	0.0	0.1	14.8	14	36.2	13.9	0.1	82.8	42.1	7	328	380	434	0.8
1963																				
1-15	28.6	159387	32	5	0.2	T	0.2	0.0	14.3	11	36.2	16.3	0.1	83.3	40.7	10	332	376	425	0.7
2-11	40.2	159544	34	21	1.1	0.2	0.1	0.1	14.0	9	32.7	15.8	0.1	71.3	35.4	5	276	324	375	1.4
3-12	113.0	159772	36	104	5.6	0.3	0.0	0.0	9.2	6	26.7	9.0	0.4	35.3	15.0	15	140	150	231	2.4
4-16	41.3	160027	60	12	0.5	0.3	0.1	0.0	4.0	8	31.1	8.2	0.3	65.7	34.4	13	284	306	349	0.5
5-16	38.1	160239	68	14	0.7	0.3	0.2	0.2	7.2	12	33.5	7.9	T	66.5	35.1	18	292	311	364	0.9
6-14	33.5	160405	78	19	4.6	.29	0.2	0.0	12.0	10	33.7	12.1	0.1	70.0	34.3	10	280	316	363	1.3
7-16	27.2	160738	82	51	2.1	.26	0.1	0.1	14.9	8	28.9	10.8	0.1	70.5	35.6	4	282	323	337	1.5
8-23	20.1	161044	75	25	1.2	.19	0.1	0.1	10.4	11	29.8	9.5	T	69.6	35.5	8	288	320	341	1.0
9-20	21.0	161268	65	26	1.1	.16	0.1	0.1	13.8	11	32.7	9.9	0.1	76.0	36.2	3	288	339	362	0.1
10-18	22.4	161469	63	60	1.2	.22	0.1	0.0	13.5	13	29.6	8.0	0.1	73.2	32.3	12	286	316	365	1.9
11-12	19.6	161619	41	19	0.5	.07	0.3	0.0	11.5	7	32.1	8.7	0.1	74.6	36.6	4	296	337	354	0.6
12-26	23.2	161905	35	7	0.3	.07	0.0	0.1	14.9	260	29.6	12.5	T	99.3	20.6	144	288	333	772	2.5
1964																				
1-14	20.7	162016	35	5	0.9	.12	0.1	0.0	13.4	9	33.7	13.0	0.1	80.0	40.0	4	316	364	406	0.4
2-10	24.7	162247	36	6	0.4	.14	0.1	0.2	10.8	10	30.9	11.6	T	72.5	36.7	5	288	333	362	1.3
3-13	409.0	162422	40	685	45	1.63	0.2	0.1	11.4	18	29.8	24.9	0.2	35.2	12.2	15	94	138	204	1.0
4-17	40.0*	162726	64	38	2.6	.31	0.2	0.1	11.2	10	38.9	6.3	0.1	74.1	31.4	11	280	315	349	1.0
5-14	68.2	162951	66	28	1.1	.17	0.1	0.0	8.8	9	37.6	13.9	0.0	69.3	32.0	4	252	305	356	1.1
6-29	57.6	163366	80	67	4.5	.28	0.2	0.0	15.0	11	42.0	18.4	0.1	74.9	34.4	2	260	329	347	0.7
7-16	37.6	163543	75	49	3.5	.22	0.2	0.0	11.8	10	35.4	11.6	T	74.4	36.5	4	284	336	355	0.9
8-12	25.3	163710	68	21	1.4	.16	0.0	0.0	7.5	11	35.8	8.0	T	69.8	34.5	18	296	316	361	0.8

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
9-15	22.4	164282	57	17	1.0	.18	0.3	0.1	10.1	13	31.7	8.7	T	72.2	37.2	14	304	333	390	0.1
10-16	22.0	164500	50	13	0.4	.19	0.1	0.1	6.4	14	32.9	7.4	T	72.6	35.3	15	300	326	373	1.0
11-17	26.6	164722	45	17	1.1	.14	0.2	0.0	6.6	9	31.1	9.2	T	69.5	34.2	14	292	314	360	1.0
12-11	35.0	164826	33	11	0.6	.11	0.1	0.1	12.9	11	33.9	5.6	T	70.8	33.7	9	280	315	351	1.2
1965																				
1-11	48.0	164996	33	13	0.9	.11	0.1	0.1	13.4	10	43.6	15.1	0.6	71.6	35.0	8	264	318	383	1.1
2-16	58.8	165197	33	28	1.0	.10	0.2	0.1	13.3	9	33.9	10.9	1.0	57.5	38.3	16	228	251	308	1.1
3-30	626.0*	165521	33	407	23	1.04	0.1	0.1	8.3	7	21.8	17.1	T	25.6	10.9	16	92	109	172	2.4
4-23	81.0*	165715	57	34	1.5	.40	0.2	0.1	11.5	12	41.6	12.4	T	72.0	35.8	12	282	327	374	0.6
5-11	120.0	165929	62	53	2.9	.17	0.2	0.0	13.1	11	44.0	19.5	T	70.4	34.0	12	264	316	378	0.6
6-15	45.4	166314	69	19	1.0	.19	0.1	0.1	11.1	11	38.9	9.1	T	72.8	38.4	14	306	340	383	0.7
7-15	29.2	166661	78	24	1.1	.26	0.2	0.1	14.3	15	34.8	8.1	0.0	78.0	31.7	16	296	325	387	0.9
8-5	31.0*	166849	72	29	1.2	.04	0.2	0.1	11.9	15	33.9	9.5	0.0	68.0	34.6	18	288	312	379	0.9
8-19	57.0	166999	68	43	2.5	.30	0.2	0.0	11.1	18	30.4	8.2	0.0	60.0	31.7	20	260	280	346	1.4
9-20	856.0	167223	68	661	27	2.47	0.1	0.1	10.6	6	20.8	6.1	0.0	36.2	15.7	13	148	155	218	1.3
10-11	76.1	167370	57	18	1.0	.08	0.1	0.1	12.1	12	40.7	10.4	T	74.2	35.3	12	288	330	383	0.6
11-8	51.3	167555	53	10	0.5	.17	0.1	0.1	7.4	11	38.7	8.2	T	71.8	35.5	12	288	325	381	0.5
12-6	57.5	167829	37	6	0.3	.10	0.2	0.1	9.0	13	40.3	12.4	0.0	75.2	34.8	15	292	330	386	0.5
1966																				
1-3	120.0	168030	37	18	1.5	.09	0.1	0.1	12.9	12	42.4	20.4	T	70.0	34.2	14	268	315	374	0.5
1-31	63.9	168201	33	12	0.5	.09	0.0	0.1	16.0	13	40.5	16.8	T	78.0	36.1	12	296	343	411	0.6
3-16	66.0	168523	42	19	0.5	.11	0.0	0.1	10.4	15	38.1	8.8	T	70.0	34.9	10	272	318	373	0.2
4-6	76.1	168665	43	13	0.2	.09	0.1	0.0	9.8	9	39.5	12.3	T	74.0	33.0	9	276	320	373	0.3
5-9	83.7	168863	51	9	0.4	.12	0.1	0.0	6.2	15	39.1	11.9	T	64.0	35.4	12	260	305	340	0.4
6-9	374.0	169084	53	4230	174	4.14	0.1	0.1	11.6	7	22.2	2.0	T	40.6	17.2	7	152	172	219	0.2
7-5	72.2	169213	74	35	1.8	.16	0.1	0.0	14.6	15	38.7	9.8	0.0	76.0	34.2	44	284	330	383	0.6
8-2	48.7	169540	68	24	1.0	.20	0.1	0.1	9.8	8	34.8	7.3	T	76.0	34.2	9	296	330	374	0 5
9-12	32.8	169852	72	13	0.3	.17	0.2	0.1	1.9	10	33.3	1.3	0.5	64.0	36.6	6	276	310	318	0.2

*USGS average daily discharge

EMBARRAS RIVER NEAR CAMARGO

The Embarras River rises south of Urbana in the Bloomington Ridged Plain—South and flows southerly to its junction with the Wabash River. The gaging station is 2 miles southwest of Camargo, and the elevation of the gage datum is 622.30 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 185 square miles.

The tabulation of water quality data is for the period from October 16, 1961, to September 20, 1966. Discharge and quality data are also summarized graphically.

No duration curve of average daily flows is available for comparison with instantaneous flows.

Annual rainfall during the period of sample collection was from 7.44 inches above normal to 10.11 inches below normal, based on records for two stations within the drainage basin. The average annual departure was —2.35 inches.

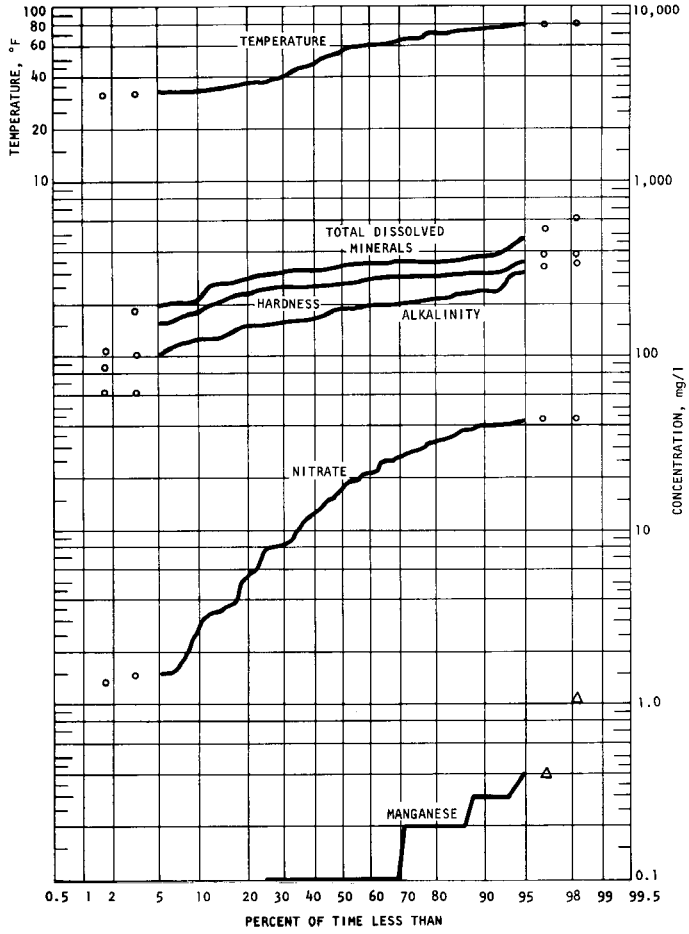
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.65 cfs/sq mi and was not less than 0.0076 cfs/sq mi, with a median flow of 0.2 cfs/sq mi.

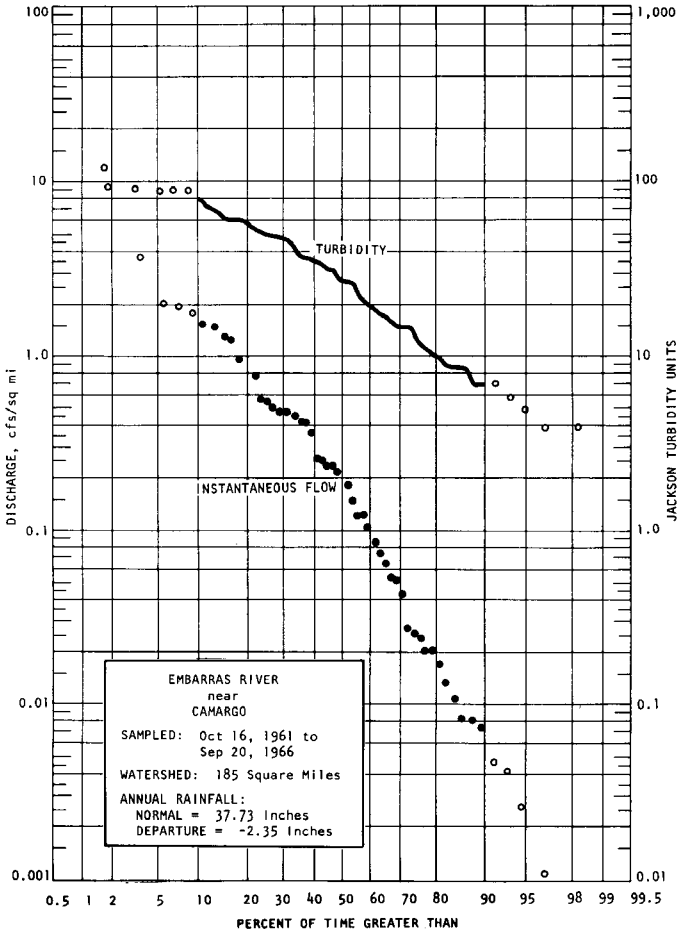
The turbidity was not less than 7 Jtu nor more than 80 Jtu for the central 80 percent of the time, with a median value of 30 Jtu.

Reported temperatures were over 80 F for 6 percent and over 70 F for 25 percent of the time. They were below 50 F for 42 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	130	195	240
Hardness (as $CaCO_3$)	190	275	315
Total dissolved minerals	225	340	390
Nitrate	3.2	17.7	41.0
Manganese	T	0.1	0.3





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-16	1.5	155847	57	56	2.3	0.3	0.2	0.2	5.0	21	54.5	3.5	T	56.2	24.7	16	188	242	309	0.4
11-16	28.2	156150	52	28	0.9	0.1	0.2	0.1	6.6	12	74.9	12.3	T	68.0	28.2	12	208	286	346	0.2
12-7	48.8	156274	38	9	0.6	0.0	0.3	0.1	8.2	9	68.4	17.1	T	68.0	28.2	7	204	286	348	0.0
1962																				
1-26	616.0*	156555	34	29	1.6	0.1	0.2	0.1	3.5	8	44.2	19.7	0.6	39.8	15.9	5	104	165	205	0.3
2-15	241.0	156774	40	24	1.0	0.0	0.2	0.1	6.4	7	50.4	25.1	T	51.2	20.7	1	132	213	264	0.3
3-15	347.0	157027	38	28	0.7	T	0.2	0.1	6.7	7	57.2	29.7	T	57.0	22.3	2	144	234	288	0.2
4-19	106.0	157284	54.5	18	0.5	0.1	0.2	0.0	4.1	9	65.2	30.4	T	63.0	24.4	7	168	258	318	0.1
5-4	368.0	157459	62	15	0.8	0.1	0.2	0.1	7.2	9	59.7	38.3	0.1	60.1	24.3	6	162	251	322	0.1
6-14	284.0	157796	66.0	71	2.8	T	0.1	0.1	9.6	7	58.0	41.7	T	67.7	25.9	4	180	276	322	0.2
7-17	1800.0	158175	76	93	3.2	0.1	0.1	0.1	9.2	2	18.7	8.2	0.1	23.7	7.1	2	64	88	113	0.3
8-13	36.0	158373	74	39	1.5	0.3	0.1	0.1	7.1	7	59.0	7.3	0.1	75.2	29.9	5	240	311	366	0.0
9-13	12.4	158547	76	51	1.9	T	0.1	0.1	10.0	7	54.7	8.9	0.1	67.1	27.7	2	212	282	342	0.3
10-4	5.3	158771	60	80	1.9	0.2	0.2	0.1	4.9	16	64.6	5.2	T	64.8	28.2	14	216	278	345	0.8
11-8	3.9	158981	45	13	1.0	0.1	0.1	0.2	4.1	14	63.1	6.0	0.1	69.4	27.4	14	228	286	351	1.3
12-6	4.7	159116	34	16	0.7	0.1	0.2	0.1	1.6	17	63.4	5.9	0.1	66.8	31.4	10	224	296	348	1.1
1963																				
1-10	4.8	159316	37	5	0.2	0.1	0.2	0.1	1.5	18	70.8	10.2	T	69.1	31.4	22	244	302	380	2.1
2-7	2.5	159467	33	11	0.5	0.1	0.2	0.4	5.6	39	82.1	18.3	0.1	90.4	40.9	44	336	394	555	3.9
3-11	310.0*	159729	41.5	17	0.8	0.1	0.2	0.0	8.2	7	48.8	33.4	T	51.1	17.8	7	128	201	263	0.3
4-5	255.0	159898	48.5	22	1.0	T	0.2	0.1	6.3	9	63.6	35.0	0.2	62.0	24.1	7	164	254	298	0.1
5-16	36.0	160210	64	39	1.8	0.2	0.1	0.1	5.8	10	56.0	22.4	0.0	66.5	26.9	6	200	277	319	0.5
6-13	45.3	160390	68	93	4.1	.17	0.2	0.2	8.0	7	48.8	27.3	0.1	57.8	22.3	8	172	236	291	0.4
7-18	9.7	160660	81	63	2.5	.16	0.2	0.2	10.4	8	50.6	14.3	0.1	67.6	27.7	1	210	283	312	0.7
8-9	3.8	160974	84	43	2.0	.28	0.3	0.1	7.4	8	57.8	3.8	0.1	61.3	24.9	13	208	256	328	0.7
9-12	1.6	161157	74	36	1.4	.17	0.3	0.4	5.5	16	59.9	2.1	0.1	70.7	29.2	13	240	297	340	0.6
10-24	0.0	161488	62	126	1.7	1.05	0.2	0.2	6.1	33	55.7	3.4	0.1	81.3	36.1	25	300	352	419	1.0
11-14	0.5	161622	47	63	1.7	.17	0.2	0.3	7.8	78	52.9	1.6	T	65.9	26.8	91	308	275	503	1.5
12-12	2.0	161821	35	7	0.6	.07	0.2	0.2	3.2	30	67.7	8.6	T	61.0	15.7	26	204	267	360	2.5
1964																				
1-9	1.4	161985	33	7	0.7	.16	0.2	0.3	5.2	75	95.7	3.2	1.4	89.0	41.7	85	352	394	629	5.9
2-13	23.3	162238	37	6	0.3	.11	0.2	0.1	5.7	11	66.9	15.1	T	62.7	26.5	3	176	266	314	0.8
3-4	90.3	162363	49	15	0.9	.07	0.2	0.0	5.3	11	57.6	19.8	T	59.0	24.2	6	168	247	294	0.2
4-14	184.0	162647	55	34	1.4	.15	0.2	0.1	4.8	14	64.0	36.6	T	62.1	24.7	10	164	257	311	0.2
5-14	84.6	162877	61	35	1.7	.40	0.2	0.1	6.6	12	60.5	22.9	T	66.7	24.6	3	168	268	329	0.3
6-11	19.9	163137	74	54	3.1	.13	0.2	0.0	7.9	14	60.7	21.4	T	66.8	26.5	7	192	276	340	0.8
7-10	14.1	163557	75.5	47	1.8	.13	0.1	0.1	7.7	12	59.9	10.0	T	60.4	27.0	8	196	262	309	0.5
8-19	No sample taken, no flow																			
9-17	0.2	164242	67	18	1.2	.05	0.3	0.0	2.3	13	30.6	3.7	T	30.0	27.5	15	168	188	213	0.3

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
10-15	0.8	164449	62	4	0.2	.04	0.3	0.1	0.8	23	29.2	1.6	0.1	24.8	28.9	7	132	181	216	0.2
11-12		No sample taken, no flow																		
12-10	3.5*	164872	34	7	0.1	.06	0.1	0.1	9.1	16	109.4	8.2	T	76.0	30.0	17	208	313	391	1.9
1965																				
1-5	94.5	164991	43	19	0.9	.05	0.2	0.1	4.9	15	78.2	25.8	0.1	62.3	23.0	7	140	250	340	0.3
2-4	49.6	165230	34.5	11	0.1	.00	0.1	0.2	5.6	14	78.2	39.0	T	68.2	27.2	7	164	282	363	0.2
3-18	142.0*	165424	40	32	1.7	.02	0.3	0.0	4.5	15	67.7	43.7	T	62.4	24.2	10	150	255	319	0.1
4-15	398.0	165670	48	49	2.1	.07	0.2	0.0	7.2	13	61.5	41.4	T	56.0	21.3	10	132	227	283	0.1
5-14	148.0	165921	60	63	4.1	.12	0.2	0.1	7.4	16	65.8	44.1	T	64.0	26.9	8	160	270	320	0.4
6-18	78.7	166284	68	32	1.6	.04	0.3	0.1	7.2	15	65.8	45.0	0.0	68.8	26.9	10	178	282	343	0.2
7-9	67.6	166551	75	60	2.6	.08	0.3	0.2	9.0	14	60.7	28.9	T	64.7	22.4	11	176	254	334	0.4
8-19	9.9	167020	78	48	2.0	.06	0.1	0.2	5.5	25	77.1	1.4	0.1	58.6	26.9	26	198	257	378	0.5
9-24	717.0	167231	62	39	1.4	.09	0.3	0.1	9.4	12	34.6	15.4	T	41.5	15.7	10	124	168	223	0.3
10-5	89.0	167344	55	10	1.0	.03	0.2	0.1	9.7	12	66.4	21.4	0.1	79.0	29.5	7	232	319	391	0.2
11-5	24.3	167561	53	21	1.7	.01	0.1	0.1	3.8	14	70.6	14.8	0.1	74.2	29.8	12	228	308	366	0.5
12-9	8.5	167788	38	4	0.2	.04	0.3	0.2	3.5	19	71.2	12.6	T	74.5	33.8	13	242	325	392	0.5
1966																				
1-11	110.0	168104	36	9	0.3	.07	0.2	0.1	8.4	12	64.6	26.8	T	73.2	30.5	5	214	308	348	0.3
2-18	90.6	168347	38	9	0.5	.04	0.1	0.1	9.3	17	62.3	28.0	T	69.8	30.6	9	208	300	362	0.4
3-7	306.0	168517	35	12	0.8	.05	0.3	0.0	8.3	12	64.2	32.7	0.0	70.0	28.1	18	196	290	342	0.2
4-19	44.3	168763	61	15	0.9	.16	0.1	0.1	3.3	20	67.1	19.5	T	68.0	28.8	12	200	288	339	0.4
5-24	181.0	169039	68	93	6.3	.26	0.3	0.1	8.2	13	62.3	41.0	0.0	74.0	29.3	7	204	305	364	0.2
6-13	41.0	169117	74	51	2.4	.13	0.5	0.1	8.6	14	65.8	32.7	0.1	74.0	30.5	6	208	310	370	0.3
7-11	16.4	169288	82	28	1.1	.11	0.2	0.1	9.8	13	63.2	13.4	T	71.0	32.4	44	212	310	364	0.7
8-2	0.9	169740	78	73	2.9	.41	0.3	0.1	3.8	22	72.6	1.5	0.0	60.0	29.3	15	196	270	353	0.5
9-20	78.2	169875	62	94	3.6	.22	0.1	0.1	6.4	17	44.4	8.3	0.7	28.0	8.5	15	64	105	191	2.3

*USGS average daily discharge

EMBARRAS RIVER AT STE. MARIE

The Embarras River rises south of Urbana in the Bloomington Ridged Plain — South and flows southerly to its junction with the Wabash River. The gaging station is in Ste. Marie, and the elevation of the gage datum is 446.75 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 1513 square miles.

The tabulation of water quality data is for the period from July 23, 1956, to September 21, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were very similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 14.21 inches above normal to 7.36 inches below normal, based on records for four stations within the drainage basin. The average annual departure was — 0.01 inch.

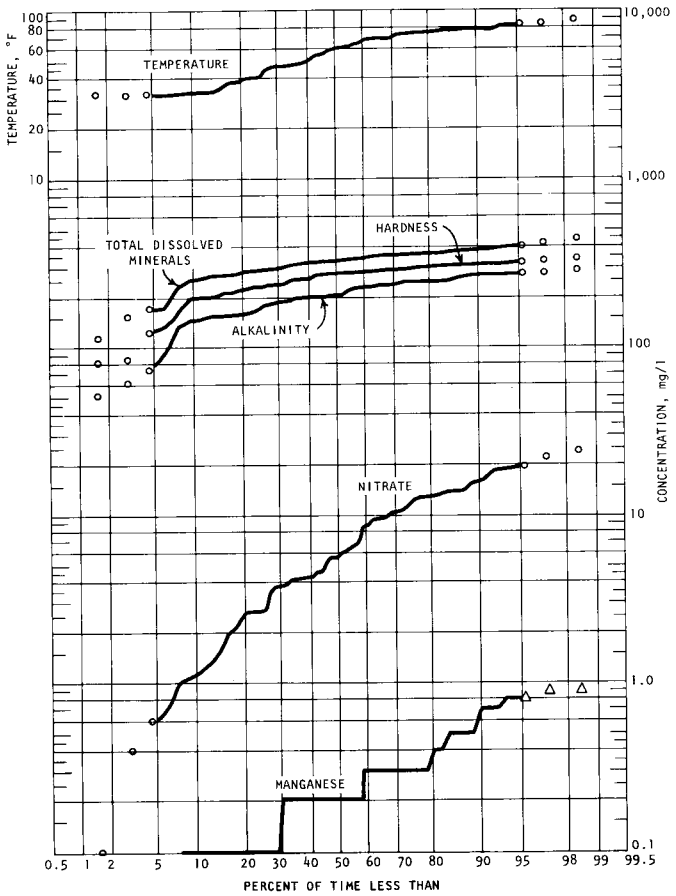
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.9 cfs/sq mi, and was not less than 0.022 cfs/sq mi, with a median flow of 0.22 cfs/sq mi. The minimum average daily flow of record was 1.4 cfs in September 1954.

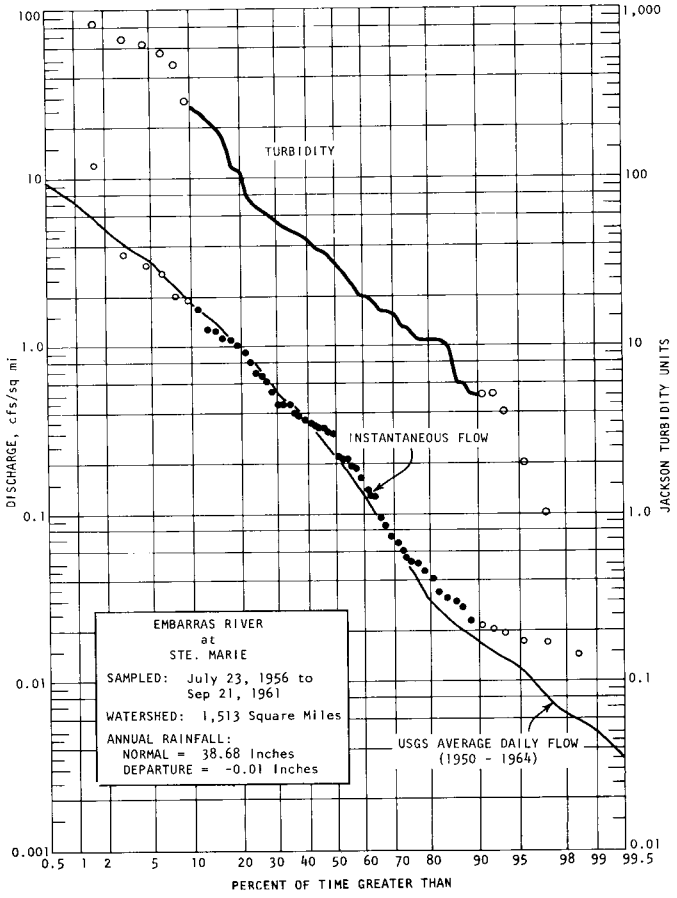
The turbidity was not less than 5 Jtu nor more than 280 Jtu for the central 80 percent of the time, with a median value of 35 Jtu.

Reported temperatures were over 80 F for 8 percent and over 70 F for 29 percent of the time. They were below 50 F for 40 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	150	210	270
Hardness (as $CaCO_3$)	200	280	310
Total dissolved minerals	250	330	390
Nitrate	1.1	5.7	16
Manganese	0.1	0.2	0.58





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-23	212.0	141081	76	51	2.4	0.3	0.2	0.0	9.8	15	41.3	5.0	0.1	70.8	29.3	8	248	298	332	
8-20	91.0	141298	73	22	2.3	0.9	0.1	0.2	4.5	19	42.8	1.9	T	66.2	27.3	14	236	278	320	
9-17	52.0	141492	74	12	1.2	0.8	0.1	0.1	4.4	15	37.4	0.6	0.1	62.8	25.0	22	248	260	318	
10-3	26.0	141591	64	13	1.3	0.7	0.2	0.2	4.8	18	39.3	0.1	0.1	73.7	29.2	17	276	305	353	
11-20	42.0	141926	48	T	0.3	0.2	0.1	0.0	7.3	20	44.2	0.4	T	74.1	30.6	22	284	312	377	
12-18	204.0	142146	39	24	1.0	0.1	0.3	0.1	8.3	25	60.1	13.2	0.2	57.4	22.9	13	156	238	300	
1957																				
1-14	110.0	142335	32	0	0.4	0.1	0.2	0.0	8.6	31	72.4	8.4	0.5	77.8	27.9	18	224	309	395	
2-14	1540.0	142627	40	240	3.6	0.2	0.2	0.1	8.3	13	60.4	13.9	0.1	56.4	22.2	2	144	233	274	
3-18	468.0	142885	50	19	1.1	0.1	0.2	0.0	5.8	21	72.8	18.5	T	69.5	26.4	14	192	283	385	
4-16	2560.0	143128	48	80	3.4	0.1	0.2	0.2	8.8	11	57.6	23.5	T	59.6	20.1	5	148	232	297	
5-13	810.0	143344	68	38	1.3	0.2	0.2	0.0	7.6	15	59.9	18.7	T	71.5	22.8	15	208	273	346	
6-17	19000.0	143630	83	480	7.2	0.1	0.2	0.2	7.7	5	17.9	6.1	T	24.2	5.4	0	50	83	113	
7-16	3100.0	143928	79	560	9.8	0.5	0.3	0.0	8.2	11	40.7	5.9	0.1	53.0	20.1	1	156	215	265	
8-12	318.0	144157	79	48	2.1	0.3	0.2	0.1	9.4	10	38.5	4.2	T	64.0	23.6	8	216	257	291	
9-16	200.0	144486	78	34	3.0	0.3	0.3	0.2	8.4	11	31.7	3.7	0.1	49.0	18.7	3	156	200	252	
10-16	76.0	144761	61	16	1.0	0.3	0.2	0.1	22.0	12	36.2	2.6	T	67.7	20.1	19	236	252	325	
11-21	1940.0	145061	44	200	8.0	T	0.2	0.1	14.4	12	51.0	10.5	T	57.0	21.5	2	160	231	271	
12-18	4260.0	145199	46	675	21	0.2	0.1	0.1	7.5	12	34.2	6.9	0.1	30.0	11.7	3	72	123	172	
1958																				
1-16	675.0	145490	38	11	0.6	T	0.1	T	10.6	16	58.6	16.2	T	74.0	31.1	9	236	313	369	
2-14	455.0	145731	32	6	0.5	0.1	0.2	0.1	9.4	17	63.6	12.8	T	79.0	33.2	7	248	334	389	
3-14	592.0	145983	40	18	1.3	0.1	0.2	0.1	6.6	23	74.3	4.5	T	67.0	29.6	12	202	289	357	
4-17	518.0	146331	58	16	1.4	0.1	0.2	0.1	5.9	18	61.7	5.5	T	72.7	30.0	7	226	306	364	
5-21	930.0	146679	68	290	6.9	0.3	0.1	0.1	9.2	15	62.0	9.4	0.2	63.1	24.8	0	204	286	329	
6-26	1700.0	146988	68	250	5.9	0.3	0.1	0.0	10.5	10	43.2	10.8	T	60.3	15.2	16	180	213	288	
7-24	2920.0	147277	69	185	2.7	0.3	0.1	0.1	12.0	11	40.7	0.7	T	63.0	23.3	1	196	254	289	
8-21	675.0	147509	75	64	4.2	0.2	0.1	0.1	12.0	12	42.6	9.2	T	73.0	28.9	9	248	301	361	
9-23	295.0	147761	68	46	1.3	0.2	0.2	0.1	9.7	14	36.4	4.2	T	56.0	23.4	12	200	236	289	
10-23	128.0	148007	56	4	0.7	0.2	0.1	0.0	8.9	17	42.0	3.7	T	71.8	29.8	12	258	302	337	
11-19	5500.0	148207	56	112	7.6	0.2	0.1	0.1	8.4	13	30.4	5.5	0.1	34.8	10.3	8	92	130	170	
12-12	600.0	148383	33	10	0.9	0.1	0.1	0.0	10.4	16	53.9	2.6	T	74.8	29.9	5	240	310	375	
1959																				
1-30	1760.0	148729	33	72	4.8	0.2	0.1	0.1	11.4	15	38.1	2.7	T	39.2	15.4	15	132	161	228	
2-21	1920.0	148937	32	68	5.2	0.2	0.2	0.0	9.2	12	51.0	3.8	T	59.8	22.0	8	184	240	299	
3-24	1400.0	149156	49	120	3.0	0.1	0.1	0.0	8.7	11	59.4	6.0	T	65.3	28.3	5	208	280	322	
4-18	555.0	149328	60	38	2.0	0.2	0.1	0.1	1.9	15	60.9	9.6	0.1	66.6	32.0	12	232	298	340	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
5-20	502.0	149641	68	58	3.3	0.3	0.1	0.1	8.9	21	57.6	15.2	0.1	66.7	26.0	12	200	275	347	
6-30	102.0	149951	88	26	2.0	0.8	0.2	0.1	7.1	17	41.6	2.1	T	61.5	32.0	12	242	285	326	
7-27	78.0	150144	79	49	3.0	0.7	0.2	0.0	6.5	20	30.0	2.6	T	49.7	19.3	21	188	203	258	
8-25	48.0	150425	82	36	2.1	0.5	0.1	0.0	3.4	23	31.9	1.2	T	59.9	21.0	18	208	236	294	
9-22	22.0	150671	73	13	0.6	0.5	0.3	0.2	14.3	15	34.8	2.5	T	69.2	28.9	16	268	292	354	
10-19	61.0	150824	59	20	1.4	0.3	0.1	0.0	5.9	22	33.7	4.2	0.1	45.8	20.3	18	168	198	270	
11-11	69.0	150980	46	41	3.0	0.2	0.1	0.0	6.4	60	35.8	4.5	T	48.5	19.1	41	164	200	329	
12-16	277.0	151239	40	30	2.4	0.2	0.2	0.0	7.5	42	68.9	9.5	T	55.6	20.7	30	152	224	329	
1960																				
1-6	320.0	151416	32	11	0.7	0.1	0.2	0.0	7.1	36	71.2	12.4	T	66.7	27.5	22	192	280	387	0.2
2-3	675.0	151608	35	50	1.1	T	0.2	0.0	5.7	25	70.3	11.4	T	61.7	25.7	15	176	260	323	0.2
3-16	335.0	151831	38	16	0.5	0.1	0.2	0.1	7.3	36	75.7	13.0	T	77.5	30.6	22	228	320	437	0.2
4-20	1020.0	152072	63	55	2.2	0.1	0.1	0.0	1.7	18	63.4	13.7	0.1	66.6	28.2	9	200	283	324	0.1
5-18	502.0	152262	69	37	4.4	0.2	0.2	0.0	5.7	26	66.2	12.7	0.0	68.3	27.7	18	208	285	358	0.2
6-22	1060.0	152524	79	840	19	0.5	0.2	0.1	8.7	14	43.4	19.1	T	58.0	19.7	6	160	226	292	0.5
7-29	244.0	152871	84.5	27	0.4	0.3	0.3	0.1	9.3	13	51.0	10.4	T	74.8	30.3	10	254	312	357	0.3
8-19	83.0	153028	76	15	1.5	0.3	0.1	0.1	7.2	13	43.0	1.1	T	66.9	30.1	10	248	291	330	0.2
9-16	36.0	153252	73.5	11	1.0	0.4	0.3	0.0	9.0	18	36.4	3.4	T	74.9	30.9	13	276	314	371	0.4
10-10	30.0	153372	65	6	0.7	0.3	0.2	0.1	5.9	14	36.2	1.5	T	71.1	25.9	19	268	285	344	0.3
11-18	32.0	153641	46.5	5	0.5	0.2	0.2	0.2	5.1	18	40.5	1.0	T	66.1	26.4	20	248	274	332	0.3
12-10	45.0	153760	33.5	1	0.2	0.0	0.1	0.1	3.2	23	45.1	1.3	T	65.9	26.8	25	248	275	340	0.3
1961																				
1-6	26.0	153937	32.5	5	0.4	0.3	0.1	0.1	2.1	34	57.2	4.1	0.1	74.0	31.6	29	268	315	410	0.7
2-10	31.0	154161	33	5	0.5	0.4	0.2	0.1	3.0	24	54.7	4.1	T	75.6	33.3	17	268	326	398	0.7
3-6	4800.0	154307	53.5	625	21	0.9	0.1	0.1	7.2	12	35.2	6.5	0.1	22.5	5.7	17	60	80	150	0.3
4-10	528.0	154569	49	20	0.9	0.1	0.2	0.1	7.4	30	81.3	13.8	T	69.1	28.7	20	196	291	381	0.2
5-23	1230.0	154866	60	64	3.0	0.2	0.2	0.1	8.6	14	60.5	21.8	0.1	69.0	25.9	9	200	279	362	0.2
7-14	144.0*	155293	78	11	T	0.2	0.2	0.1	6.8	14	52.0	8.5	0.2	71.4	29.3	6	232	299	347	2.0
8-18	202.0	155477	76	30	3.2	0.2	0.1	0.0	9.7	15	37.4	3.6	0.3	56.8	25.1	10	204	245	308	0.3
9-21	47.0	155688	67	9	0.7	0.4	0.2	0.1	6.4	14	42.2	2.8	T	76.2	28.3	14	272	307	341	0.3

*USGS average daily discharge

FLAT BRANCH NEAR TAYLORVILLE

The Flat Branch rises in the Springfield Plain Region northeast of Pana and flows generally northwesterly to its junction with the Sangamon River. The gaging station is 1.4 miles east of Taylorville, 1.8 miles upstream from the mouth, and the elevation of the gage datum is 562.44 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 279 square miles.

The tabulation of water quality data is for the period from October 18, 1961, to September 9, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 196l- 1966 were generally similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 5.11 inches above normal to 7.10 inches below normal, based on records for two stations within the drainage basin. The average annual departure was —0.81 inch.

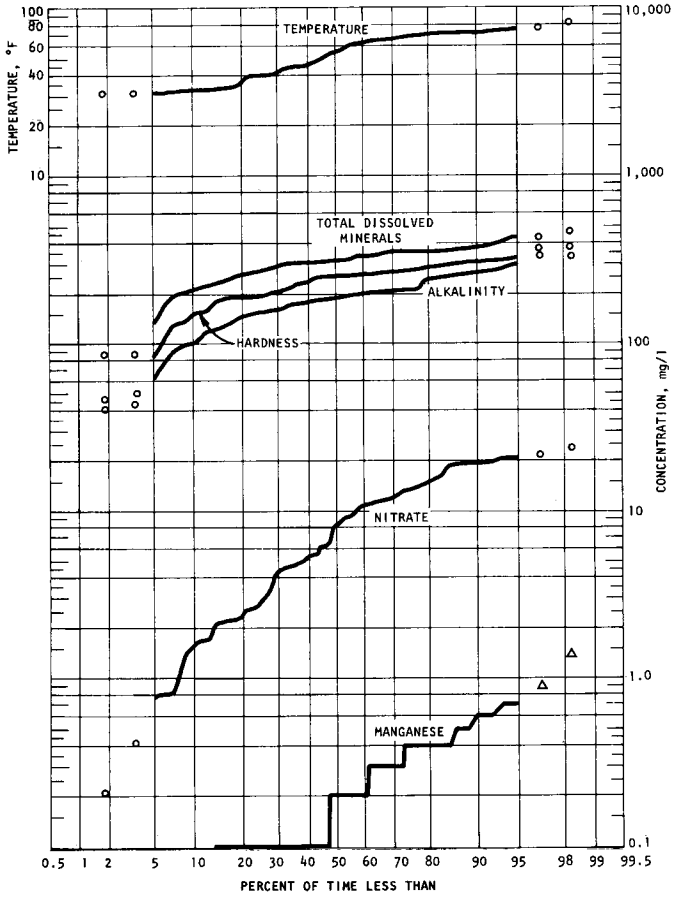
For 90 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.33 cfs/sq mi and was not less than 0.012 cfs/sq mi, with a median flow of 0.15 cfs/sq mi. The minimum average daily flow of record was 0 cfs in some months of 1953-1957 and 1964.

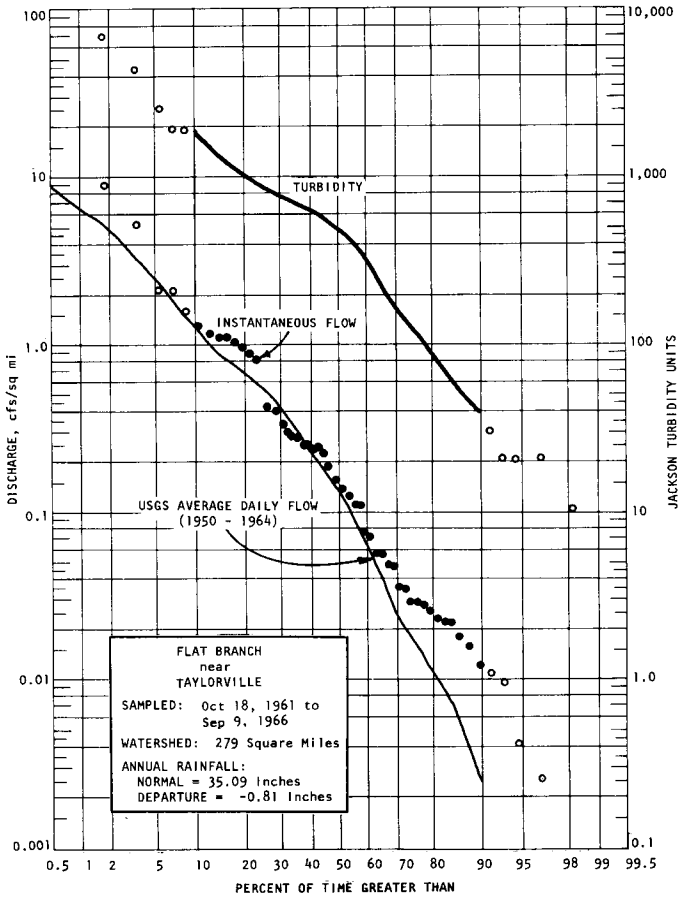
The turbidity was not less than 4 Jtu nor more than 190 Jtu for the central 80 percent of the time, with a median value of 50 Jtu.

Reported temperatures were over 80 F for 2 percent and over 70 F for 30 percent of the time. They were below 50 F for 45 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	100	190	270
Hardness (as $CaCO_3$)	155	255	305
Total dissolved minerals	215	320	390
Nitrate	1.7	8.4	19.3
Manganese	T	0.2	0.6





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-18	6.0	155923	57	38	1.2	0.3	0.2	0.1	8.0	16	49.8	2.3	T	61.3	24.2	16	212	253	305	0.6
11-14	81.0	156146	52	32	1.1	0.1	0.2	0.0	12.8	18	61.7	9.3	T	63.0	24.2	18	200	257	325	0.3
12-5	90.7	156272	47	46	2.0	0.1	0.2	0.1	10.4	19	59.9	11.1	0.1	61.6	27.0	15	200	265	330	0.4
1962																				
1-25		156557	33	3	0.1	0.0	0.3	0.0	8.1	18	51.0	15.4	0.1	60.0	26.3	8	184	258	316	0.2
2-14	318.0	156775	37	16	0.6	0.0	0.2	0.0	8.4	12	49.4	11.9	T	43.2	18.5	8	124	184	247	0.2
3-20	277.0	157028	46	20	0.3	0.0	0.2	0.1	7.2	14	62.9	16.3	T	55.5	23.6	10	160	236	299	0.3
4-17	83.0	157282	50	20	1.1	0.1	0.3	0.1	4.7	24	61.5	14.9	T	64.1	23.2	17	184	256	320	0.0
5-8	118.0	157462	67	51	2.0	0.2	0.2	0.1	9.0	20	60.7	11.7	0.1	61.7	26.6	14	194	263	333	0.5
6-5	36.6	157798	76	76	3.4	0.3	0.2	0.1	10.4	23	50.0	6.4	T	58.7	26.0	16	200	254	318	0.6
7-18	30.1	158177	73	89	3.6	0.6	0.1	0.1	12.3	20	44.0	5.5	0.1	56.5	21.6	18	192	230	311	0.3
8-15	13.4	158375	67	71	2.7	0.6	0.2	0.1	14.7	13	37.0	2.1	T	48.3	18.2	15	170	196	270	0.4
9-11	19.9	158544	67	114	3.9	0.4	0.1	0.1	10.3	8	28.6	2.6	0.1	39.0	14.5	11	136	157	205	0.4
10-9	9.3	158773	60.5	46	3.0	0.4	0.3	0.1	9.9	20	37.0	2.6	T	46.5	18.1	17	160	191	259	0.5
11-6	3.0	158978	41	9	0.4	0.2	0.1	0.2	12.4	27	42.0	1.7	0.1	71.4	28.6	25	268	296	391	0.6
12-4	8.1	159118	44	16	0.8	0.2	0.3	0.0	8.4	18	50.4	2.2	T	71.7	29.5	16	256	301	369	0.5
1963																				
1-8	6.8	159319	33	2	0.7	0.1	0.2	0.0	2.6	32	58.6	4.6	0.1	77.3	32.5	36	296	327	435	0.5
2-5	2.6	159466	34	13	0.4	0.5	0.3	0.0	9.1	21	65.4	6.5	0.1	88.1	38.6	26	332	379	472	0.3
3-11	367.0	159727	41	58	2.3	0.1	0.0	0.1	11.0	15	42.4	19.3	0.2	32.6	12.0	17	88	131	215	1.3
4-3	577.0	159896	62	17	0.7	0.0	0.1	0.0	11.4	14	52.3	18.8	0.2	47.3	17.9	12	128	192	272	0.3
5-14	44.2	160212	65	64	3.1	0.5	0.2	0.0	7.5	20	47.1	8.5	0.1	60.5	25.7	18	212	257	303	0.5
6-11	428.0	160389	72	133	4.4	.16	0.2	0.2	11.1	11	38.9	13.6	0.1	47.2	19.2	10	152	197	276	0.7
7-16	65.8	160662	75	125	3.5	.24	0.2	0.1	10.7	25	49.4	10.7	0.1	60.2	24.9	15	190	253	315	0.6
8-13	233.0	160976	73	260	8.5	.36	0.2	0.1	6.0	6	13.2	4.6	T	11.4	5.1	10	44	50	87	0.7
9-10	7.6	161158	70	55	2.3	.25	0.2	0.1	11.3	20	40.5	2.8	0.1	74.6	30.3	10	256	311	359	0.5
10-22	5.7	161487	64	186	2.1	1.38	0.2	0.1	10.3	16	30.0	1.7	0.1	72.0	28.0	16	276	295	334	1.1
11-12	1.1	161623	43	11	0.7	.27	0.3	0.1	8.9	18	31.7	0.4	0.1	70.9	29.3	17	280	298	354	0.8
12-10	4.3	161820	32	2	0.4	.09	0.3	0.1	7.3	18	49.6	1.4	T	66.1	27.8	21	248	280	340	2.5
1964																				
1-7	3.3	161984	33	5	0.3	.11	0.2	0.2	3.0	20	65.2	0.2	0.1	88.6	38.1	23	332	378	442	0.4
2-11	31.6	162236	33	2	0.1	.07	0.3	0.1	8.0	16	65.8	5.5	T	67.0	25.4	16	212	272	342	0.6
3-3	69.3	162364	45	4	0.2	.05	0.2	0.0	4.2	17	56.6	4.7	T	55.0	23.2	17	184	233	297	0.4
4-8	1420.0	162646	46	192	6.4	.12	0.2	0.1	11.9	14	47.9	18.8	T	35.2	11.4	21	96	135	221	0.6
5-11	59.9	162876	64	60	2.4	.26	0.3	0.1	6.0	19	60.1	14.2	0.1	62.7	26.8	14	204	267	350	0.4
6-9	39.8	163138	73	102	4.6	.28	0.2	0.1	11.3	20	49.6	12.6	0.1	61.0	25.2	33	188	256	314	0.6
7-16	9.9	163558	76	88	2.9	.13	0.3	0.0	10.1	17	43.8	6.3	T	53.1	20.8	24	196	218	297	0.5

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
8-19		No sample taken, no flow																		
9-16		No sample taken, no flow																		
10-14		No sample taken, no flow																		
11-11		No sample taken, no flow																		
12-15	4.9	164873	32	14	0.8	.05	0.2	0.1	5.9	14	71.4	4.9	T	52.1	20.2	22	160	213	301	1.3
1965																				
1-12	6.3	164989	34	7	0.4	.04	0.1	0.2	6.8	18	73.0	8.2	T	56.4	22.5	22	176	233	318	1.1
2-12	111.0	165231	40	43	1.9	.03	0.2	0.1	8.7	20	68.3	22.4	0.0	47.2	18.2	21	120	193	274	0.9
3-16	42.1	165421	45	11	0.6	.03	0.2	0.1	4.0	27	85.8	13.1	T	64.0	26.9	24	184	270	368	0.7
4-13	248.0	165668	58	68	3.0	.12	0.2	0.1	10.6	22	61.3	20.6	T	51.6	20.6	22	148	213	301	0.6
5-21	68.1	165987	70	81	4.3	.22	0.2	0.1	8.6	23	62.7	20.4	T	60.0	24.4	20	178	250	341	0.7
6-3	2460.0	166287	68	685	22	.65	0.1	0.1	7.0	6	15.6	9.4	0.1	12.8	3.4	12	40	46	89	0.7
7-8	325.0	166550	73	437	11	.39	0.3	0.0	7.2	11	26.7	19.6	0.1	22.2	9.8	15	68	95	146	0.4
8-13	8.1	167021	71	82	2.8	.73	0.3	0.1	10.2	23	46.1	0.8	0.1	48.2	19.1	21	164	199	199	0.6
9-14	15.3	167232	72	70	3.1	.41	0.3	0.0	12.0	27	57.8	5.3	T	62.4	26.3	25	212	264	360	2.3
10-7	65.1	167341	57	30	1.5	.12	0.3	0.1	10.0	23	58.2	11.6	T	64.8	26.8	18	206	272	352	0.9
11-10	20.7	167560	49	24	1.1	.21	0.2	0.2	7.1	29	57.6	3.1	T	71.2	30.6	23	248	304	401	1.7
12-8	15.4	167791	35	6	0.4	.06	0.2	0.1	4.3	26	58.8	3.9	0.0	72.0	31.1	21	252	308	377	1.4
1966																				
1-13	78.3	168103	33	5	0.1	.07	0.3	0.1	12.1	23	65.6	9.8	T	67.2	28.6	17	212	285	371	0.2
2-21	151.0	168349	34	1	0.4	.09	0.1	0.1	11.4	24	62.1	12.0	T	62.5	27.2	15	192	268	355	0.2
3-10	271.0	168518	41	60	2.8	.17	0.1	0.1	11.3	24	61.9	13.7	T	56.5	26.5	15	172	250	337	0.4
4-21	331.0	168765	55	78	2.9	.12	0.3	0.1	10.6	15	49.6	11.3	T	38.0	15.3	11	100	158	233	0.6
5-26	586.0	169042	66	193	7.7	.06	0.2	0.1	11.8	19	52.0	24.0	0.1	52.0	19.0	17	144	208	289	1.8
6-15	53.0	169118	71	143	8.8	.35	0.3	0.1	11.0	22	59.5	19.2	0.0	74.0	25.7	14	212	290	369	0.4
7-13	13.1	169287	83	67	2.3	.27	0.3	0.1	9.7	28	52.5	4.5	0.0	67.0	27.5	29	212	280	363	0.6
8-4	0.7	169738	77	37	1.6	.38	0.4	0.1	11.4	35	38.1	0.8	0.8	72.0	30.5	21	260	305	390	0.6
9-9	0.2	169835	64	113	6.1	.91	0.4	0.1	6.7	11	33.9	2.2	0.0	45.2	18.0	10	156	187	243	0.6

FOX RIVER AT ALGONQUIN

The Fox River rises in Wisconsin and flows through the Wheaton Morainal Region in a southerly direction to its junction with the Illinois River. The gaging station at Algonquin is 400 feet upstream from Crystal Creek, and the elevation of the gage datum is 729.48 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 1364 square miles.

The analysis of water quality data is for the period from July 19, 1956, to July 6, 1961; tabulations were made through October 5, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were generally similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 9.02 inches above normal to 7.74 inches below normal, based on records for two stations within the drainage basin. The average annual departure was +0.84 inch.

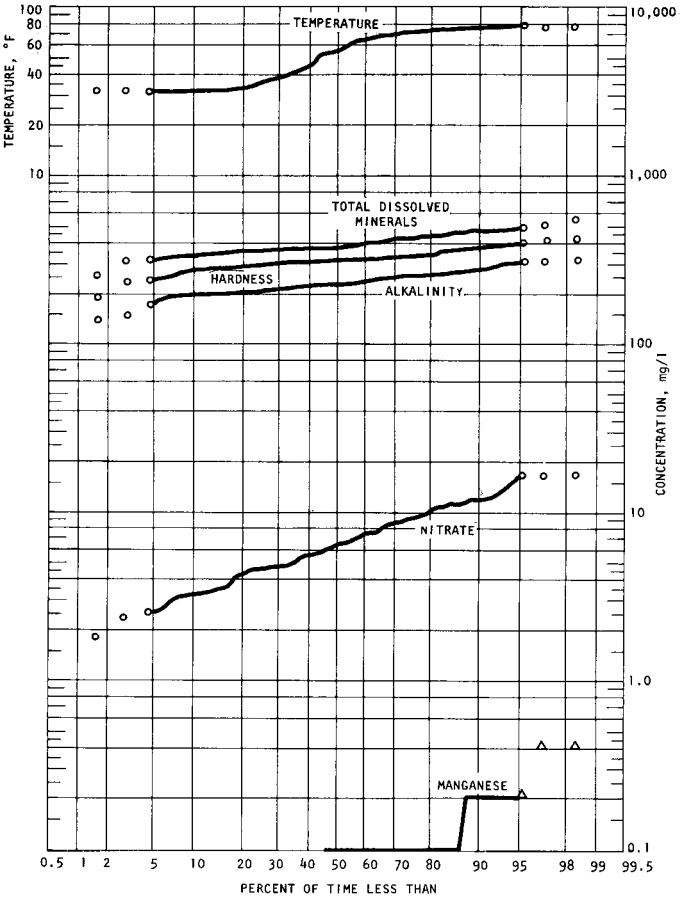
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.45 cfs/sq mi and was not less than 0.105 cfs/sq mi, with a median flow of 0.35 cfs/sq mi. The minimum average daily flow of record was 13 cfs in October 1956.

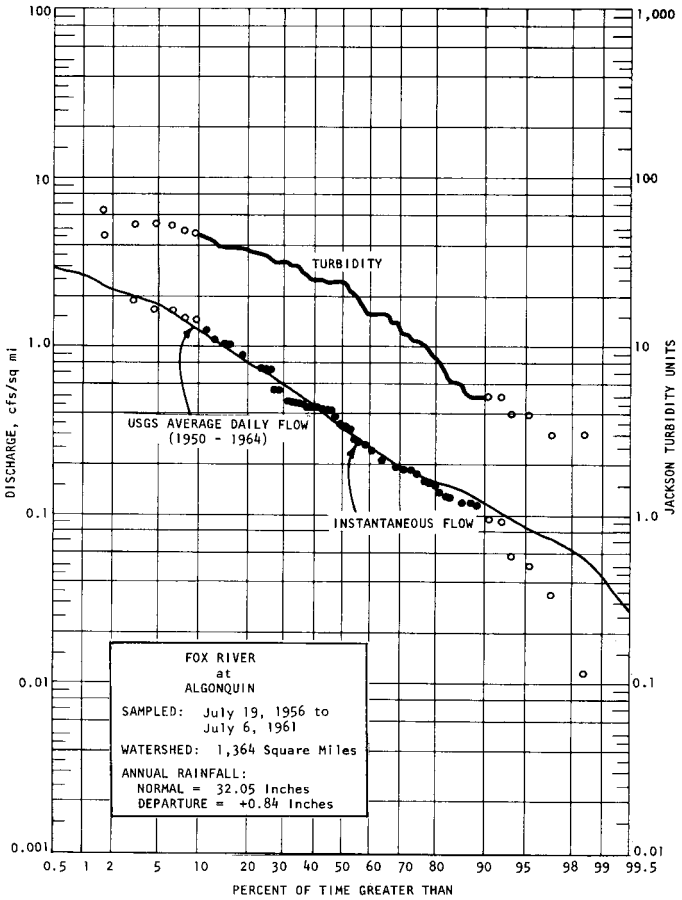
The turbidity was not less than 5 Jtu nor more than 45 Jtu for the central 80 percent of the time, with a median value of 25 Jtu.

Reported temperatures were never over 80 F and were over 70 F for 30 percent of the time. They were below 50 F for 42 percent and below 40 F for 32 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10 %	50%	90%
Alkalinity (as $CaCO_3$)	200	230	280
Hardness (as $CaCO_3$)	280	330	390
Total dissolved minerals	340	390	480
Nitrate	3.2	6.0	12.0
Manganese	0	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-19	240.0	141080	76.5	16	0.8	0.0	0.2	0.1	3.9	19	81.3	3.2	0.6	65.4	39.6	10	236	327	357	
8-16	280.0	141275	77.5	27	1.3	0.1	0.2	0.2	3.8	17	67.9	4.6	T	72. 1	34.3	1	224	321	348	
9-20	525.0	141518	63.5	14	0.3	0.1	0.2	0.1	1.3	17	57.6	1.8	0.5	54.1	36.7	8	220	287	333	
10-17	16.0	141714	62	9	0.8	0.1	0.2	0.6	3.4	25	78.6	9.4	0.1	53.8	40.3	28	236	300	405	
11-16	210.0	141927	41.5	4	1.2	0.4	0.2	0.0	3.1	27	79.8	11.3	0.1	64.7	41.5	34	276	333	453	
12-14	193.0	142109	35	11	1.5	0.2	0.2	0.0	3.9	19	72.8	2.4	0.8	66.8	43.4	15	280	346	405	
1957																				
1-25	260.0	142447	32.5	3	1.3	0.2	0.2	0.2	8.0	19	76.7	6.0	T	65.8	39.0	20	256	325	393	
2-22	609.0	142695	32.5	3	0.2	0.1	0.2	T	8.3	19	68.3	12.0	0.2	63.2	27.6	22	212	272	354	
3-22	454.0	142943	44.5	12	0.7	T	0.2	0.1	5.1	23	96.5	13.3	T	65.3	31.8	24	204	295	385	
4-26	585.0	143222	68.5	11	1.4	0.2	0.2	0.0	7.9	27	118.9	16.6	0.1	72.3	34.4	29	210	323	433	
5-24	1390.0	143447	68.5	21	2.0	T	0.1	0.2	8.3	25	114.6	17.0	T	74.4	34.7	26	216	329	435	
6-28	481.0	143724	73	39	0.7	0.1	0.2	0.1	7.6	14	90.3	3.6	T	62.5	35.7	10	208	303	366	
7-26	310.0	144023	75.5	24	0.7	0.1	0.1	0.1	11.3	16	87.0	2.7	0.1	59.5	35.5	13	208	295	380	
8-30	362.0	144316	73	39	2.3	0.1	0.3	0.3	31.3	25	92.6	10.6	0.1	64.4	38.1	30	243	318	443	
10-10	160.0	144715	57.5	24	0.7	0.0	0.3	0.2	2.2	17	78.2	4.6	0.1	54.6	40.1	9	212	302	360	
11-15	633.0	144999	44.5	22	2.7	0.0	0.2	0.1	8.3	24	89.5	7.3	T	69.5	41.7	13	240	346	438	
12-6	573.0	145196	36	12	0.4	0.0	0.3	0.1	8.8	21	90.1	5.2	0.2	72.0	40.5	15	252	347	446	
1958																				
1-17	375.0	145515	33	30	0.9	0.0	0.1	0.1	12.6	25	105.9	11.2	T	81.0	45.1	19	276	388	478	
2-14	260.0	145734	33	5	0.3	T	0.2	0.1	9.8	26	99.8	12.0	0.1	84.2	48.0	19	300	408	502	
3-14	994.0	145981	38	6	0.3	0.2	0.2	0.0	10.7	30	118.5	11.8	T	87.0	40.2	22	256	383	494	
4-12	658.0	146215	54.5	16	0.9	0.1	0.4	0.1	8.1	25	101.2	5.5	T	68.9	37.8	21	228	328	432	
5-16	168.0	146629	67.5	16	3.0	T	0.2	0.1	4.7	18	96.8	3.4	T	64.6	40.8	11	224	330	386	
6-20	352.0	146908	72	32	1.4	0.1	0.1	0.1	6.4	18	91.3	5.8	T	64.5	39.3	13	224	322	407	
7-18	126.0	147163	73	25	0.7	0.0	0.1	0.1	5.8	19	81.0	5.7	T	56.5	39.0	14	216	302	388	
8-14	68.0	147439	78	44	1.8	0.1	0.2	0.2	9.3	18	70.1	4.7	T	53.0	39.6	13	220	295	368	
9-12	47.0	147691	67	48	0.6	0.1	0.1	0.0	1.9	19	69.9	3.3	T	45.5	41.3	13	208	284	320	
10-10	81.0	147878	59	20	0.8	0.1	0.2	0.0	2.6	20	71.4	4.1	T	46.2	39.0	21	216	276	356	
11-14	134.0	148188	49	5	0.8	0.1	0.1	0.1	4.4	21	76.3	5.6	T	56.3	38.2	10	212	303	360	
12-12	260.0	148387	33	4	0.2	T	0.1	0.0	10.7	26	87.8	8.2	T	69.7	42.4	23	264	349	453	
1959																				
1-28	180.0	148710	32.5	8	0.5	0.1	0.3	0.1	12.0	38	102.0	4.7	T	88.6	49.6	25	316	425	548	
2-20	280.0	148898	32.5	10	0.4	0.1	0.3	0.1	12.3	37	82.3	3.3	0.1	80.2	42.2	25	288	374	480	
3-19	2000.0	149084	40	40	0.2	0.2	0.1	0.0	8.5	20	72.6	7.3	T	56.6	23.0	10	148	236	321	
4-24	621.0	149375	54	24	0.7	T	0.1	0.1	1.7	18	94.2	4.5	0.2	62.3	32.6	11	192	290	361	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
5-28	633.0	149734	79	25	1.3	0.0	0.3	0.1	4.3	14	84.7	3.5	T	66.2	35.6	10	224	312	364	
6-22	220.0	149929	75.5	53	1.3	0.4	0.3	0.1	5.6	18	72.8	2.5	1.9	51.8	36.6	15	214	280	365	
7-14	168.0	150032	79.5	50	2.4	T	0.3	0.1	14.0	20	72.2	7.0	0.1	44.3	34.3	22	192	252	362	
8-10	609.0	150344	80	54	1.8	T	0.3	0.1	14.6	16	68.9	5.8	T	44.7	32.1	13	174	244	319	
9-24	176.0	150644	70	66	0.7	0.1	0.3	0.1	13.8	22	68.7	4.9	T	49.6	34.0	19	198	264	353	
10-23	750.0	150819	52.5	32	0.6	0.0	0.2	0.0	4.2	15	101.0	7.6	0.1	72.2	36.1	9	216	329	394	
11-19	1050.0	151013	35	5	0.2	0.0	0.2	0.1	4.6	16	114.8	9.3	T	83.0	38.5	7	232	366	442	
12-16	1120.0	151238	37.5	6	0.2	T	0.2	0.1	6.6	16	115.0	6.4	T	82.8	40.6	10	248	374	434	
1960																				
1-12	2330.0	151412	33.5	18	1.0	T	0.2	0.0	5.9	16	88.5	10.6	T	70.3	32.8	7	204	311	366	0.1
2-18	1770.0	151696	33	28	0.2	0.0	0.2	0.0	7.3	15	89.7	8.6	T	77.6	37.6	8	244	349	423	0.2
3-23	750.0	151897	33.5	24	0.3	T	0.2	0.1	6.9	27	84.3	4.1	T	78.9	39.9	16	268	362	433	0.3
4-4	6340.0	151977	39	54	1.2	T	0.2	0.0	6.0	10	48.2	9.2	T	46.9	18.8	8	140	195	256	0.3
5-24	2660.0	152301	69	24	0.9	T	0.2	0.0	4.7	12	67.5	5.5	0.1	69.8	32.7	4	226	309	371	0.1
6-20	1020.0	152521	65	36	1.1	0.1	0.3	0.1	3.6	14	62.5	4.5	0.1	67.1	36.0	6	242	316	366	0.4
7-12	1430.0	152784	67.5	35	1.8	0.1	0.2	0.0	7.8	12	56.0	6.0	T	78.6	32.0	7	264	328	366	0.5
8-1	568.0	152943	71.5	34	1.6	0.1	0.4	0.1	12.5	10	51.6	8.0	T	65.0	34.4	5	240	304	354	0.5
9-9	291.0	153223	77.2	37	2.2	0.1	0.2	0.1	9.7	10	60.1	6.0	0.1	64.5	36.2	9	248	310	350	0.6
10-5	568.0	153375	63.5	32	0.8	0.1	0.2	0.1	9.3	11	58.6	5.0	0.1	65.1	34.4	9	244	305	340	0.5
11-10	1220.0	153599	55.2	5	0.4	0.0	0.3	0.1	6.6	14	68.3	3.1	0.1	68.3	36.7	9	248	322	389	0.1
12-8	980.0	153731	32.5	14	0.9	0.1	0.2	0.2	6.7	12	76.1	7.2	T	78.7	36.5	11	268	347	396	0.2
1961																				
1-6	333.0	153940	33	16	0.2	0.0	0.3	0.1	6.6	19	93.2	10.0	T	92.0	43.8	21	324	410	492	0.6
2-9	377.0	154159	33	7	0.5	0.0	0.2	0.1	4.8	28	78.9	16.4	0.1	82.0	44.5	23	304	388	476	1.1
3-13	1510.0	154334	37.2	25	0.8	0.1	0.2	0.0	4.8	14	63.4	6.7	T	65.3	30.3	11	220	288	340	0.2
4-6	1990.0	154526	44.2	16	0.4	0.0	0.2	0.0	3.9	11	73.0	6.4	0.1	68.6	31.3	7	220	300	340	0.2
5-2	2320.0	154752	55.2	42	1.6	0.1	0.2	0.0	2.1	11	74.7	4.7	0.1	74.8	33.6	7	244	325	365	0.2
6-8	475.0	154967	72	30	0.9	0.0	0.2	0.1	1.3	12	81.7	8.8	0.1	62.7	36.0	16	232	305	384	0.6
7-6	262.0	155232	71	39	1.0	0.1	0.2	0.1	5.6	25	68.5	8.7	0.1	66.5	38.1	20	252	323	395	1.0
8-1	281.0	155390	78	46	1.2	0.1	0.2	0.1	1.8	21	62.3	9.6	0.2	59.3	37.8	17	240	304	365	1.2
9-7	225.0	155609	78	36	0.8	T	0.2	0.1	12.9	21	56.6	8.2	0.1	61.4	36.4	14	240	303	365	1.2
10-5	1490 .0	155835	64	29	1.0	0.1	0.2	0.1	15.1	18	78.8	8.9	0.1	70.0	35.0	11	228	319	380	0.6

FOX RIVER AT DAYTON

The Fox River rises in Wisconsin and flows through the Wheaton Morainal Region in a southerly direction to its junction with the Illinois River. The gaging station at Dayton is 5.6 miles upstream from the river's mouth, and the elevation of the gage datum is 462.30 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 2570 square miles.

The tabulation of water quality data is for the period from July 24, 1956, to October 6, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were generally similar, except for low flows, to those indicated by the USGS average daily flow records during 1950- 1964. Annual rainfall during the period of sample collection was from 9.74 inches above normal to 14.12 inches below normal, based on records for four stations within the drainage basin. The average nnual departure was —0.98 inch.

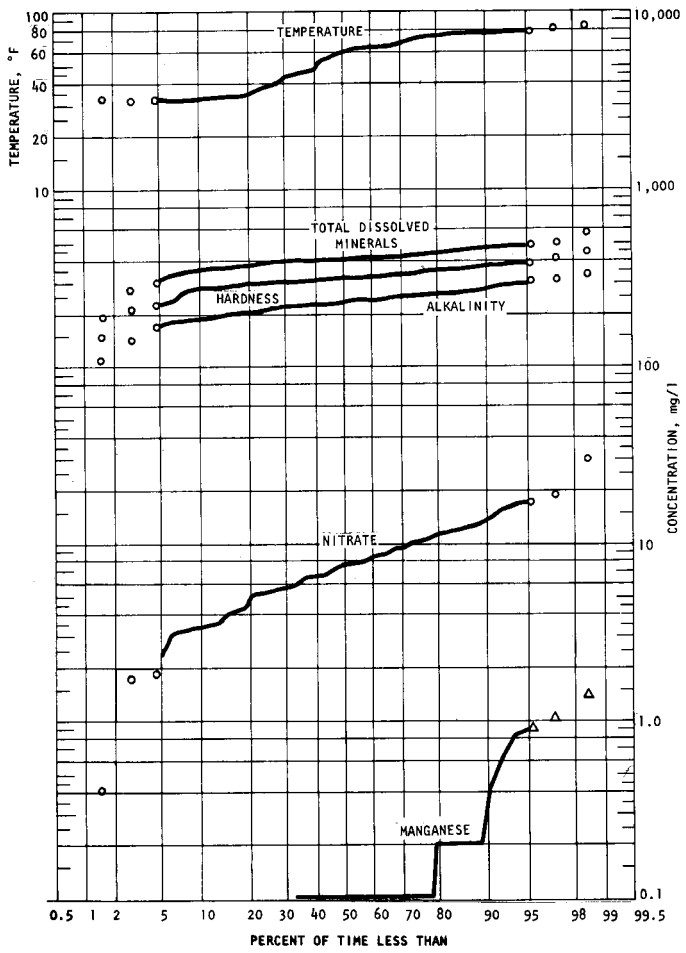
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.2 cfs/sq mi, and was not less than 0.028 cfs/sq mi, with a median flow of 0.412 cfs/sq mi. The minimum average daily flow of record was 44 cfs in October 1956.

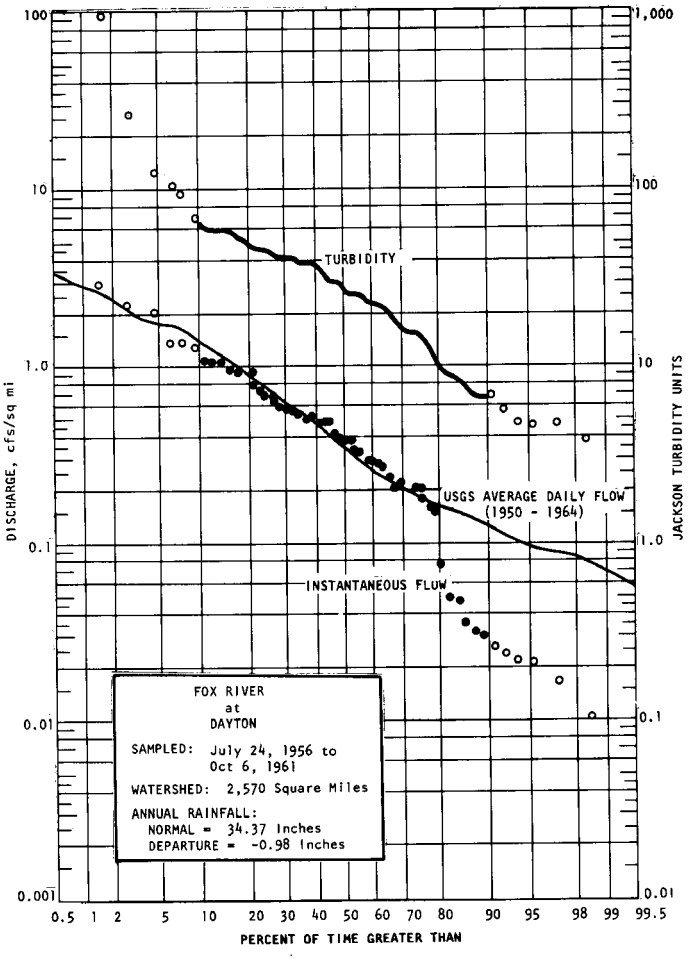
The turbidity was not less than 7 Jtu nor more than 70 Jtu for the central 80 percent of the time, with a median value of 30 Jtu.

Reported temperatures were over 80 F for 2 percent and over 70 F for 30 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	185	230	285
Hardness (as $CaCO_3$)	275	320	370
Total dissolved minerals	350	400	480
Nitrate	3.4	7.6	13.5
Manganese	0	0.1	0.35





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-24	548.0	141125	80	54	2.5	0.9	0.3	0.1	7.7	31	83.1	3.4	0.1	57.4	38.3	31	236	302	421	
8-23	554.0	141325	76.5	43	1.0	0.6	0.2	0.0	2.0	23	70.1	3.7	0.1	60.8	37.2	20	240	305	394	
9-25	54.0	141553	64	22	1.3	0.2	0.2	0.0	3.6	28	77.3	5.4	T	59.1	38.0	33	252	304	399	
10-18	44.0	141715	65	24	1.1	0.1	0.3	0.9	12.9	42	82.0	3.3	0.1	74.1	41.1	40	296	355	492	
11-6	68.0	141843	59	16	5.6	0.1	0.4	0.4	5.3	51	69.3	0.4	0.4	73.1	39.6	41	292	346	460	
12-18	566.0	142183	34	9	0.1	0.2	0.3	0.1	3.2	37	75.7	6.4	0.6	74.1	41.0	29	268	351	459	
1957																				
1-24	1600.0	142448	32.5	36	1.4	0.2	0.2	0.3	7.3	24	74.3	12.4	T	54.8	23.8	29	176	235	343	
2-14	1370.0	142716	33	16	0.7	T	0.2	0.2	8.1	21	83.5	8.9	T	65.8	26.9	19	192	275	365	
4-2	1370.0	143028	47	17	0.9	0.1	0.2	0.3	2.9	19	91.9	8.2	T	65.3	33.1	17	208	300	384	
4-25	3730.0	143254	64	1000	11	1.0	0.2	0.0	9.5	14	81.9	30.0	T	74.4	26.9	10	190	297	396	
5-28	2360.0	143514	65	62	2.9	0.1	0.2	0.1	3.6	15	112.7	17.4	T	83.0	32.9	13	218	343	422	
6-25	1320.0	143723	74.5	32	2.7	T	0.2	0.2	2.6	11	94.0	8.5	0.1	68.5	36.3	7	216	320	364	
7-16	1900.0	143948	78	63	2.7	T	0.3	0.2	6.3	14	86.2	8.3	0.1	67.5	31.0	1	184	297	357	
8-13	1080.0	144209	77	47	1.2	0.1	0.3	0.0	20.5	20	89.5	6.3	T	69.0	36.3	15	228	322	394	
9-10	1040.0	144448	68.5	43	1.7	0.1	0.3	0.2	4.5	26	83.7	5.5	T	75.8	38.9	9	236	349	408	
10-11	92.0	144839	56.5	6	0.9	0.0	0.4	0.1	3.6	34	86.6	4.0	0.1	68.2	40.8	16	232	338	411	
11-20	2020.0	145136	37.5	43	2.1	T	0.3	0.1	6.8	19	95.4	8.8	T	75.3	39.5	5	228	351	404	
12-10	602.0	145275	35	8	0.5	T	0.2	0.1	3.7	25	95.2	6.4	T	75.5	41.6	18	260	360	445	
1958																				
1-23	602.0	145576	32.5	8	0.3	T	0.3	0.1	2.8	18	102.6	7.1	T	77.5	42.5	13	260	369	450	
2-19	200.0	145803	31.5	5	0.2	0.0	0.1	0.1	4.2	38	112.7	6.0	0.1	98.1	50.2	29	340	452	581	
3-26	1320.0	146142	45.5	18	0.7	T	0.3	0.1	19.8	19	105.3	4.4	T	62.5	40.8	13	212	325	409	
4-22	883.0	146371	60	16	1.1	0.1	0.1	0.1	5.4	20	94.4	5.1	0.1	70.4	37.8	12	228	332	392	
5-26	125.0	146738	73	27	1.0	0.1	0.3	0.1	7.6	21	96.9	1.9	T	63.1	41.1	17	232	327	407	
6-17	2540.0	146919	66	105	4.9	0.2	0.1	0.1	13.6	13	80.4	13.0	T	76.2	31.8	2	212	321	393	
7-23	440.0	147279	75	39	1.6	0.2	0.1	0.1	6.9	19	88.7	5.8	T	60.7	40.0	14	224	317	396	
8-19	64.0	147504	76	46	4.5	0.2	0.2	0.1	5.9	24	74.1	5.3	T	55.5	34.1	36	204	279	356	
9-26	82.0	147813	74	97	2.5	0.1	0.3	0.1	4.4	48	85.2	5.5	T	64.8	32.8	46	236	297	435	
10-23	88.0	148021	61	35	1.6	0.1	0.2	0.1	4.0	38	76.5	7.9	T	66.9	40.2	29	256	333	428	
11-19	415.0	148233	45	27	1.6	0.2	0.3	0.1	5.8	34	82.9	3.2	T	62.9	39.9	28	246	322	413	
12-16	554.0	148534	32.5	7	0.3	0.1	0.2	0.1	9.4	37	88.7	1.8	T	75.5	45.5	30	296	376	482	
1959																				
1-15		Sample received broken (frozen)																		
2-23	5790.0	148965	32.5	134	14	0.4	0.1	0.1	6.6	11	32.7	3.4	T	39.0	11.8	6	108	146	192	
3-20	3380.0	149183	45	44	2.8	0.1	0.1	0.0	12.3	16	74.5	15.5	T	59.4	15.2	34	172	211	332	
4-15	2860.0	149338	54.5	38	9.6	1.4	0.1	0.0	2.0	9	92.4	11.1	T	65.7	30.3	19	212	289	370	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
5-14	1650.0	149620	62	24	1.1	0.1	0.1	0.0	1.5	20	94.6	5.8	T	68.8	34.0	12	208	312	384	
6-17	785.0	149935	75	46	1.7	0.8	0.2	0.1	2.5	27	88.6	6.4	T	60.6	37.6	23	220	306	371	
7-22	1020.0	150300	80	71	2.6	0.1	0.4	0.1	10.4	39	77.3	7.2	0.1	57.1	32.8	26	194	278	414	
8-12	1080.0	150378	78	56	1.9	0.1	0.3	0.1	14.1	26	80.0	5.1	T	56.1	33.4	20	198	278	379	
9-11	58.0	150588	70	67	3.7	0.1	0.4	0.1	10.5	35	79.6	7.7	0.1	54.8	40.4	23	216	303	405	
10-1	1020.0	150750	64	63	2.4	0.1	0.3	0.2	4.1	39	77.1	10.8	T	61.0	35.1	35	228	297	435	
11-18	1500.0	151010	32.5	12	0.6	0.0	0.2	0.1	6.4	21	123.6	11.9	0.1	86.8	41.6	13	248	388	470	
12-16	1850.0	151273	39	5	0.3	T	0.1	0.1	8.8	21	115.2	9.6	T	89.3	40.7	16	268	391	487	
1960																				
1-14	8000.0	151478	40	260	18	0.1	0.2	0.0	7.8	10	60.7	18.9	T	56.2	20.9	4	144	227	275	0.5
2-4	2900.0	151606	34	32	0.6	T	0.2	0.0	8.7	16	91.3	16.6	T	77.0	36.5	11	236	343	404	0.4
3-15	1400.0	151842	33	20	0.3	T	0.3	0.0	4.1	25	94.0	6.8	T	81.6	39.3	15	260	366	423	0.5
4-15	6520.0	152073	54	49	1.3	T	0.2	0.0	6.5	13	66.0	10.4	T	63.0	25.0	7	180	261	300	0.3
5-4	3730.0	152221	62	26	0.8	T	0.3	0.0	2.7	16	78.8	12.3	T	74.1	32.8	8	224	321	381	0.2
6-22	2120.0*	152568	69	14	2.5	0.1	0.2	0.1	3.2	18	77.8	13.5	T	76.5	36.6	7	240	342	388	0.9
7-1	1550.0	152726	72	10	1.4	0.1	0.4	0.1	3.2	13	76.9	7.4	0.1	74.1	38.2	8	256	342	383	0.8
8-9	1320.0	153020	79	40	2.0	0.1	0.3	0.3	10.3	18	64.0	10.1	T	72.1	32.1	10	248	325	392	1.1
9-7	638.0	153186	84.5	39	1.0	0.1	0.2	0.2	5.9	25	63.8	9.6	0.1	55.7	37.8	20	228	295	359	1.0
10-3	130.0	153462	63	24	1.1	0.1	0.2	0.2	13.5	21	65.8	11.9	T	69.5	36.2	22	264	323	414	1.3
11-4	26.0	153575	46.5	24	0.8	0.0	0.2	0.1	4.3	20	67.9	7.6	T	66.8	34.5	18	244	309	393	1.1
12-7	1420.0	153776	38	9	0.4	0.0	0.1	0.1	2.7	18	81.9	7.8	T	75.4	36.8	19	264	340	408	0.8
1961																				
1-9	810.0	154014	32.5	5	0.4	T	0.2	0.2	5.8	29	93.4	12.2	T	90.4	45.0	24	316	411	499	1.6
2-7	740.0	154179	32	4	0.2	0.0	0.3	0.2	4.2	33	83.3	11.5	T	87.0	43.2	27	312	395	480	1.8
3-7	1550.0	154303	42	30	1.6	0.1	0.2	0.1	1.1	23	72.4	6.4	0.1	62.7	32.8	20	224	292	375	0.9
4-5	2660.0	154528	47.5	31	1.6	0.1	0.2	0.0	1.3	15	77.5	7.6	0.1	70.5	32.2	10	224	309	355	0.5
5-2	2920.0	154754	55	41	1.7	0.1	0.2	0.1	1.5	18	85.0	9.4	0.1	79.7	36.8	10	252	351	425	0.4
6-1	869.0	154946	70	7	0.4	0.0	0.2	0.1	1.5	26	75.1	3.0	0.1	68.8	37.2	16	244	325	384	0.9
7-5	764.0	155234	72	28	1.0	0.1	0.4	0.1	2.1	34	69.9	4.2	0.1	64.0	38.9	24	248	320	398	1.2
8-3	715.0	155389	81	40	1.5	0.2	0.3	0.1	6.0	31	66.9	9.7	0.1	56.9	33.2	26	216	279	360	1.2
9-5	1160.0	155618	79	36	1.6	0.1	0.4	0.1	1.7	33	58.4	5.7	0.1	51.8	29.1	36	216	249	362	1.3
10-6	2300.0	155838	60	23	1.5	0.1	0.2	0.1	1.0	15	94.4	12.1	T	82.6	37.3	8	248	360	399	0.7

*USGS average daily discharge

HADLEY CREEK NEAR BARRY

Hadley Creek rises in the Lincoln Hills Region near Kingston and flows southwest to the Mississippi River. The gaging station is 1.8 miles northwest of Barry, and the elevation of the gage datum is 533.59 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 40.6 square miles.

The tabulation of water quality data is for the period from July 17, 1956, to September 19, 1961. Discharge and quality data are also summarized graphically.

No duration curve of average daily flows is available for comparison with instantaneous flows.

Annual rainfall during the period of sample collection was from 5.02 inches above normal to 14.91 inches below normal, based on records for one station within the drainage basin. The average annual departure was +2.67 inches.

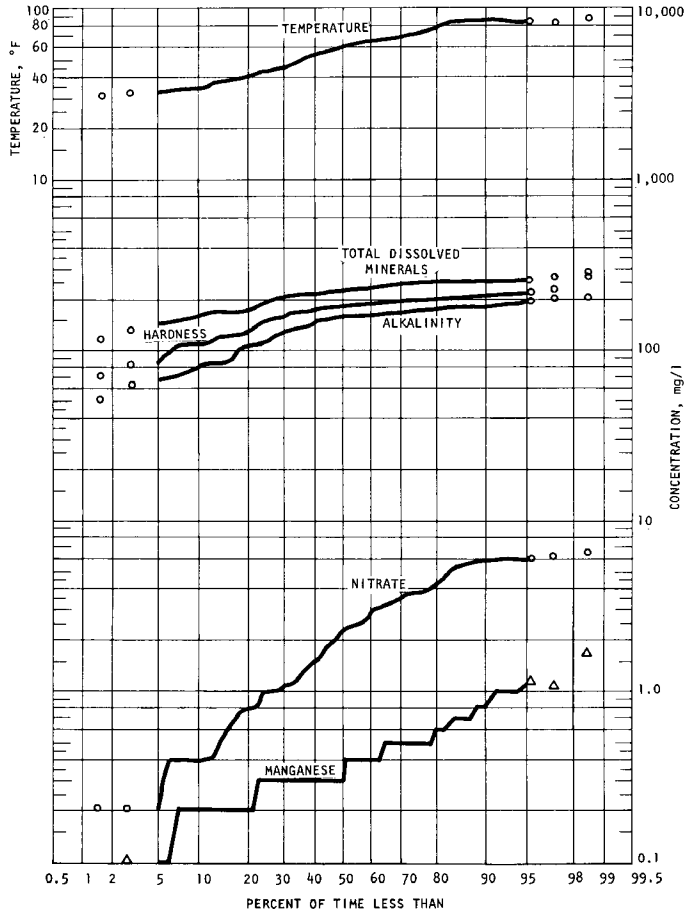
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.44 cfs/sq mi and was not less than 0.011 cfs/sq mi, with a median flow of 0.055 cfs/sq mi.

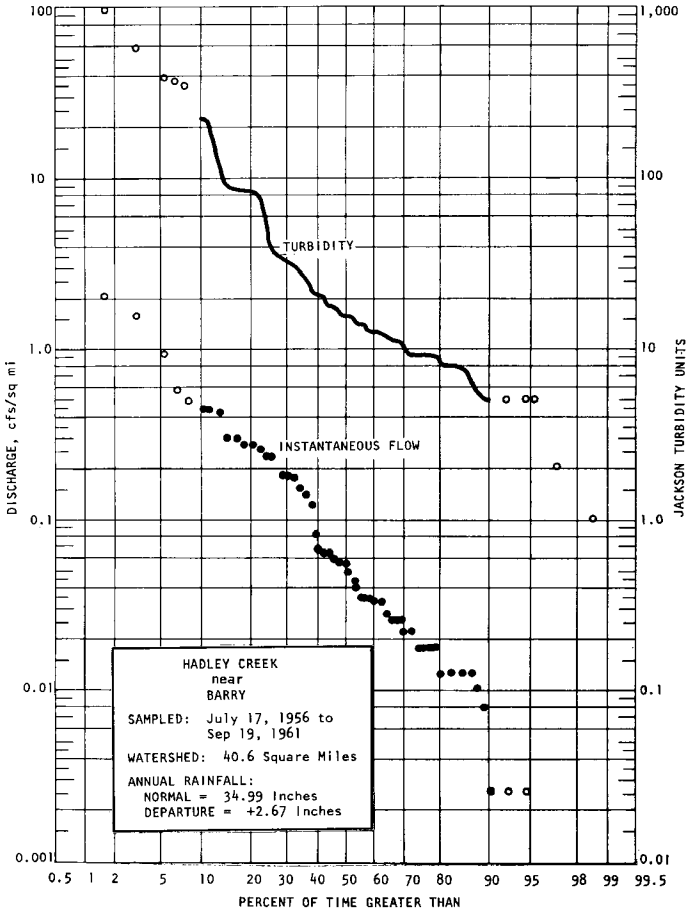
The turbidity was not less than 5 Jtu nor more than 230 Jtu for the central 80 percent of the time, with a median value of 15 Jtu.

Reported temperatures were over 80 F for 20 percent and over 70 F for 30 percent of the time. They were below 50 F for 30 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	80	165	185
Hardness (as $CaCO_3$)	110	180	210
Total dissolved minerals	165	230	265
Nitrate	0.4	2.2	6.0
Manganese	0.2	0.3	0.9





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-17	.5	141066	85	27	1.3	1.0	0.2	0.1	12.9	6	24.5	0.7	0.1	57.8	11.4	7	172	192	236	
8-14	.3	141269	91.5	95	4.9	1.1	0.2	0.1	8.8	8	25.3	3.1	T	38.5	6.9	2	88	125	149	
9-21		141516	61	13	0.1	1.7	0.2	0.4	3.9	15	20.4	0.2	0.1	61.2	10.2	16	188	295	247	
11-14		141956	53.5	15	0.8	0.7	0.1	0.0	6.1	11	23.0	0.4	0.1	66.3	12.1	11	200	216	262	
1957																				
1-23	11.0	142426	32	1000	12	0.7	0.1	0.1	7.0	6	28.8	3.4	0.1	22.4	3.6	10	52	71	119	
2-27	12.0	142762	44.5	380	6.0	0.2	0.1	T	11.6	6	45.9	6.0	0.1	27.1	3.8	19	64	84	165	
4-17	20.0	143221	54.5	5	0.5	0.1	0.2	0.1	8.3	7	64.6	5.8	0.1	53.4	8.7	9	108	170	231	
5-23	82.0	143446	62.5	137	6.0	0.4	0.2	0.1	13.4	6	41.6	6.0	T	33.7	6.2	8	70	110	173	
7-9	1.4	143955	85.5	9	2.5	0.3	0.1	0.2	23.5	6	40.0	0.5	T	63.0	11.1	6	170	203	251	
8-6	2.8	144132	82	220	3.0	0.5	0.3	0.0	11.0	4	22.4	1.7	T	42.5	7.8	2	112	139	181	
9-17		144526	67	9	0.7	0.2	0.2	0.0	10.9	8	309	1.0	T	72.3	6.8	11	188	209	249	
10-17	1.0	144773	65.5	8	0.7	0.4	0.3	0.1	26.0	6	29.6	0.2	T	65.7	10.6	5	180	208	275	
11-14	.7	145003	48	5	0.6	0.4	0.1	0.0	18.2	7	28.4	0.4	T	64.5	9.6	12	186	201	253	
12-16	.7	145313	40	6	0.6	0.3	0.1	0.0	10.8	8	29.2	0.4	T	65.0	10.4	10	184	206	228	
1958																				
1-14	1.0	145495	34.5	5	0.7	0.4	0.1	0.0	23.8	7	32.5	1.0	T	58.5	12.0	5	162	196	243	
2-26	7.4	145884	43	84	4.8	0.2	0.2	0.1	12.5	5	23.7	5.5	T	26.8	7.1	6	72	96	152	
3-25	5.6	146074	46	8	0.8	0.4	0.1	0.1	4.2	7	48.3	0.2	T	54.0	11.5	6	136	182	223	
4-25	17.0	146458	52	600	15	0.5	0.1	0.1	12.1	5	55.7	3.9	T	32.4	7.0	17	80	110	174	
5-22	3.2	146735	68	34	2.3	0.7	0.1	0.0	9.9	6	46.5	1.5	T	56.3	11.1	9	148	187	230	
6-19	2.4	146984	75	87	4.7	0.5	0.1	0.0	11.0	5	26.1	2.4	0.1	49.4	8.0	6	134	157	197	
7-28	7.4	147345	85	8	0.7	0.2	0.2	0.0	21.6	5	37.8	0.6	T	54.7	10.6	9	152	180	262	
8-27	9.3	147542	81	17	0.7	0.1	0.1	0.0	11.2	6	26.7	1.1	T	53.5	8.6	15	164	170	216	
9-26	.7	147776	69	32	0.8	0.5	0.2	0.0	11.4	5	24.5	1.1	T	61.0	10.4	6	176	196	239	
10-29	.7	148089	55	2	1.0	0.3	0.1	0.0	11.2	5	23.2	0.4	T	65.9	11.9	17	184	214	255	
11-20	7.9	148249	50	22	2.4	0.4	0.1	0.1	11.6	7	33.2	3.3	0.1	48.2	9.1	10	128	154	223	
12-11	1.7	148390	34.5	14	1.5	0.8	0.1	0.1	6.8	8	38.9	4.7	T	70.7	11.4	7	184	224	278	
1959																				
1-16	2.6	148690	32.5	18	1.3	0.5	0.1	0.1	8.6	7	46.1	0.8	T	60.7	11.2	6	152	198	246	
2-24	18.0	148935	42.5	46	4.3	0.4	0.3	0.1	12.6	8	37.4	2.1	0.1	35.0	7.2	9	84	117	169	
3-19	11.0	149086	55	5	0.6	0.1	0.1	0.0	8.2	6	48.3	2.2	T	50.7	8.3	9	120	161	208	
4-24	18.0	149377	57	10	0.6	0.3	0.1	0.0	9.6	8	49.0	4.0	T	48.7	7.8	14	120	154	220	
5-21	6.1	149678	71	21	1.4	0.4	0.1	0.0	13.8	10	46.3	0.4	T	54.7	9.1	15	144	174	228	
6-17	.9	149936	79	16	1.3	0.6	0.1	0.1	15.9	7	32.9	2.6	T	60.8	12.4	12	184	203	263	
7-23	.1	150139	87	13	0.8	0.8	0.2	0.0	13.4	6	19.7	0.8	T	61.7	9.1	16	190	192	236	
8-26	.1	150471	85	22	3.8	1.0	0.2	0.0	14.0	4	15.6	1.9	T	55.9	7.8	11	172	172	220	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SiO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
9-9	.1	150619	84	400	18	1.1	0.3	0.1	9.9	12	25.9	5.6	0.1	36.5	8.6	12	104	127	178	
10-21	1.1	150895	62	14	1.1	0.5	0.2	0.0	9.3	7	24.9	1.3	T	57.7	8.6	10	164	180	229	
11-13	.9	150998	39.5	11	1.7	0.3	0.2	0.0	8.7	7	25.5	1.0	T	64.4	9.5	10	184	200	239	
12-9	.5	151232	40	9	1.0	T	0.2	0.0	4.2	17	29.8	0.8	T	68.2	9.6	17	192	210	258	
1960																				
1-22	1.4	151505	32.5	35	1.0	0.6	0.1	0.0	11.1	6	45.7	3.5	T	68.1	11.1	9	176	216	271	0.0
2-24	2.3	151727	36	18	0.6	0.3	0.2	0.0	9.7	9	45.3	3.8	T	60.8	10.0	3	136	193	259	0.1
3-10	2.6	151818	34	12	0.7	0.3	0.2	0.0	6.8	9	45.5	2.5	T	63.4	11.3	12	168	205	252	0.0
4-13	10.0	152063	65	83	2.7	0.2	0.2	0.0	8.9	7	51.0	6.0	T	48.0	9.2	10	112	158	221	0.0
5-18	23.0	152260	63	86	4.4	0.3	0.2	0.0	11.5	6	38.5	4.2	0.1	38.1	7.2	7	88	125	173	0.1
6-9	7.1	152429	67	1	0.2	0.2	0.2	0.0	9.7	5	39.1	2.4	T	55.6	10.2	9	152	181	223	0.1
7-19	1.9	152831	83	16	1.0	0.5	0.2	0.1	13.8	4	30.6	2.4	T	58.4	9.7	8	164	186	228	0.2
8-16	.5	153032	73	13	1.0	0.2	0.2	0.0	9.7	4	22.4	1.4	0.1	66.8	10.4	9	200	210	246	0.1
9-20	.5	153278	63	11	0.9	0.2	0.1	0.1	10.5	6	18.9	3.2	T	67.0	13.9	5	184	225	257	0.1
10-14	.4	153491	65	16	1.1	0.3	0.2	0.0	9.3	4	17.5	1.1	T	64.8	8.0	6	184	195	219	0.2
11-9	1.3	153598	43	26	2.0	0.3	0.2	0.1	8.7	4	20.2	3.8	0.1	58.8	8.5	9	172	182	214	0.0
12-12	1.6	153821	36	11	2.8	0.1	0.2	0.1	7.2	5	21.8	1.2	T	59.0	9.8	9	176	188	226	0.1
1961																				
1-12	1.4	154059	37	7	0.7	0.2	0.2	0.1	5.1	6	26.3	1.8	T	56.1	10.6	8	164	184	207	0.1
2-10	1.0	154192	33	5	0.7	0.3	0.2	0.0	8.2	5	23.7	2.6	T	64.1	12.3	7	192	211	230	0.1
3-14	65.0	154356	51	350	7.2	0.3	0.2	0.0	8.4	4	26.9	6.8	0.1	25.1	3.9	13	68	79	130	0.2
4-11	12.0	154611	50	30	1.6	0.3	0.2	0.0	6.4	5	40.1	3.8	0.1	39.2	7.5	12	104	129	175	0.1
5-18	39.0	154833	59	227	7.0	0.3	0.2	0.0	10.7	5	34.1	6.0	0.1	34.4	6.3	9	84	112	149	0.1
6-20	5.0	155083	73	69	5.1	0.3	0.1	0.1	6.9	4	24.5	3.5	T	47.2	7.1	9	132	147	194	0.2
7-17	1.3	155303	85	38	3.4	0.5	0.3	0.1	6.3	3	20.8	6.1	0.1	54.2	7.3	7	152	168	201	0.1
8-25	2.2	155526	68	9	0.6	0.3	0.1	0.1	10.8	4	38.9	1.5	0.2	55.9	8.5	15	160	175	252	0.1
9-19	9.4	155697	63	9	0.7	0.3	0.1	0.0	12.5	4	25.3	5.9	0.1	53.2	8.8	9	152	169	198	0.1

HAYES CREEK AT GLENDALE

Hayes Creek rises in the Shawnee Hills Region northeast of Glendale and flows southwesterly to join Bay Creek. The gaging station at Glendale is 3 miles upstream from the mouth, and the elevation of the gage datum is 375.14 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 18.9 square miles.

The tabulation of water quality data is for the period from November 8, 1961, to August 25, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961 - 1966 were generally similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 10.86 inches above normal to 10.94 inches below normal, based on one station record. The average annual departure was — 1.43 inches.

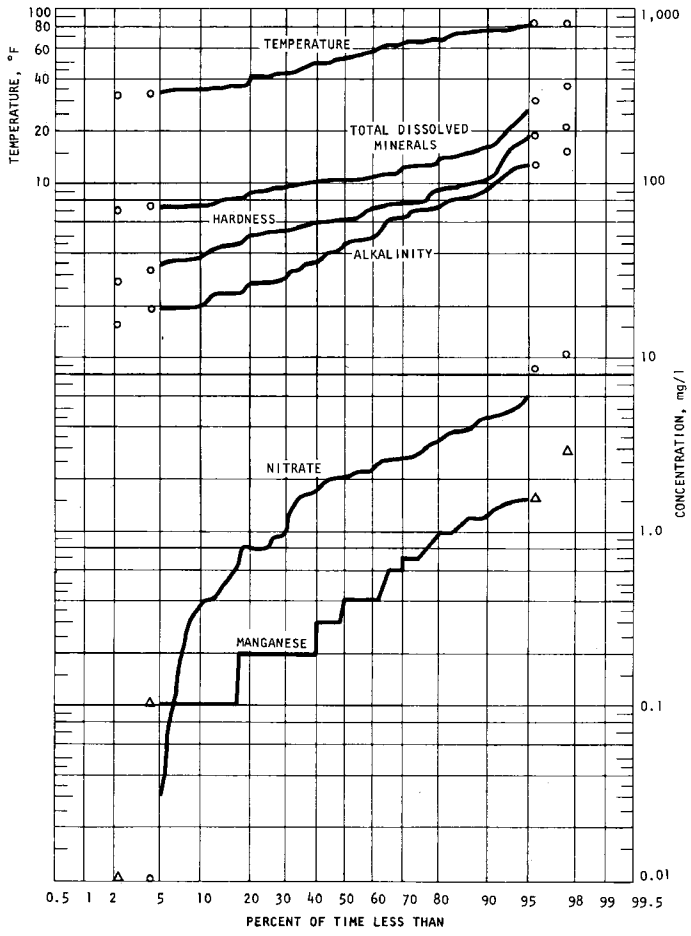
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow ranged between 2.4 cfs/sq mi and 0 cfs/sq mi, with a median flow of 0.11 cfs/sq mi. The minimum average daily flow of record was 0 cfs in several months of 1952 and 1954.

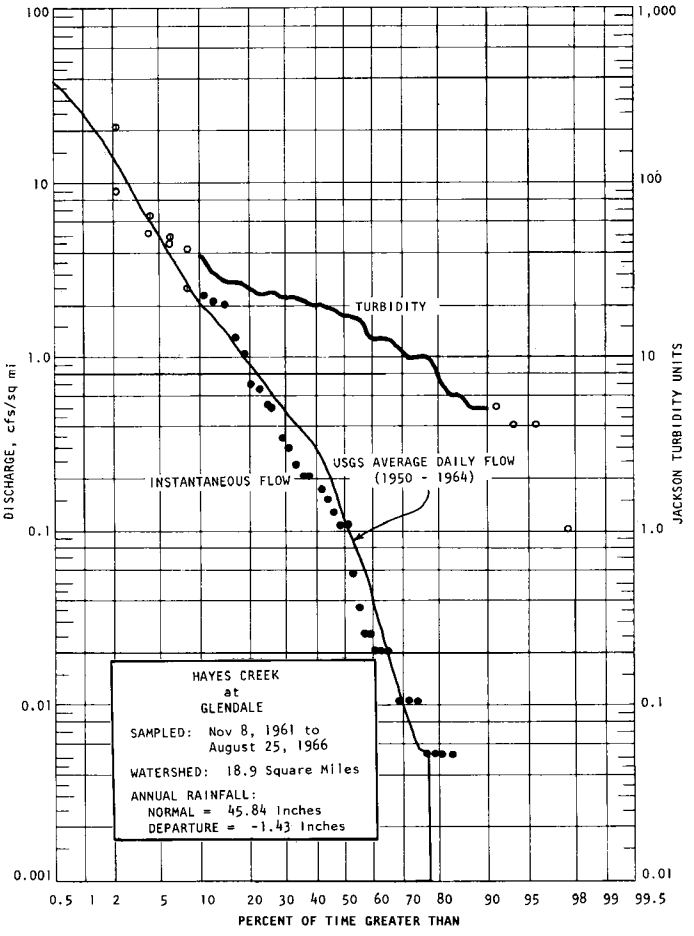
The turbidity was not less than 5 Jtu nor more than 40 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were over 80 F for 6 percent and over 70 F for 20 percent of the time. They were below 50 F for 40 percent and below 40 F for 20 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	20	45	90
Hardness (as $CaCO_3$)	40	60	110
Total dissolved minerals	75	110	160
Nitrate	0.36	2.1	4.5
Manganese	0.1	0.3	1.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-17	0.0	No sample taken, no flow																		
11-8	0.2	156095	44	18	0.9	0.2	0.2	0.0	8.9	3	30.2	2.5	T	24.2	3.5	16	72	75	130	0.1
12-6	25.2	156269	42.5	14	1.1	0.1	0.2	0.0	8.7	3	28.4	2.3	T	13.6	2.4	7	24	44	75	0.1
1962																				
1-25	48.7	156613	37	17	0.6	0.1	0.2	0.0	10.3	4	25.7	3.3	T	12.4	1.7	8	20	38	70	0.1
2-13	12.4	156771	50	6	0.6	0.1	0.2	0.0	9.5	3	31.3	1.6	T	16.6	3.3	5	28	55	99	0.1
3-15	9.5	157009	44	1	0.6	0.2	0.1	0.0	9.5	3	34.4	2.2	0.1	18.7	3.2	6	32	60	99	0.0
4-14	19.0*	157216	53	4	0.4	0.2	0.2	0.0	10.3	2	27.2	2.0	T	16.2	3.0	3	28	53	90	0.2
5-9	3.9	157514	67	6	1.0	0.4	0.1	0.0	8.6	3	31.3	2.1	T	22.4	3.8	7	48	71	105	0.1
6-14	0.2	157816	70	28	1.3	1.5	0.2	0.0	7.2	5	20.2	3.9	T	29.7	5.2	5	76	96	130	0.0
7-18	0.0	158258	78	91	6.4	1.4	0.1	0.1	5.2	2	14.2	3.1	0.1	16.0	2.4	8	48	50	82	0.1
8-15		No sample taken, no flow																		
9-12	0.1	158580	76	31	1.7	1.1	0.2	0.3	7.1	7	27.4	3.7	0.1	28.9	4.7	13	80	92	142	0.0
10-3		No sample taken, no flow																		
10-17		No sample taken, no flow																		
11-7	0.1	158986	47	22	2.3	1.0	0.1	0.1	8.1	5	21.6	2.1	0.2	25.0	4.0	7	64	79	116	0.1
12-13	0.0	159184	33	24	2.2	0.6	0.2	0.0	8.7	10	31.5	3.8	0.2	36.0	6.3	10	88	116	165	0.0
1963																				
1-2	2.4	159336	44	13	1.1	0.2	0.2	0.1	9.3	10	18.3	4.5	T	55.4	6.9	12	156	167	219	0.4
2-14	4.5	159545	32	5	0.7	0.2	0.2	0.0	7.8	5	39.1	2.8	0.1	19.0	3.8	5	24	63	115	0.1
3-20	45.1	159810	52	23	1.4	0.2	0.1	0.0	9.7	2	27.2	3.4	0.1	10.4	2.4	8	20	36	77	0.2
4-4	6.6	159917	58	5	0.8	0.4	0.1	0.0	9.2	3	34.2	2.6	0.1	20.6	3.0	7	38	64	94	0.2
5-9	3.0	160146	67	13	1.2	0.5	0.1	0.0	9.3	3	29.8	2.0	0.2	21.8	4.6	6	52	74	109	0.1
6-12	0.5	160398	79.5	18	1.4	1.21	0.2	0.2	7.0	3	16.3	2.7	0.1	20.8	3.9	17	64	68	102	0.1
7-10	0.0	160617	75	39	2.0	3.04	0.2	0.1	9.3	6	18.7	4.9	0.1	31.5	5.8	13	100	103	156	0.1
8		No sample taken, no flow																		
9		No sample taken, no flow																		
10-10		No sample taken, no flow																		
11-13		No sample taken, no flow																		
12-12	0.0	161855	34.5	23	1.4	.71	0.2	0.1	9.3	29	74.3	8.7	T	65.0	8.4	26	128	197	306	0.0
1964																				
1-8	0.0	162009	34.5	9	0.4	.69	0.1	0.1	10.3	46	98.1	10.3	T	68.0	10.2	44	132	212	367	0.0
2-5	0.2	162218	42	13	1.0	.36	0.1	0.2	7.4	7	35.6	2.2	T	23.6	4.1	6	40	76	125	0.0
3-3	0.4	162358	50	7	0.6	.15	0.2	0.1	5.5	7	46.5	1.4	0.2	21.2	5.8	9	36	77	129	0.1
4-9	10.2	162635	53	4	0.4	.22	0.1	0.0	9.3	5	33.5	2.2	T	16.0	2.9	9	28	52	89	0.0
5-14	3.7	162947	64	12	1.1	.23	0.2	0.0	9.4	5	29.0	0.4	T	19.4	3.3	7	40	62	103	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
6-2	0.2	163101		25	1.7	.42	0.1	0.0	7.1	4	16.9	2.4	0.0	21.4	4.5	4	56	72	110	0.0
7-9	0.5	163476	79	52	4.2	.98	0.1	0.0	6.5	6	15.4	4.7	0.1	17.8	4.3	2	48	62	103	0.1
8-13		No sample taken, no flow																		
9-3		No sample taken, no flow																		
10-15		No sample taken, no flow																		
11-12		No sample taken, no flow																		
12-10	0.4	164816	37	20	1.4	.12	0.1	0.2	6.4	5	33.9	1.9	T	14.3	2.1	17	24	44	107	0.0
1965																				
1-14	5.7	165083	36	10	0.5	.00	0.1	0.2	11.6	6	33.3	2.7	0.1	15.3	3.2	10	28	51	99	0.1
2-10	400.0	165225	53	47	2.8	.08	0.1	0.1	9.3	3	20.0	1.8	0.0	8.8	1.5	9	20	28	76	0.3
3-12	13.5	165551	44	10	0.6	.10	0.0	0.1	9.5	10	29.4	0.8	T	16.0	3.2	13	36	53	90	0.1
4-16	41.1	165687	56	13	1.1	.13	0.2	0.0	11.1	7	24.7	1.0	T	12.8	2.4	11	30	42	75	0.1
5-19	0.7	166010	72	19	1.6	.65	0.1	0.2	8.5	7	22.4	0.9	T	24.5	4.6	12	72	80	119	0.0
6-16	2.1	166328	69	20	1.7	.33	0.1	0.1	11.3	5	22.4	0.8	T	16.9	3.6	10	48	57	106	0.4
7-14	1.1	166649	73	17	1.3	.59	0.1	0.1	6.7	6	12.8	0.5	T	17.2	3.2	3	36	56	83	0.1
8-13	0.0	167013	83	27	1.9	1.20	0.1	0.2	6.4	9	15.4	1.7	T	28.9	6.1	8	84	97	130	0.0
9-9	0.1	167205	68	28	1.6	.76	0.1	0.1	4.6	6	19.3	0.4	0.1	21.9	2.7	12	64	65	114	0.3
10-7	3.4	167331	60	24	1.9	.27	0.1	0.1	5.8	7	30.4	0.0	0.0	18.4	3.9	6	32	62	105	0.3
11-4	0.2*	167530	55	11	1.6	1.59	0.2	0.1	8.6	9	27.8	0.0	0.1	30.8	5.5	12	84	100	149	0.1
12-9	0.4*	167826	36	20	4.3	.32	0.0	0.1	4.4	8	35.0	0.1	0.1	28.7	4.6	13	72	90	153	0.2
1966																				
1-6	39.1	168097	42	19	1.4	.29	0.1	0.2	6.4	5	33.3	0.9	T	15.8	1.6	9	24	46	97	0.3
2-9	91.6	168248	34	23	3.0	.25	0.1	0.1	3.4	6	26.7	0.8	0.1	12.6	1.3	7	16	37	84	0.3
3-24	4.0	168600	48	5	0.8	.35	0.1	0.0	8.4	6	37.4	0.6	T	23.5	4.5	13	48	77	143	0.0
4-15	20.4	168758	50	10	0.7	.15	0.1	0.0	9.4	6	32.3	0.8	0.1	16.0	3.2	12	28	53	107	0.0
5-13	126.0	169035	57	43	3.3	.20	0.1	0.1	9.2	4	20.2	0.3	0.0	10.4	1.7	6	20	33	76	0.1
6-10	2.0	169168	65	21	1.9	.35	0.1	0.2	8.5	5	22.0	1.6	0.0	20.0	3.2	6	44	63	96	0.1
7-22		No sample taken, no flow																		
8-25	0.0	169696	63	24	1.3	.80	0.1	0.1	7.7	3	14.4	2.5	T	24.0	4.4	4	64	78	112	0.1
9-17		No sample taken, no flow																		

* USGS average daily discharge

ILLINOIS RIVER AT MEREDOSIA

The Illinois River is an intersectional stream, rising at the junction of the Kankakee and Des Plaines Rivers and flowing through several physiographic regions. The elevation of the gage datum at Meredosia is 418.00 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 25,300 square miles.

Samples were collected and analyzed by the Central Illinois Public Service Company. Analyses of these data are for the periods from March 2, 1955, to April 1, 1960, and from May 13, 1960, to June 25, 1965; tabulations were made through May 26, 1966. Data are also shown graphically.

Annual rainfall during the first sampling period was from 11.57 inches above normal to 15.09 inches below normal, and in the second period was from 15.38 inches above normal to 12.69 inches below normal, based on records for 16 stations within the drainage basin. Average annual departure was —.97 inch in the first period and —1.65 inches in the second period.

For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.4 cfs/sq mi and was not less than 0.25 cfs/sq mi, with a median flow of 0.543 cfs/sq mi, during the first sampling period (1955-1960). Instantaneous flow values for the second period (1960-1965) were not analyzed.

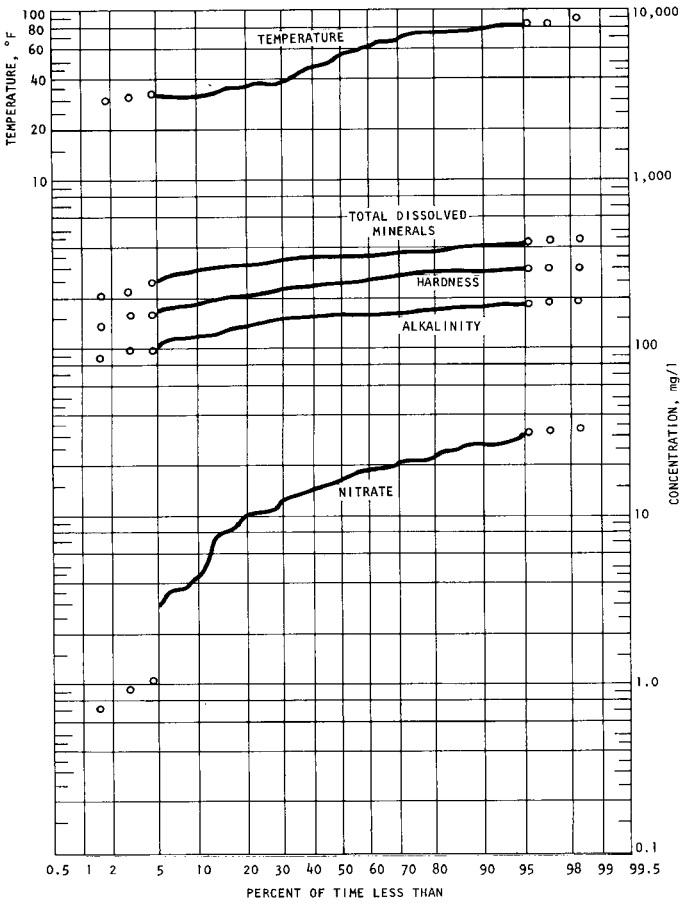
The turbidities did not exceed 240 Jtu (1955-1960) and 210 Jtu (1960-1965) nor were they less than 40 Jtu (1955-1960) or 50 Jtu (1960-1965) for the central 80 percent of the time. Median values were 80 Jtu (1955-1960) and 120 Jtu (1960-1965).

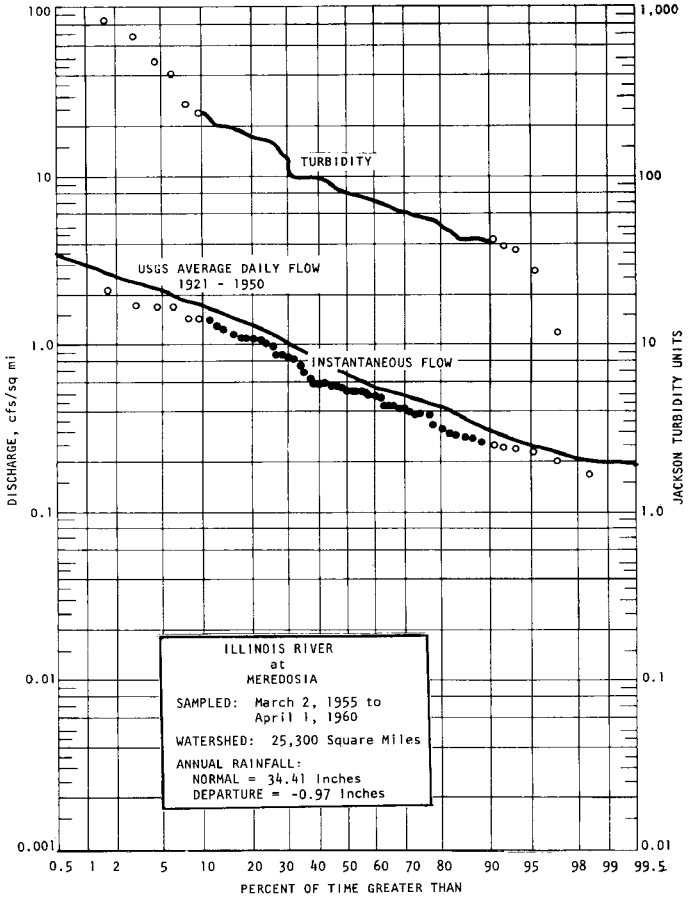
Reported temperatures were over 80 F for 10 (1955-1960) and 14 (1960-1965) percent of the time, and over 70 F for 30 (1955-1960) and 31 (1960-1965) percent of the time. They were below 50 F for 45 (1955-1960) and 36 (1960-1965) percent of the time, and below 40 F for 30 (1955-1960) and 16 (1960-1965) percent of the time.

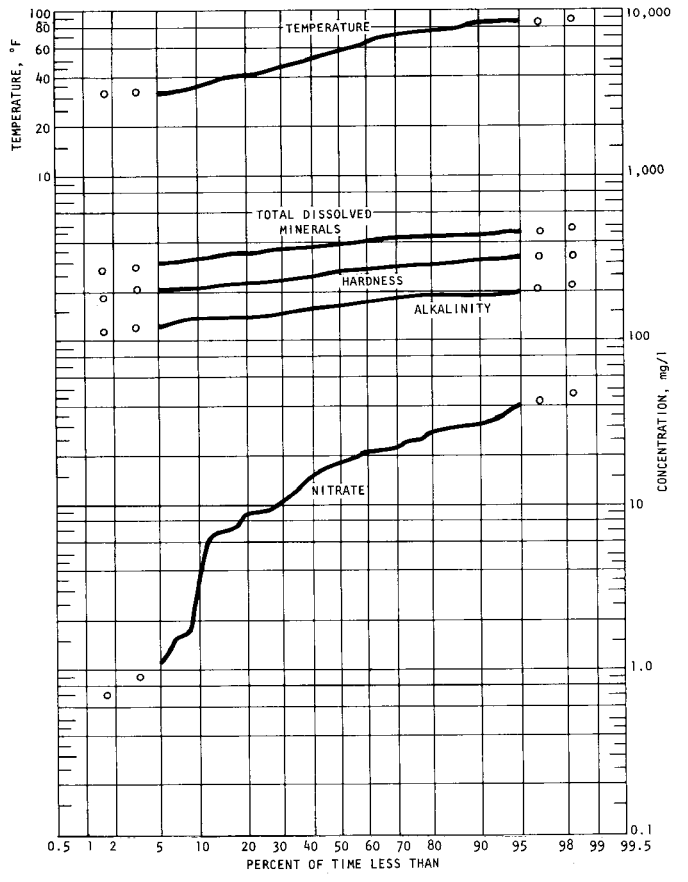
The analyses indicated the following:

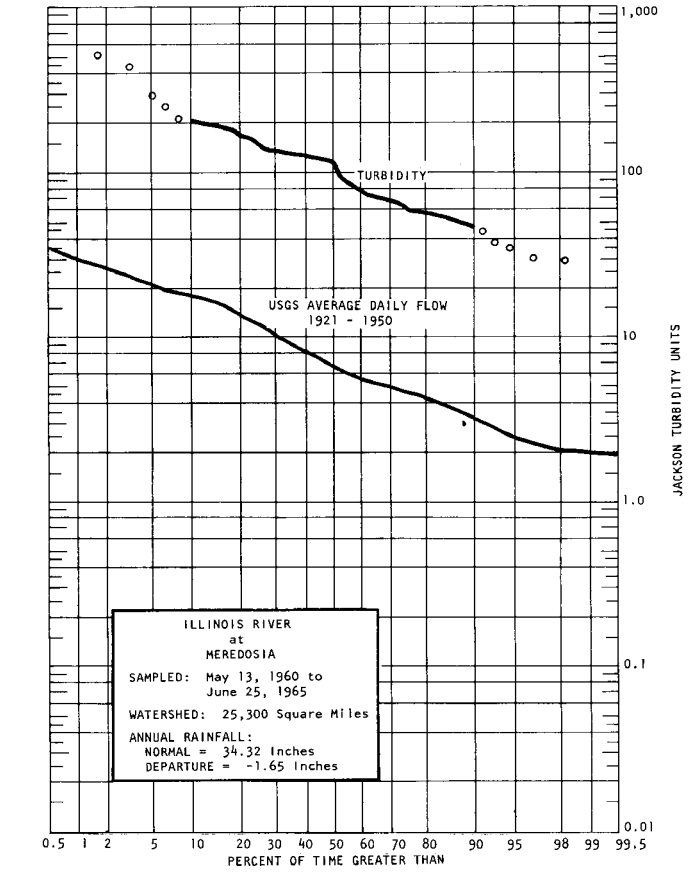
		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1955-1960)	125	160	180
	(1960-1965)	135	155	185
Hardness (as $CaCO_3$)	(1955-1960)	190	245	300
	(1960-1965)	205	255	300
Total dissolved minerals	(1955-1960)	295	360	420
	(1960-1965)	310	380	440
Nitrate	(1955-1960)	4.3	17	2 7
	(1960-1965)	2.9	17.4	30.9
Manganese	(1955-1960)	0	0	0
	(1960-1965)	0	0	0

ILLINOIS RIVER AT MEREDOSIA









Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1955																				
3-2		D-711	38	200	0.2	0			15.8	30	69.4	21.5	0.3	48.8	18.5	23	120	198	300	
4-1		D-741	53	80	0.2	0			15.6	30	93.9	12.6	0.4	66.8	26.8	14	164	278	366	
5-3		D-752	64	193	0.3	0			17.0	21	74.1	21.2	0.1	58.2	22.4	14	152	237	353	
5-28		D-772	72	245	0.1	0			14.8	24	78.4	18.7	0.4	60.1	23.0	13	151	244	337	
7-1		D-789	81	411	0.2	0			16.8	21	76.0	20.6	0.2	56.4	21.5	24	153	229	322	
7-29		D-803	92	102	0.8	0			11.4	32	84.7	19.3	0.1	54.2	20.8	29	145	220	350	
9-1		D-815	77	274	0.0	0			13.4	28	72.9	12.9	0.4	46.1	15.7	27	122	179	307	
9-27		D-833	68	100	0.1	0			11.2	34	75.2	10.2	0.3	48.3	16.8	30	127	189	293	
11-29		D-873	33	60	0.1	0			8.0	40	116.9	10.5	0.5	73.3	25.0	28	168	285	386	
1956																				
1-3	7270.0	D-892	34	56	0	0			5.0	40	93.9	10.9	1.0	65	23.5	28	164	259	343	
1-28	6730.0	D-940	38	28	1.1	0			14.4	41	101.8	8.2	0.6	67.5	18.5	37	163	244	380	
3-3	25600.0	D-958	48	171	0.1	0			11.4	28	82.4	21.5	0.2	54.6	18.4	21	124	213	308	
3-30	9690.0	D-973	49	72	0	0			9.8	33	110.8	27.3	0.3	70.4	25.6	27	161	281	415	
4-28	9720.0	D-986	58	39	0	0			10.4	38	38.9	19.7	0.3	69.1	25.3	34	173	276	410	
6-1	29300.0	D-1009	74	170	1.1	0			11.6	22	78.4	20.0	0.6	50		4	134	236	281	
6-30	14800.0	D-1034	84	210	0	0			12	34	89.9	27.3	0.1	63.4	20.8	29	152	243	366	
7-28	10700.0	D-1070	84	44	0	0			11	29	78.9	1.0	0.3	55.9	18.1	23	145	214	313	
9-4	6890.0	D-1090		101	0	0			8	36	84.4	18.5	0.1	57.5	20.7	31	147	228	330	
9-29	4280.0	D-1115	69	74	0	0			8.6	33	99.8	11.0	0.1	58.7	20.2	32	145	229	356	
11-2	6040.0	D-1122	59		0	0			7.2	47	100.3	17	0.1	56.7	20.3	44	140	225	366	
11-30	5060.0	D-1145	38	68	0	0			14.2	47	89.4	12.2	0.4	59.1	21.0	35	152	234	361	
12-28	14200.0	D-1162	38	64	0.1	0			6.2	52	81.3	12.2	0.6	55.9	18.5	64	196	215	383	
1957																				
1-31	15500.0	D-1180	38	79	0.1	0			6.6	35	69	3.5	0.6	55.5	17.4	19	135	210	301	
2-28	18600.0	D-1202	46	172	0.1	0			9.0	32	96.4	18.1	0.3	61.1	20.9	28	146	238	335	
3-29	12300.0	D-1223	43	102	0	0			10.2	32	116	19.7	0.1	65.9	26.3	31	162	272	392	
4-27	36600.0	D-1238	67	490	0.1	0			10.8	19	80.7	16.6	0.4	54.8	19.1	14	126	215	306	
7-1	31800.0	D-1289	78	206	0.1	0			12.8	15	53.4	21.2	0.3	41.7	14.5	11	98	163	247	
8-15	12900.0	D-1317	86	41	0.1	0			8.2	26	78.4	3.7	0.3	60.4	23.7	16	167	248	347	
9-12	7440.0*	D-1333	74	68	0.2	0			9.8	41	108.3	12.2	0.5	65.5	24.5	31	158	264	389	
9-23	6080.0	D-1342	68	49	0.2	0			14.8	43	107	10.9	0.3	61.5	24.2	37	159	253	373	
11-8	8430.0	D-1361	49	44	1.0	0			8.2	36	100	12.9	0.2	61.1	23.3	28	150	248	380	
11-30	13000.0	D-1376	38	82	0.2	0			10.6	31	115.7	14.4	0.1	71.6	27.7	17	162	292	398	
1958																				
1-10	16900.0	D-8	36	64	0.1	0			10.4	24.9	104.6	6.0	0.6	73.6	26.7	12.4	178	292	351	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1958																				
2-8	12400.0	D-23	33	72.6	0.1	0			8.2	32.8	106.8	0.9	0.6	73.2	28.3	21.3	193	292	385	
3-8	27600.0	D-43	38	170.0	0.1	0			8.8	24.9	89.8	8.2	1.3	56.0	20.7	17.3	137	232	300	
4-4	13400.0	D-62	54	86.0	0.2	0			12.8	30.4	115.1	15.4	0.1	73.2	29.9	20.8	183	300	392	
5-6	15100.0	D-77	60		0.1	0			9.8	32.8	107.3	4.3	0.4	73.6	29.7	15.7	189	300	388	
6-9	13300.0	D-I04	76	152.4	0	0			10.2	31.6	94.8	10.9	0.1	60.8	22.5	26.6	156	240	352	
7-2	42900.0	D-131	78	91.6	0.1	0			12.4	19.5	78.2	20.2	0.1	60.4	20.3	19.7	157	244	337	
8-1	43600.0	D-178	83	42.2	0.1	0			11.8	15.2	54.5	15.1	0.2	46.0	17.5	17.8	146	188	282	
9-3	11000.0	D-194	79	100	0.1	0			9.0	27.3	79.7	8.7	0.1	64.0	23.7	19.2	176	252	353	
10-1	5720.0	D-219	61	37	0.1	0			19.6	35.2	100.3	24.2	0.1	66.5	23.1	37.1	171	268	390	
10-31	6170.0	D-251	58	49.2	0	0			11.4	44.4	98.4	18.5	0.3	66.5	23.2	36.8	169	268	382	
12-3	10300.0	D-269	33	139	0.1	0			36.8	39.5	99.6	31.7	0.2	69.2	22.7	40.8	174	272	410	
12-31	9450.0	D-290	33	59.2	0.1	0			14.2	38.3	96.0	14.5	0.1	66.5	23.9	31.1	172	268	377	
1959																				
2-3	14000.0	D-309	32	44	0.1	0			12.4	36.5	74.8	15.1	0.1	52.8	17.9	30.0	137	208	305	
2-28	53600.0	D-331	36	12	0.1	0			9.8	21.9	42.6	17.6	0.2	34.8	11	19.5	88	136	206	
4-1	35600.0	D-347	47	100	0.1	0			12.0	23.7	93.6	27.3	0.1	69.2	25.9	16.1	167	288	384	
4-28	24800.0	D-359	59	850	0	0			11.2	25.6	93.5	27.3	0.4	64.8	22.9	20.3	155	260	336	
5-29	27000.0	D-385	75	131	0.4	0			27.4	28.0	91.7	17.6	0.2	66.5	26.5	18.9	177	280	399	
7-1	10300.0	D-479	80	78	0	0			4.0	42.0	106.8	21.2	0.2	64.7	27.2	26.9	168	280	396	
8-4	10900.0	D-501	80	59.2	0.1	0			5.6	42.5	92.4	0.7	0.4	59.5	19.3	30.8	141	240	359	
9-1	9960.0	D-525	79	69	0	0			8.8	36.5	89.0	18.1	0.1	59.0	21.4	30.2	149	232	361	
9-30	14300.0	D-551	69	178	0.1	0			10.4	46.2	68.0	13.6	0.2	49.8	21.0	23.2	122	200	321	
10-31	12300.0	D-663	52	81	0.1	0			13.2	34.0	118.2	4.3	0.2	71.6	27.6	18.8	165	300	422	
12-2	15100.0	D-703	36	93.5	0	0			12.8	44.9	107.7	27.3	0.6	72.0	28.0	25.8	162	300	449	
12-30	20600.0	D-730	40	240	0.1	0			19.4	32.2	108.1	32.7	0.5	73.5	28.7	25.5	181	300	440	
1960																				
2-2	27300.0	D-752	34	58	0.1	0			18.6	33.4	107.0	33.2	0.4	72.7	30.8	20.4	177	312	425	
3-4	20600.0	D-772	33	77	0.1	0			12.4	29.7	104.6	26.0	0.2	70.8	28.1	20.7	178	292	426	
4-1	43000.0	D-800	45	688	0	0			10.0	24.3	45.9	24.2	0.5	40.0	14.7	13.8	98	154	222	
5-13	33500.0	D-826	54	35.4	0.1	0			11.6	23.1	93.9	21.5	0.4	75.7	26.8	10.2	184	300	399	
6-1	39000.0	D-850	69	118	0	0			9.2	24.9	84.0	43.5	0.2	67.4	23.4	20.5	164	260	354	
6-30	54800.0	D-915	72	164	0	0			9.2	20.7	48.6	21.2	0.1	50.2	20.0	4.6	127	204	262	
8-4	12500.0	D-970	84	137	0	0			8.6	28.5	87.3	16.4	0.3	73.0	26.9	16.7	193	292	398	
9-2	7390.0	D-I041	86	84	0	0			4.0	31.6	84.7	14.4	0.4	63.9	23.4	20.8	170	256	378	
10-31	6420.0	D-1079	53	67.5	0.1	0			6.6	34.6	111.6	15.4	0.3	63.1	23.2	38.0	168	252	386	
12-6	7130.0	D-5	48	54.5	0.1	0			9.2	35.9	94.3	24.2	0.1	69.6	25.1	26.9	175	276	390	
12-30	7840.0	D-10	33	130.0	0	0			9.6	38.9	100.5	24.3	0.1	71.6	26.0	30.7	180	276	403	
1961																				
2-1	7190.0	D-49		47.5	0.1	0			11.0	47.4	105.9	26.5	0.1	68.3	24.2	49.2	185	272	441	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
2-27	11700.0	D-72	42	65.5	0.2	0			6.6	38.9	81.5	24.3	0.4	50.4	20.6	32.2	131	202	333	
4-3	20000.0	D-94	50	44	0.2	0			9.6	26.8	108.8	28.4	0.3	69.1	21.9	33.9	169	268	380	
5-1	34900.0	D-129	54	124	0.1	0			5.4	21.9	75.6	31.5	0.3	58.2	23.5	17.5	150	246	344	
5-31	13800.0	D-144		134.5	1.1	0			6.0	28.5	92.1	19.7	0.4	68.3	26.2	20.5	179	280	364	
7-1	15600.0	D-187	78	206.5	0.1	0			8.6	23.7	69.2	20.0	0.5	50.4	17.6	24.2	136	204	304	
7-31	17800.0	D-219		210	0	0			5.6	16.7	62.4	21.5	0.3	50.7	18.3	21.4	148	204	311	
10-3	51000.0	D-348	60	93.6	0.1	0			9.2	36.2	57.2	22.7	0.3	45.6	16.5	45.6	124	184	276	
10-30	15000.0	D-376	56	156.5	0.2	0			10.2	31.3	105.9	29.6	0.2	79.6	30.8	22.2	205	320	417	
12-1	29000.0	D-404	40	70.0	0.2	0			7.2	25.8	236.7	17.2	0.2	79.6	31.6	15.4	216	328	416	
12-29	17500.0	D-8	34	59.0	0	0			12.4	40.4	116.4	8.9	0.1	78.3	30.5	28.7	208	326	442	
1962																				
1-29		D-43	32	29	0.1	0			9.8	45	87.1	11.0	0.2	69.1	32.2	18	186	305	409	
3-1		D-83	33	132	0.0	0			9.6	26	80.9	9.1	0.8	64.9	26.5	13	180	271	352	
4-4		D-114	46	58	0.2	0			16.6	21	59.3	18.1	0.2	55.3	20.9	10	143	224	308	
4-30		D-142	66		0.0	0			17.2	27	85.1	1.1	0.1	69.2	28.1	5	181	288	378	
5-31		D-172	73	282	0.2	0			14.0	23	80.5	37.0	0.1	61.8	24.6	27	180	256	364	
6-29		D-214	83	151.5	0.1	0			5.8	30	82.4	1.7	0.3	61.1	25.6	16	171	258	349	
7-30		D-254	76	54.5	0.1	0			6.2	24	70.7	13.0	0.3	64.9	24.3	3	169	262	352	
9-5		D-282	74	77.5	0.1	0			11.8	39	76.4	8.7	0.6	54.1	21.2	25	143	222	348	
10-4		D-314	61	149.5	0.1	0			7.2	36	82.0	11.4	0.2	52.2	20.9	31	143	216	301	
10-31		D-370	50	67	0.0	0			14.8	40	83.8	27.3	0.2	62.2	21.9	27	147	245	377	
11-30		D-392	42		0.1	0			19.2	46	95.3	48.4	0.4	62.2	23.6	46	155	252	411	
1963																				
1-31		D-68	32	55	0.1	0			20.6	53	87.9	42.9	0.1	73.9	26.0	39	184	292	435	
2-28		D-99	32	134	0.1	0			8.6	50	105.9	28.0	0.8	64.0	22.7	54	173	253	458	
4-2		D-132	60	200	0.1	0			10.0	33	81.3	9.2	0.8	54.8	20.3	26	146	220	338	
5-1		D-159	59	506	0.0	0			9.6	41	96.6	6.9	0.1	62.5	22.4	28	157	248	363	
5-31		D-189	69	106	0.2	0			28.0	43	99.6	27.3	0.1	65.2	24.5	33	153	264	423	
7-1		D-241	88	65	0.1	0			6.4	40	104.4	7.9	0.8	57.9	22.5	38	152	237	371	
7-30		D-265	84	87	0.0	0			8.4	43	106.3	19.7	0.2	56.0	21.0	42	140	226	397	
9-4		D-309	78	63	0.1	0			10.2	47	108.1	17.2	0.2	66.7	22.8	38	153	260	403	
9-30		D-336	69	70	0.0	0			8.8	48	98.0	6.9	0.2	57.5	21.8	42	156	233	379	
10-30		D-371	67	38	0.0	0			10.2	52	99.6	9.4	0.3	60.0	21.5	45	160	238	373	
11-27		D-393	48	30	0.0	0			6.6	53	98.0	17.6	1.0	58.8	22.6	47	155	240	413	

Date	nstanta cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
1-2			39	50.5	0.1	0			8.8	48	105.4	21.5	0.6	60.4	22.4	44	166	243	446	
2-4		D-36	40	180	0.1	0			8.0	26	89.4	7.2	0.9	55.8	20.4	21	142	223	338	
3-2		D-69	42	52	0.2	0			7.8	55	103.2	7.1	4.4	59.2	22.4	50	176	240	410	
4-1		D-104	44	188	0.1	0			14.0	58	114.2	21.2	0.6	64.2	26.8	43	158	271	428	
4-28		D-137	61	247	0.0	0			12.4	25	72.9	24.6	0.2	51.8	18.6	20	123	206	336	
6-1		D-166	72	126	0.1	0			10.2	50	131.6	0.9	0.2	80.0	29.1	22	183	320	453	
6-29		D-206	86	190.5	0.1	0			5.6	32	84.4	13.8	0.8	58.1	21.9	23	149	235	366	
8-3		D-245	85	73	0.1	0			12.2	37	95.1	9.4	0.2	54.5	21.3	33	145	224	370	
8-28		D-274	74	118.5	0.1	0			5.4	41	88.7	15.7	0.2	58.5	20.6	30	145	231	370	
9-28		D-310	66	82.5	0.1	0			9.0	52	94.8	21.2	0.3	57.3	20.4	43	138	227	403	
10-27		D-342	56	58	0.1	0			7.4	48	97.2	2.9	0.3	56.9	17.6	42	141	215	377	
11-27		D-381	38	136.5	0.1	0			8.2	57	108.1	10.0	0.2	57.3	21.6	39	137	232	409	
12-28			44	138	0.0	0			7.2	88	113.9	12.3	0.6	66.0	24.6	61	162	266	487	
1965																				
1-28		D-39	36	125	0.1	0			13.2	42	93.9	14.4	0.3	59.0	21.4	21	118	235	363	
3-2		D-179	47	433	0.1	1.5			13.6	39	102.5	21.2	0.2	67.2	23.2	22	139	263	401	
3-26		D-202	45	164	0.1	0			9.0	38	112.4	30.3	0.3	72.2	24.0	26	150	279	431	
4-26		D-245	57	125	0.2	0			8.4	30	102.5	30.9	0.6	67.2	25.5	22	150	273	389	
5-24		D-385	76	141.5	0.0	0			3.4	33	107.5	0.7	0.3	75.0	26.4	10	167	296	380	
6-25		D-445	78	182	0.1	0			4.0	47	105.9	1.6	0.2	66.4	27.2	27	170	278	406	
7-30		D-459	80	73.5	0.1	0			9.2	48	98.4	17.0	0.2	63.2	25.6	32	155	263	417	
8-27		D-540	80		0.0	0			5.6	45	90.4	17.2	0.2	54.4	19.8	37	130	217	370	
9-27		D-575	62	183	0.1	0			10.4	26	79.3	24.2	0.2	66.4	26.1	15	175	273	366	
11-29		D-674	48	121.2	0.1	0			12.4	47	118.7	38.1	0.1	86.0	30.2	33	198	339	470	
12-30		D-14	42	228	0.0	0			11.2	29	91.7	6.6	0.1	70.8	27.9	8	170	292	342	
1966																				
2-1		D-71	37	50	0.0	0			9.4	44	129.7	13.3	0.2	92.8	37.5	25	237	386	531	
2-28		D-182	46	93.5	0.2	0			11.6	38	95.3	13.6	0.2	67.2	24.4	27	170	268	364	
3-25		D-214			0.0	0			8.0	29	102.3	28.8	0.2	80.0	30.4	15	195	327	440	
4-29		D-257	58	530	0.2	0			7.6	17	84.9	33.2	0.3	63.2	25.0	12	156	261	361	
5-26		D-358	66	81.5	0.0	0			5.4	19	63.0	2.7	0.8	53.6	21.1	0	133	221	236	

*USGS average daily discharge

ILLINOIS RIVER AT PEORIA

The Illinois River is an intersectional stream, rising at the junction of the Kankakee and Des Plaines Rivers and flowing through several physiographic regions to join the Mississippi near Grafton. The river is not gaged at Peoria. The drainage basin above Peoria has an area of approximately 12,680 square miles.

Discharge information presented was synthesized from USGS records of mean daily flows in the Illinois at the Kingston Mines gage, and the records for the Mackinaw River and Kickapoo Creek.

Tabulations of water quality data are for the periods from June 28, 1957, to September 29, 1961, and from November 2, 1961, to September 1, 1966. These quality data and the computed discharge data are also summarized graphically.

Annual rainfall during the first sampling period was from 11.57 inches above normal to 7.82 inches below normal, and in the second period was from 14.76 inches above normal to 12.69 inches below normal, based on records for 10 stations within the drainage basin. Average annual departure as +1.27 inches in the first period and –2.05 inches in the second period.

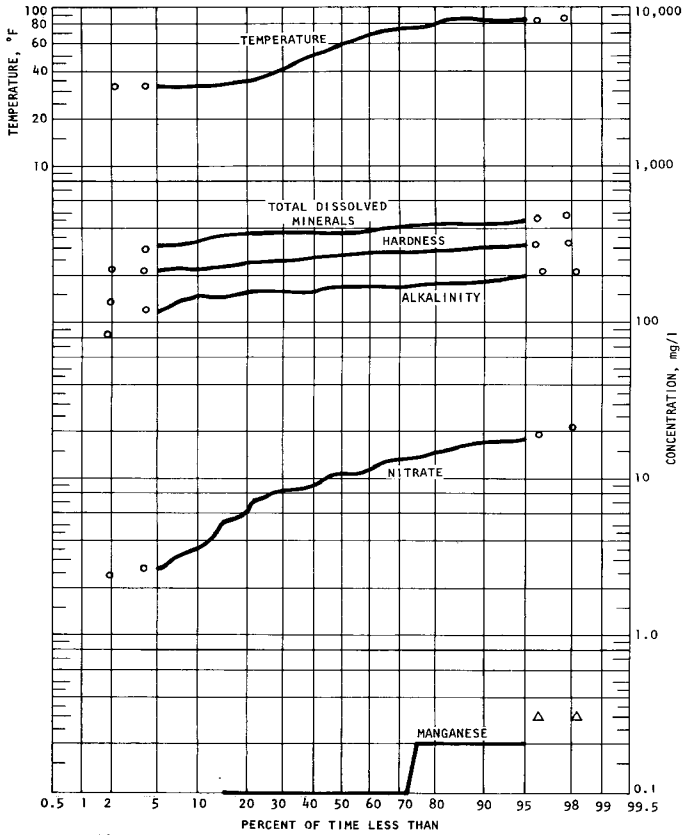
For 80 percent of the time, in the interval between 10 and 90 percent, the computed discharge did not exceed 1.96 cfs/sq mi (1957-1961) or 1.83 cfs/sq mi (1961-1966), and was not less than 0.45 cfs/sq mi (1957-1961) or 0.33 cfs/sq mi (1961-1966). Median flows were 0.73 cfs/sq mi (1957-1961) and 0.63 cfs/sq mi (1961-1966).

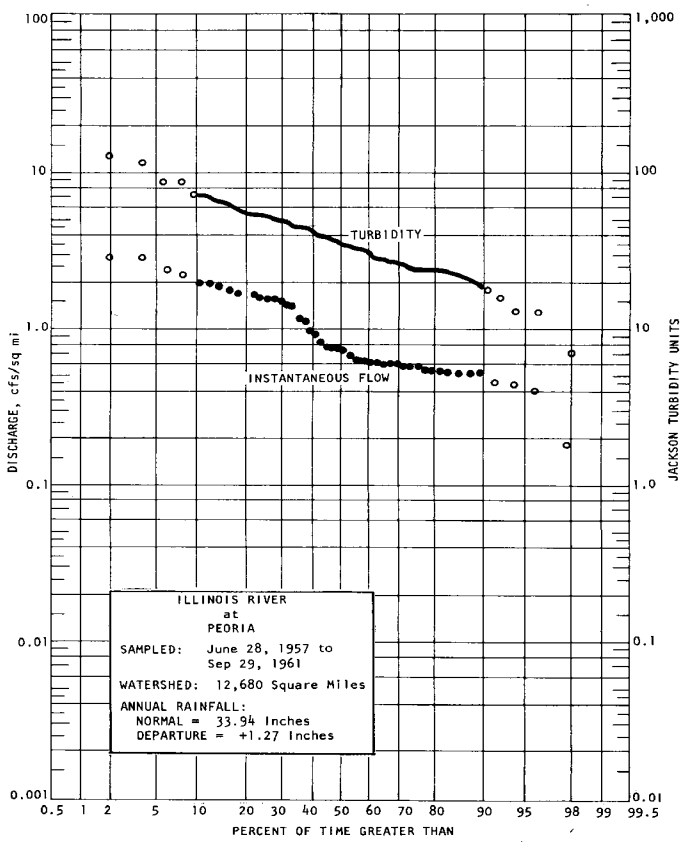
Turbidities were not less than 15 Jtu (1957-1961) and 25 Jtu (1961-1966) nor more than 70 Jtu (1957-1961) and 80 Jtu (1961-1966) for the central 80 percent of the time, with median values of 35 Jtu (1957-1961) and 40 Jtu (1961-1966).

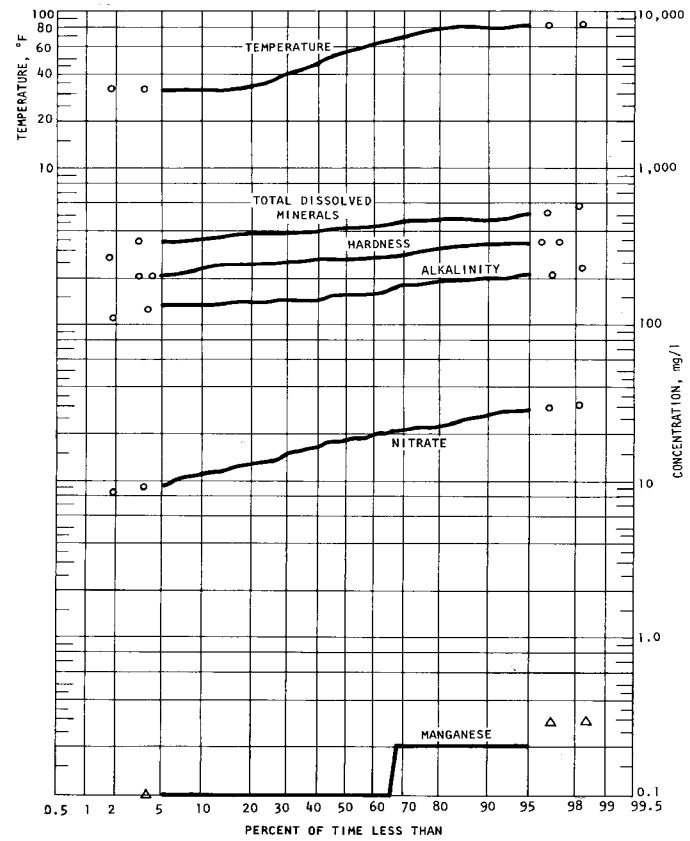
Reported temperatures were over 80 F for 16 (1957-1961) or 17 (1961-1966) percent of the time, and over 70 F for 34 (1957-1961) or 27 (1961-1966) percent of the time. They were below 50 F for 40 (1957-1961) or 41 (1961-1966) percent of the time, and below 40 F for 28 (1957-1961) or 29 (1961-1966) percent of the time.

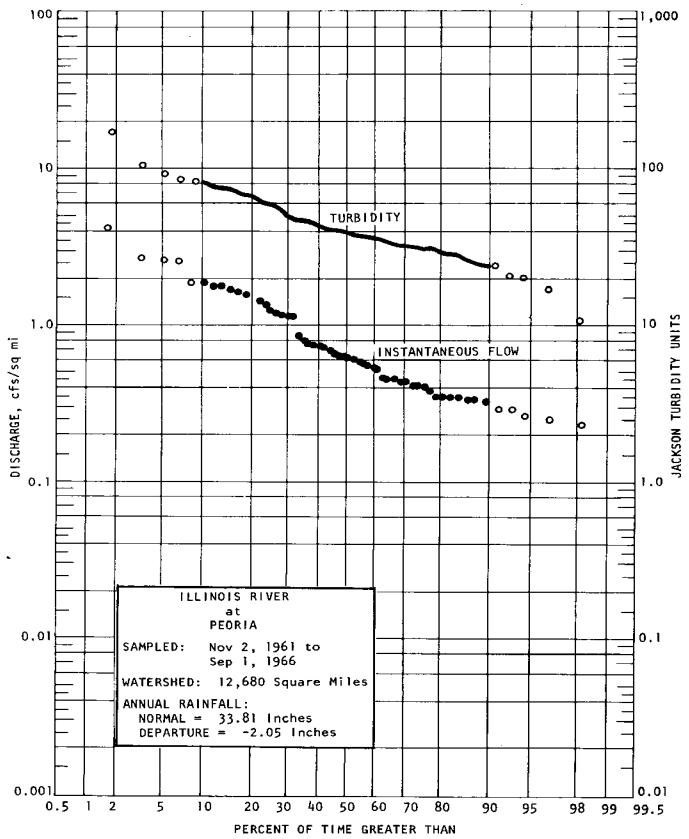
Analyses indicated the following :

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1957-1961)	135	155	185
	(1961-1966)	135	155	210
Hardness (as $CaCO_3$)	(1957-1961)	220	265	320
	(1961-1966)	235	260	340
Total dissolved minerals	(1957-1961)	330	380	440
	(1961-1966)	365	410	475
Nitrate	(1957-1961)	3.5	10.4	17.7
	(1961-1966)	11.2	18.8	26.2
Manganese	(1957-1961)	T	0.1	0.2
	(1961-1966)	0.1	0.1	0.2


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
PERCENT OF TIME LESS THAN


DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
TURBIDITY
INSTANTANEOUS FLOW
ILLINOIS RIVER
at
PEORIA
SAMPLED: June 28, 1957 to Sep 29, 1961
WATERSHED: 12,680 Square Miles
ANNUAL RAINFALL:
NORMAL = 33.94 Inches
DEPARTURE = +1.27 Inches
PERCENT OF TIME GREATER THAN


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
PERCENT OF TIME LESS THAN


DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
TURBIDITY
INSTANTANEOUS FLOW
ILLINOIS RIVER
at
PEORIA
SAMPLED: Nov 2, 1961 to Sep 1, 1966
WATERSHED: 12,680 Square Miles
ANNUAL RAINFALL:
NORMAL = 33.81 Inches
DEPARTURE = -2.05 Inches
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-28	14100.0	143720	75	44	2.0	0.1	0.5	0.1	10.1	24	109.0	17.7	T	70.5	27.7	18	168	291	407	
8-16	7560.0	144191	83	29	1.0	0.1	0.5	T	1.4	26	102.6	5.6	T	64.5	25.7	19	160	267	348	
9-20	3940.0	144652	73	28	2.7	0.1	0.5	0.3	6.7	37	102.6	7.5	T	66.2	24.8	25	156	268	373	
12-3	9460.0	145235	34	51	1.5	0.1	0.5	0.2	9.5	30	143.2	8.1	0.2	82.5	30.5	23	184	332	477	
12-20	11540.0	145320	39	39	3.8	0.1	0.4	0.2	7.6	29	116.2	10.8	0.2	73.5	25.1	20	160	287	398	
1958																				
2-3	9250.0	145640	33	40	2.2	0.1	0.5	0.1	7.4	39	111.5	17.8	T	72.0	25.9	29	164	286	429	
3-3	24860.0	145899	36	60	3.5	0.2	0.3	0.1	7.1	29	80.4	8.4	T	53.5	19.4	16	122	213	311	
4-1	10380.0	146140	51	24	1.1	0.1	0.1	0.1	6.5	28	126.7	7.8	T	71.8	29.3	25	176	300	424	
4-30	9950.0	146479	54	21	2.2	0.2	0.5	0.1	2.5	31	122.2	3.5	0.1	72.2	30.0	21	176	304	421	
6-2	7980.0	146747	70	114	4.2	0.2	0.3	0.1	4.6	31	107.0	2.4	T	63.4	24.6	26	160	259	374	
7-1	23130.0	147062	76	35	1.6	0.1	0.3	0.2	9.0	19	97.5	8.2	0.1	71.4	26.1	6	164	286	370	
8-5	15090.0	147348	82	28	3.6	0.2	0.3	0.0	8.7	23	91.1	10.4	T	65.0	24.8	22	176	265	360	
9-2	6620.0	147591	74	37	2.8	0.1	0.5	0.1	15.9	25	91.9	7.5	T	63.5	23.2	23	168	255	376	
10-3	5580.0	147847	59	64	1.9	0.1	0.6	0.2	6.6	34	92.4	9.3	T	57.4	21.8	34	156	233	378	
10-31	5650.0	148062	53	27	1.7	0.1	0.5	0.2	6.3	41	97.7	2.7	T	62.1	20.8	30	144	241	374	
12-1	6870.0	148351	32	49	2.6	0.2	0.2	0.1	6.4	32	105.5	5.7	T	62.4	26.2	23	154	262	380	
12-31	7400.0	148642	32	18	0.5	0.2	0.2	0.1	6.7	39	90.7	8.2	T	63.0	19.6	42	152	239	355	
1959																				
2-2	6700.0	148821	32	26	1.6	0.1	0.3	0.0	6.5	41	87.2	3.9	0.1	58.7	19.5	40	164	227	371	
3-2	35440.0	149036	33	45	2.9	0.1	0.2	0.1	6.6	19	52.7	3.4	T	37.1	11.2	13	84	139	218	
3-30	22230.0	149239	45.5	45	2.6	0.2	0.2	0.1	8.8	27	115.4	8.9	T	71.2	27.2	18	164	290	409	
4-30	19500.0	149490	58	71	3.5	0.3	0.1	0.1	6.1	25	118.9	11.8	T	77.2	25.8	17	168	299	397	
6-1	18180.0	149820	75	64	3.2	0.1	0.5	0.1	9.9	22	101.8	5.8	T	68.3	26.3	14	168	279	380	
7-2	7870.0	150009	77	37	1.9	0.1	0.6	0.1	2.0	37	104.9	4.8	T	64.2	24.4	28	156	261	361	
7-30	9820.0	150299	83	39	2.9	0.1	0.5	0.1	4.8	32	94.6	8.4	T	58.9	19.8	28	140	229	354	
8-31	7320.0	150495	81	48	2.3	0.1	0.7	0.2	5.2	35	94.6	2.8	0.0	63.2	22.9	26	158	252	363	
9-30	7620.0	150734	67	72	3.0	0.2	0.6	0.2	4.1	36	82.5	10.9	T	56.1	18.8	33	144	218	360	
11-2	8120.0	150949	50	26	1.7	0.1	0.5	0.1	4.8	31	116.6	9.8	T	69.4	24.4	31	168	274	402	
11-30	12400.0	151098	34	32	2.1	0.1	0.3	0.1	7.2	29	126.7	14.2	T	81.8	27.1	22	180	316	445	
12-30	21450.0	151324	40	23	1.6	0.1	0.5	0.1	5.2	26	116.2	9.6	0.1	74.0	27.7	19	176	299	391	1.3
1960																				
2-1	21220.0	151561	32	54	1.3	T	0.4	0.1	8.0	48	127.5	15.9	T	79.2	31.5	32	184	328	457	0.9
3-1	17700.0	151773	32	86	2.5	T	0.4	0.1	7.8	31	127.5	17.9	T	80.8	31.3	22	192	331	447	1.0
3-31	29920.0	151972	44	129	3.3	0.2	0.4	0.1	5.4	35	115.0	8.9	0.1	62.6	22.9	34	148	251	387	1.2

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
5-2	27900.0	152194	61	16	1.6	0.1	0.3	0.1	5.9	22	101.6	12.5	T	72.8	27.5	13	176	295	374	0.6
6-2	19940.0	152386	72.5	33	1.8	0.1	0.4	0.1	6.1	23	103.3	15.9	0.1	77.4	30.8	16	202	320	409	1.1
6-30	19560.0	152625	77	49	1.4	T	0.5	0.1	5.8	20	97.1	10.4	T	72.2	27.6	16	192	294	372	0.3
8-1	7960.0	153022	81	24	1.5	0.2	0.4	0.1	5.4	33	100.2	11.5	T	79.2	19.9	31	188	280	402	1.2
9-1	6650.0	153168	83	24	1.6	T	0.5	0.1	4.7	31	89.5	10.5	0.1	63.0	22.7	28	168	255	369	0.9
9-29	6630.0	153377	69	22	1.2	0.1	0.6	0.2	7.6	32	80.6	13.7	0.1	57.4	18.1	32	148	218	334	1.1
12-1	7380.0	153721	36	53	3.0	0.1	0.5	0.3	3.9	32	97.1	14.4	T	66.0	23.6	35	180	262	397	2.1
1961																				
1-3	6930.0	153936	32	13	0.5	0.1	0.6	0.1	4.1	36	92.2	13.2	0.1	61.1	20.4	39	164	237	378	1.4
2-2	2250.0	154131	32	7	1.0	T	0.6	0.2	5.7	45	105.5	17.6	T	70.8	23.8	39	172	275	444	3.6
3-1	8630.0	154293	43	13	1.4	0.1	0.5	0.5	4.3	51	92.8	16.1	0.1	60.9	22.3	43	156	244	392	2.6
3-30	18970.0	154481	48	45	2.7	0.1	0.2	0.1	5.9	24	108.0	19.5	0.1	72.2	26.6	18	168	290	380	1.3
5-1	24450.0	154725	54	55	2.5	0.1	0.3	0.1	6.7	19	95.4	21.8	0.1	66.0	22.1	13	140	256	358	0.8
6-1	7910.0	154948	68	24	0.9	0.0	0.6	0.1	4.3	29	111.9	13.8	T	76.0	25.3	25	180	294	408	0.9
6-29	6910.0	155188	77	24	1.2	0.3	0.5	0.1	1.4	30	99.6	13.7	0.1	66.4	21.2	29	160	253	358	1.1
7-31	7650.0	155387	84.2	27	1.4	0.1	0.7	0.1	2.0	33	86.2	12.5	0.1	55.0	20.1	32	144	220	324	1.6
8-31	5070.0	155569	82.4	53	0.9	0.1	0.6	0.2	4.2	35	98.7	10.5	0.1	64.0	22.4	33	164	252	368	1.1
9-29	3592.0	155737	61.7	34	1.9	0.1	0.4	0.2	6.8	18	82.3	10.7	T	53.7	18.6	15	124	211	291	0.7
11-2	15130.0	156038	57.2	86	3.5	0.2	0.5	0.2	6.3	28	132.7	13.9	T	86.4	30.4	27	212	341	445	1.7
11-30	19320.0	156208	42.8	32	1.1	0.0	0.2	0.2	8.2	22	117.2	15.2	T	85.6	33.3	16	220	351	460	1.4
1962																				
1-2	7760.0	156407	32	38	1.6	0.1	0.6	0.2	7.1	46	123.8	19.3	T	85.6	30.2	36	212	338	474	2.2
2-1	9400.0	156656	32	32	1.8	0.1	0.3	0.2	7.5	37	112.5	18.7	T	83.4	28.6	27	200	326	435	1.5
3-1	18000.0	156885	32	28	1.2	0.1	0.5	0.1	8.0	34	119.1	18.7	T	82.0	31.0	27	204	333	446	1.4
3-29	52120.0	157103	44.6	90	3.2	0.1	0.5	0.2	7.2	14	65.6	12.7	T	50.5	18.4	4	112	202	269	0.7
4-26	20570.0	157365	62.6	32	1.6	0.1	0.4	0.1	1.9	26	108.6	13.9	0.0	80.0	30.6	18	204	326	420	1.1
5-31	15620.0	157696	73.4	73	2.7	0.2	0.3	0.2	6.6	26	105.7	13.5	T	75.0	28.1	21	192	303	401	1.0
6-28	9030.0	157934	79.7	59	2.4	0.1	0.4	0.2	5.7	32	99.6	10.1	T	68.1	24.2	31	180	270	383	0.9
8-2	8100.0	158307	77	42	1.5	0.1	0.4	0.2	3.9	29	86.0	9.7	0.1	63.0	23.5	22	164	254	336	1.0
8-30	8640.0	159052	77.7	36	2.6	0.1	0.7	0.2	2.7	35	82.3	10.9	0.1	53.3	19.4	32	140	213	341	1.2
9-27	5230.0	158698	64.4	47	2.1	0.2	0.5	0.2	4.8	37	89.9	12.6	0.1	60.1	20.1	32	148	233	364	2.1
11-1	5580.0	158950	51.8	41	1.8	0.1	0.7	0.3	6.4	39	96.3	11.2	0.1	63.4	20.1	32	148	241	397	3.0
11-29	5230.0	159090	41.7	47	1.5	0.2	0.7	0.3	5.4	37	97.9	18.8	T	64.1	23.2	32	156	256	401	3.3
1963																				
1-3	4460.0	159304	32	32	1.2	0.1	0.6	0.3	5.3	39	99.6	21.8	0.1	63.0	21.5	54	188	246	421	4.4
1-31	2950.0	159477	32	11	0.6	T	1.1	0.2	6.7	43	113.6	28.2	0.1	67.8	24.7	34	164	271	450	9.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1963																				
2-28	3140.0	159642	32	56	2.6	.3	0.9	0.2	8.2	96	112.5	18.8	0.1	68.9	22.0	68	144	263	506	5.3
3-28	16890.0	159892	33.8	48	1.8	.2	0.5	0.1	8.2	36	106.1	21.6	0.2	68.0	21.9	2	132	260	381	0.8
4-29	6870.0	160095	62.6	44	1.5	.2	0.7	0.2	2.3	35	102.6	11.6	0.9	63.5	20.9	36	160	245	370	1.2
5-29	8010.0	160309	66.2	31	1.7	.1	0.9	0.2	3.2	37	117.2	19.3	0.1	66.2	25.2	39	164	264	418	2.6
6-27	4500.0	160540	79.7	17	1.5	.05	1.2	0.2	1.1	37	104.5	9.2	0.2	60.8	24.1	24	160	251	399	2.6
8-1	8500.0	160854	81.5	39	2.4	.12	0.7	0.2	4.6	32	108.8	15.2	0.1	61.8	23.7	24	136	252	347	1.7
8-29	4220.0	161136	77.9	28	1.4	.09	1.1	0.5	5.9	43	106.6	12.9	0.1	67.1	22.4	34	152	260	389	1.6
9-26	4260.0	161316	66.2	32	1.1	.09	2.0	0.2	3.2	48	99.6	15.8	0.1	64.2	20.1	38	142	243	386	4.0
11-7	4280.0	161606	50	21	0.5	.11	1.2	0.3	3.9	52	107.8	18.9	0.1	63.0	19.6	47	140	238	406	4.0
11-27	5670.0	161740	44.6	41	2.1	.06	2.0	0.3	6.8	51	109.8	24.0	T	63.0	18.6	52	140	234	432	6.5
1964																				
1-1	4460.0	161952	32	24	1.4	.11	2.4	0.6	5.8	68	112.7	25.4	0.1	66.5	20.3	55	136	250	437	8.0
1-30	3640.0	162114	32	43	2.6	.16	1.8	0.3	7.1	55	103.1	22.4	0.1	64.0	22.4	45	148	252	426	8.0
2-27	4490.0	162349	32	28	1.3	.11	2.0	0.2	6.9	55	115.8	29.8	0.1	65.0	21.8	59	158	252	456	7.5
3-26	10780.0	162507	42.8	34	2.2	.12	1.6	0.2	5.0	69	122.8	24.2	0.1	66.2	23.2	60	146	261	475	6.0
4-30	18070.0	162806	59	67	2.2	.15	1.0	0.1	6.3	30	125.5	27.6	0.0	75.7	25.4	17	136	294	393	1.8
5-20	9540.0	163095	72	67	2.3	.21	1.2	0.2	1.8	47	147.7	8.4	0.0	80.5	26.6	37	164	311	460	1.7
7-2	7920.0	163378	84.4	37	1.9	.16	0.8	0.2	4.0	32	98.7	22.2	0.0	64.1	23.8	20	136	259	346	2.0
7-30	7110.0	163655	80.6	81	2.1	.13	0.8	0.2	6.6	33	95.4	12.3	T	60.1	20.9	35	156	236	371	1.6
8-31	5530.0	164166	78.8	29	0.2	.11	1.3	0.3	3.9	47	99.1	15.4	T	58.8	18.8	51	144	224	378	2.8
9-28	6490.0	164387	60.1	36	2.3	.11	1.3	0.2	6.6	47	90.7	21.8	T	54.9	17.0	48	132	207	375	4.3
10-29	4630.0	164566	57.0	32	1.6	.12	1.2	0.3	2.4	53	116.2	20.4	0.1	63.1	20.8	54	148	243	414	3.7
11-19	5120.0	164723	50.4	31	1.4	.12	1.3	0.2	3.1	55	111.5	22.0	T	61.5	22.3	49	140	245	408	3.6
12-17	6990.0	164920	33.4	38	2.1	.09	1.2	0.3	4.6	51	106.3	16.2	T	62.7	23.7	43	152	254	395	4.9
1965																				
1-14	9680.0	165022	32	84	4.2	.18	0.7	0.3	5.7	38	112.9	22.8	0.1	64.0	22.4	37	144	252	377	2.3
2-18	23690.0	165241	35.6	74	2.9	.06	0.4	0.2	8.7	47	98.9	21.8	0.1	62.4	18.6	39	128	232	383	2.0
3-18	21800.0	165465	38.8	169	10.0	.26	0.5	0.1	9.0	49	119.3	26.2	T	83.2	26.4	38	180	316	473	2.4
4-19	31910.0	165705	52.5	59	3.2	.05	0.4	0.1	8.5	33	115.8	30.2	T	72.0	26.9	27	156	290	417	1.4
5-20	20720.0	166005	70.7	47	2.4	.13	0.6	0.2	7.4	34	125.5	22.6	0.1	74.4	32.7	30	188	320	450	1.4
6-21	3740.0	166400	79.3	80	3.3	.16	0.9	0.2	1.4	44	126.7	20.8	T	76.0	26.9	40	174	300	469	1.9
7-29	3340.0	166795	82.8	24	1.6	.12	0.7	0.3	3.4	45	114.8	23.0	T	65.7	22.5	45	152	256	405	1.8
9-27	23160.0	167264	60.4	35	1.9	.07	0.5	0.3	9.0	28	109.0	15.5	T	72.1	26.8	24	176	290	396	1.4
10-15	7360.0	167400	58.3	40	2.4	.12	0.5	0.3	8.7	34	140.3	17.8	0.1	88.0	30.5	33	208	345	466	1.8
11-1	14110.0	167532	53.2	43	4.0	.13	0.6	0.3	6.8	35	135.8	18.5	T	79.3	30.3	38	200	323	467	2.7
12-3	10070.0	167859	37.6	60	2.9	.20	0.9	0.3	5.0	44	108.8	20.0	T	78.0	28.2	35	196	311	458	2.6

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1966																				
1-3	34030.0	168020	38.8	49	2.4	.15	0.5	0.1	5.9	21	97.9	27.2	T	66.0	24.9	21	160	267	384	0.8
2-3	14450.0	168254	32.5	20	1.3	.12	0.9	0.3	7.7	52	160.7	24.8	T	100.2	36.5	44	236	400	569	2.8
3-4	21890.0	168446	42.1	109	4.5	.24	0.7	0.2	6.1	36	123.2	19.6	T	81.2	31.3	29	200	331	452	2.9
4-4		168656	48.2	72	3.7	.22	0.7	0.2	6.2	40	137.2	11.5	0.0	88.0	31.7	32	212	350	510	1.7
5-5	32770.0	168813	58.1	36	0.6	.10	0.5	0.1	7.0	31	109.4	14.0	T	76.0	26.9	21	176	300	392	0.9
6-6	14020.0	169070	69.8	40	2.1	.12	0.7	0.2	7.6	29	122.8	16.7	T	85.0	31.1	18	196	340	444	1.3
8-2	5770.0	169523	78.8	68	2.9	.23	1.2	0.4	1.4	45	116.6	15.8	T	61.0	24.6	39	140	253	403	1.3
9-1	5750.0	169758	73.4	25	1.1	.14	1.4	0.3	3.2	45	107.2	14.3	0.0	61.0	22.9	37	140	246	377	1.8

KANKAKEE RIVER NEAR WILMINGTON

The Kankakee River rises in Indiana and flows westerly into Illinois in the Kankakee Plain Region. It joins with the Des Plaines River northwest of Wilmington to form the Illinois River. The gaging station is 5 miles downstream from Wilmington, and the elevation of the gage datum is 510.86 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 5250 square miles.

The tabulation of water quality data is for the period from June 5, 1957, to September 26, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were generally higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 11.04 inches above normal to 5.98 inches below normal, based on records for two stations within the drainage basin. The average annual departure was +1.02 inches.

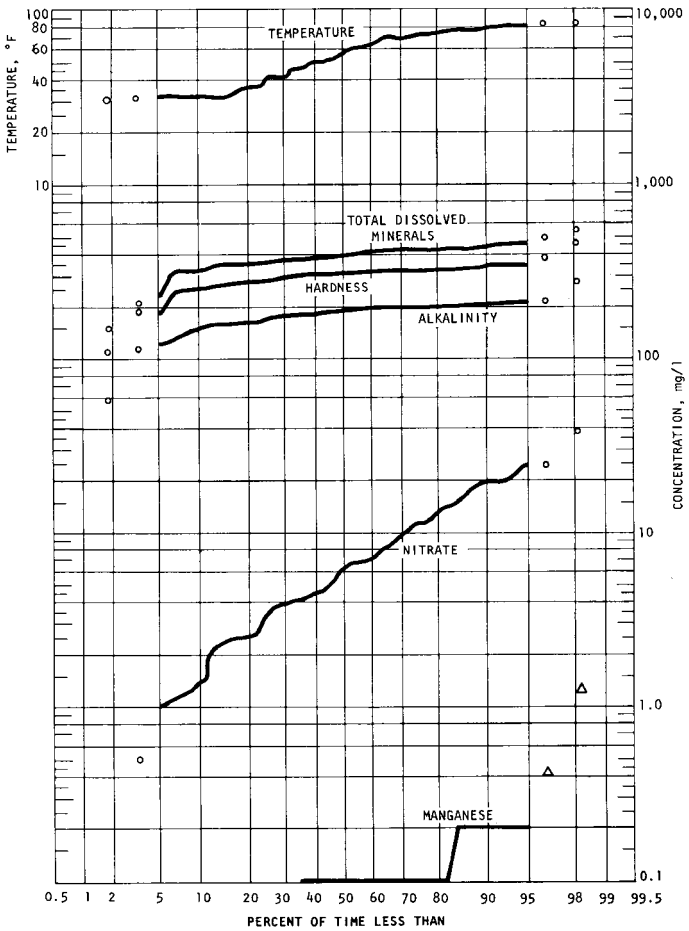
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.8 cfs/sq mi and was not less than 0.18 cfs/sq mi, with a median flow of 0.59 cfs/sq mi. The minimum average daily flow of record was 350 cfs in September 1964.

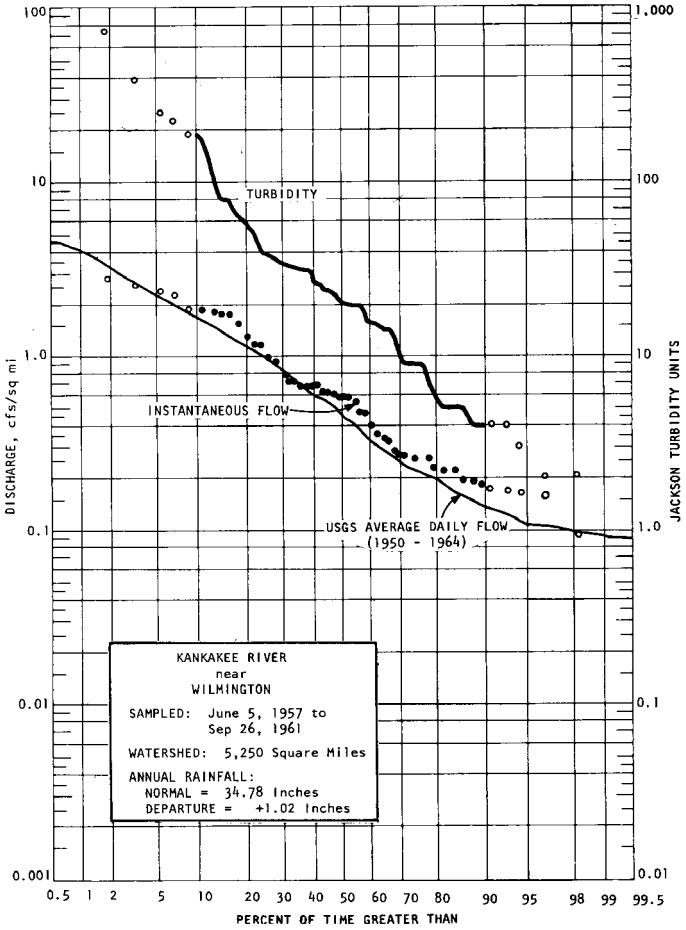
The turbidity was not less than 4 Jtu nor more than 190 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 35 percent of the time. They were below 50 F for 35 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	150	185	210
Hardness (as $CaCO_3$)	255	315	340
Total dissolved minerals	340	390	440
Nitrate	1.3	6.2	18
Manganese	0	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-5	3130.0	143559	73	10	0.7	0.1	0.2	0.2	8.8	14	137.2	12.7	T	86.3	27.2	11	180	328	413	
7-2	12000.0	143772	77	250	4.6	0.2	0.2	0.3	10.4	10	86.2	23.9	0.1	65.0	21.0	9	146	249	339	
8-14	1860.0	144211	77.5	21	0.6	T	0.2	T	1.4	15	129.2	3.1	0.1	71.5	30.3	7	162	304	366	
9-11	920.0	144418	71	24	0.7	T	0.3	0.1	9.3	14	131.9	2.1	T	84.9	28.3	12	196	329	410	
10-17	900.0	144774	59	13	0.7	0.0	0.2	0.0	2.1	12	130.0	T	0.1	80.4	28.4	6	180	318	395	
11-12	1750.0	144989	42	4	0.3	0.0	0.1	0.2	10.7	16	146.5	4.4	0.2	94.0	28.0	9	192	350	429	
12-11	5200.0	145271	32.5	39	0.6	T	0.1	0.1	9.3	19	113.8	9.4	T	80.5	26.0	9	176	309	390	
1958																				
1-14	3600.0	145488	35	3	0.3	0.0	0.3	0.1	7.6	18	165.4	16.1	T	92.0	38.7	14	208	389	490	
2-25	4000.0	145856	33.5	31	2.2	0.1	0.3	0.1	7.5	10	89.5	24.1	0.2	64.4	22.1	6	148	252	325	
3-26	3600.0	146120	48	9	0.7	0.1	0.2	0.1	5.2	15	138.4	5.1	T	85.0	29.6	8	182	334	425	
4-22	2410.0	146372	62	5	0.8	0.1	0.2	0.1	4.3	17	131.1	4.7	0.1	79.5	31.2	11	188	328	407	
5-27	1320.0	146741	72	14	1.1	0.1	0.1	0.1	10.1	14	128.8	2.5	T	81.0	28.9	12	216	322	420	
6-24	9250.0	147690	71	192	10	0.4	0.2	0.1	17.2	12	102.0	11.2	T	82.2	24.7	4	184	307	357	
7-23	6320.0	147275	72	48	2.8	0.1	0.2	0.1	12.6	13	103.2	7.6	T	81.2	28.5	8	204	320	414	
8-13	3020.0	147440	81	22	2.0	0.1	0.1	0.0	11.0	13	91.5	7.2	T	73.0	26.9	7	188	293	372	
9-12	1150.0	147719	71	23	0.6	0.1	0.2	0.1	9.3	14	121.4	2.7	T	82.0	27.3	12	196	317	400	
10-14	956.0	147963	66.5	7	0.3	T	0.3	0.1	6.9	15	120.1	1.3	T	68.0	26.5	13	160	279	359	
11-4	918.0*	148101	52	5	0.3	0.0	0.1	0.1	5.4	17	126.3	1.1	T	83.7	29.3	10	196	330	416	
12-16	2100.0	148492	32.5	400	42	0.2	0.3	0.1	21.0	14	161.8	2.3	T	127.9	28.3	7	280	455	554	
1959																				
1-13	1400.0	148669	33	4	1.5	0.1	0.1	0.0	10.4	19	127.5	3.6	T	92.0	28.7	8	208	348	423	
2-18	15000.0	148884	33	39	2.5	0.2	0.1	0.0	5.0	11	38.7	1.4	0.1	29.8	8.9	2	60	111	152	
3-18	9900.0	149082	42	132	4.2	0.2	0.1	0.1	7.8	18	100.0	3.9	0.1	75.0	25.2	6	172	291	378	
4-22	6280.0	149343	51	15	2.9	0.1	0.1	0.0	5.9	15	115.8	19.3	T	72.1	31.0	17	188	308	389	
5-19	3580.0	149646	71	20	1.3	0.0	0.3	0.1	7.4	20	113.3	6.2	T	80.9	29.2	12	198	322	383	
6-23	1490.0	149931	78	20	0.8	0.2	0.2	0.1	8.0	14	121.6	3.8	T	77.5	29.8	15	200	316	421	
7-29	3230.0	150261	81	34	2.1	0.1	0.3	0.1	11.6	14	114.4	6.0	T	77.4	21.3	10	160	281	372	
8-19	1010.0	150374	84	15	1.0	0.1	0.2	0.1	9.4	14	124.2	4.1	0.3	84.0	25.8	9	184	316	403	
9-18	509.0	150623	65	9	0.5	T	0.2	0.1	9.9	15	123.4	2.4	0.0	83.5	25.5	13	190	314	408	
10-14	3750.0	150800	52.5	31	1.9	0.1	0.2	0.0	11.0	18	133.7	11.8	0.1	84.8	29.4	11	184	333	431	
11-4	3120.0	150948	54	36	2.2	T	0.3	0.1	11.2	13	111.3	6.9	T	80.3	31.4	8	208	330	413	
12-9	3280.0	151176	37	2	0.3	T	0.3	0.0	7.3	15	134.1	7.0	0.0	89.4	30.8	7	200	350	450	0.1
1960																				
1-13	9920.0	151413	45	725	19	1.2	0.2	0.0	6.6	5	57.0	11.2	0.1	45.8	17.9	1	116	188	214	0.1
2-17	9380.0	151695	36.5	80	2.1	T	0.1	0.0	6.9	12	98.9	18.2	T	73.6	24.7	2	156	286	361	0.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
3-22	2850.0	151899	36	24	0.4	0.1	0.3	0.1	5.8	16	118.7	6.5	T	77.6	29.3	11	188	315	379	0.1
4-20	13400.0	152095	54.5	232	5.9	0.1	0.2	0.1	6.9	13	89.3	14.0	0.0	68.8	23.5	9	164	269	325	0.1
5-11	3750.0	152222	47.5	6	0.9	0.0	0.2	0.0	5.5	14	116.6	8.1	T	83.2	29.5	10	204	330	413	0.1
6-14	9920.0	152490	61.5	182	5.9	0.2	0.3	0.1	11.4	14	89.7	36.1	0.1	74.2	26.6	10	176	295	374	0.2
7-12	2450.0	152782	81	32	0.6	0.1	0.2	0.0	8.7	16	116.0	5.7	T	84.0	29.7	16	220	332	403	0.1
8-10	1770.0	152940	77	33	2.7	0.1	0.2	0.2	11.5	15	103.4	8.6	T	75.1	24.8	15	188	290	368	0.4
9-13	4780.0	153221	69.5	16	0.8	T	0.2	0.1	8.6	10	112.1	1.0	T	67.7	34.4	9	200	311	374	0.1
10-7	899.0	153376	62	5	0.3	0.1	0.2	0.1	7.2	10	108.6	0.5	0.1	80.0	25.2	9	196	304	357	0.1
11-15	1390.0	153644	54	2	0.7	0.0	0.2	0.2	4.6	30	125.1	2.5	0.1	83.0	26.6	24	196	317	451	0.1
12-15	1190.0	153826	32	4	0.2	0.1	0.2	0.2	6.4	17	123.6	4.7	T	89.7	28.1	13	212	340	417	0.2
1961																				
1-20	1150.0	154056	33	4	0.3	0.1	0.2	0.1	5.1	17	120.3	4.0	0.1	86.5	22.7	17	196	310	380	0.4
2-16	1000.0	154191	32.5	20	1.4	0.0	0.2	0.1	5.7	20	103.9	6.7	T	67.0	21.8	22	164	257	355	0.5
3-22	8100.0	154447	42.5	33	1.9	0.2	0.2	0.1	8.1	21	125.3	19.8	T	82.8	29.7	12	180	329	440	0.3
4-20	6920.0	154708	49	62	1.6	0.1	0.2	0.1	3.0	31	109.4	17.7	0.1	71.8	23.2	13	132	275	363	0.3
5-24	3580.0	154945	58	9	1.1	0.0	0.2	0.1	6.4	13	122.2	10.0	T	87.7	27.1	9	196	331	394	0.2
6-23	3120.0	155087	71	53	3.3	0.1	0.2	0.1	9.0	12	108.0	14.9	0.1	86.1	25.4	10	200	320	388	0.3
7-13	1440.0	155289	75	14	0.5	0.1	0.2	0.1	4.3	13	109.6	4.2	T	69.8	27.4	8	168	287	344	0.2
8-29	1330.0	155549	78	26	1.2	0.1	0.4	0.1	12.3	11	99.4	3.8	0.1	79.1	23.1	6	184	293	353	0.3
9-26	12500.0	155727		79	3.7	0.1	0.1	0.1	10.6	12	51.4	9.0	T	47.0	16.9	7	124	187	230	0.3

*USGS average daily discharge

KASKASKIA RIVER AT NEW ATHENS

The Kaskaskia River rises west of Champaign in the Bloomington Ridged Plain—South and flows southwesterly into the Springfield Plain Region. The gaging station at New Athens is on the left bank 0.5 mile downstream from the bridge on Illinois Route 13. Elevation of the gage datum is 359.50 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of approximately 5220 square miles.

Tabulations of water quality data are for the two periods from June 18, 1957, to November 13, 1961, and from December 8, 1961, to September 21, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957 to 1961 were generally greater than those indicated by the USGS average daily flow records during 1950-1964, whereas those for the period 1961 to 1966 were generally less than the long-term average daily records. Annual rainfall during the first sample collection period was from 21.62 inches above normal to 8.26 inches below normal, based on records for six stations within the drainage basin. The average annual departure was +2.22 inches. During the second sampling period (1961-1966), annual rainfall was from 5.11 inches above normal to 13.87 inches below normal, based on records for six stations. Average annual departure was —4.22 inches.

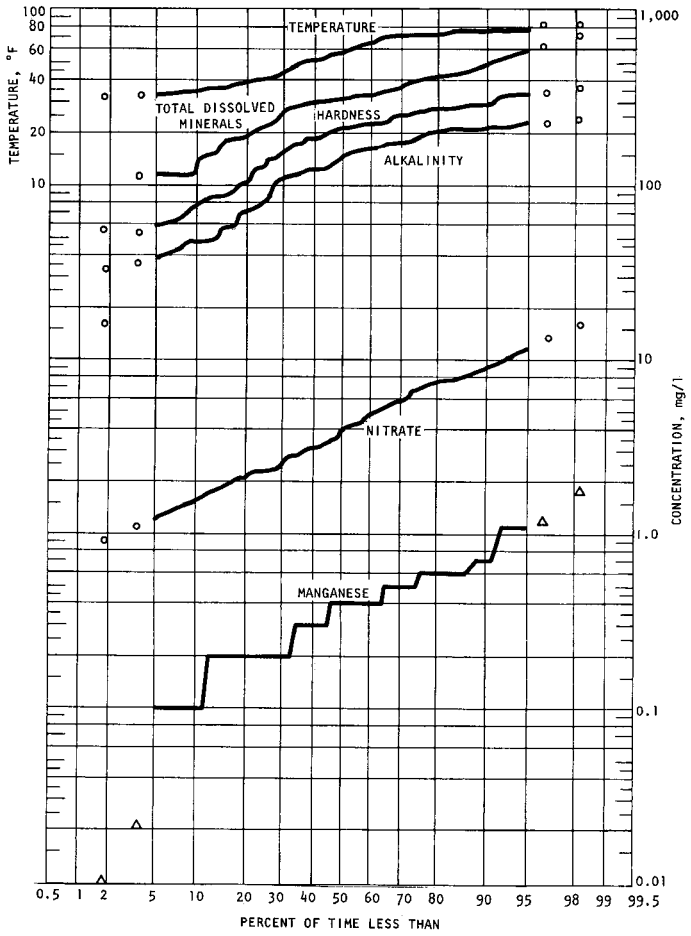
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 2.4 (1957-1961) or 1.47 (1961-1966) cfs/sq mi and was not less than 0.042 (1957-1961) or 0.021 (1961-1966) cfs/sq mi, with a median flow of 0.26 (1957-1961) and 0.11 (1961-1966) cfs/sq mi. The minimum average daily flow of record was 42 cfs in September 1954.

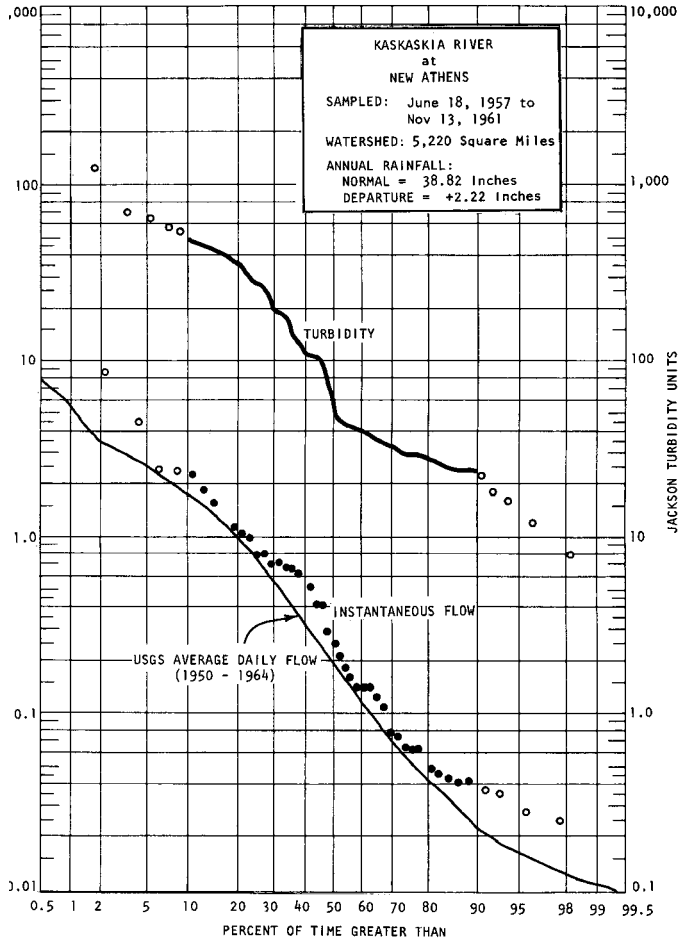
Turbidities for the two sampling periods were not less than 20 Jtu nor more than 550 Jtu (1957-1961) or 190 Jtu (1961-1966) for the central 80 percent of the time. Median values were 60 Jtu (1957-1961) and 45 Jtu (1961-1966).

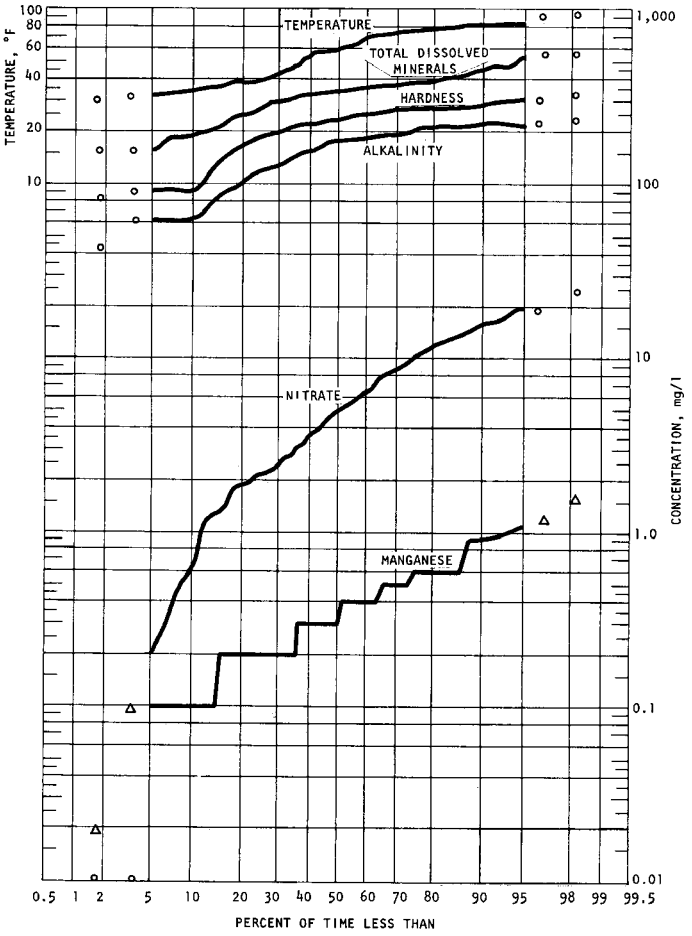
Reported temperatures were over 80 F for 7 (1957-1961) and 5 (1961-1966) percent of the time, and over 70 F for 35 (1957-1961) and 40 (1961-1966) percent of the time. They were below 50 F for 40 (1957-1961) and 35 (1961-1966) percent of the time, and below 40 F for 25 (1957-1961) and 20 (1961-1966) percent of the time.

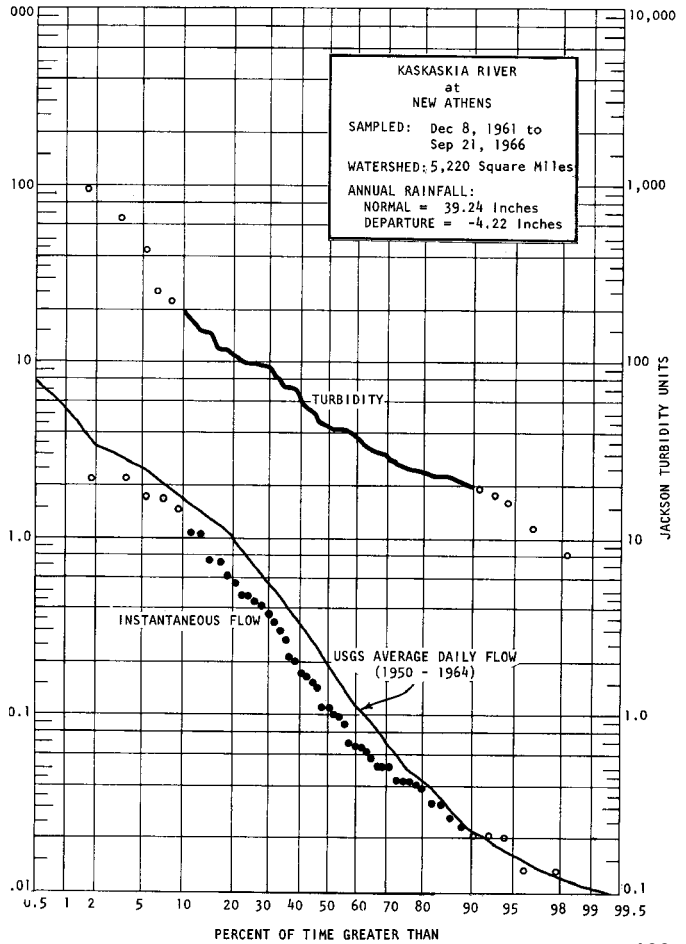
The analyses indicated the following:

		Concentration (*mg / l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1957-1961)	48	135	215
	(1961-1966)	64	176	220
Hardness (as $CaCO_3$)	(1957-1961)	80	220	300
	(1961-1966)	95	235	280
Total dissolved minerals	(1957-1961)	150	320	500
	(1961-1966)	190	340	460
Nitrate	(1957-1961)	1.5	4.3	9.2
	(1961-1966)	0.6	5.0	15.9
Manganese	(1957-1961)	0.1	0.4	0.7
	(1961-1966)	0.1	0.3	0.9


TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


KASKASKIA RIVER
at
NEW ATHENS
SAMPLED: June 18, 1957 to Nov 13, 1961
WATERSHED: 5,220 Square Miles
ANNUAL RAINFALL:
NORMAL = 38.82 Inches
DEPARTURE = +2.22 Inches
TURBIDITY
INSTANTANEOUS FLOW
USGS AVERAGE DAILY FLOW (1950 - 1964)
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN


TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


KASKASKIA RIVER
at
NEW ATHENS
SAMPLED: Dec 8, 1961 to Sep 21, 1966
WATERSHED: 5,220 Square Miles
ANNUAL RAINFALL:
NORMAL = 39.24 Inches
DEPARTURE = -4.22 Inches
TURBIDITY
INSTANTANEOUS FLOW
USGS AVERAGE DAILY FLOW (1950 - 1964)
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-18	44500.0	143632	77.5	460	7.9	0.2	0.2	1.0	3.0	5	8.2	2.3	0.1	8.4	3.2	0	16	34	56	
7-23	10500.0*	144011	82.5	162	3.7	0.2	0.1	T	7.6	8	21.0	2.3	T	23.5	6.6	3	56	86	117	
8-21	834.0	144264	78	47	3.1	1.7	0.2	0.0	10.0	39	50.4	3.2	0.1	55.1	21.1	28	175	225	332	
9-23	327.0	144600	71	39	2.7	0.0	0.2	0.3	8.9	42	41.1	1.8	T	49.0	17.7	28	152	195	304	
10-8	185.0	144714	62	24	1.9	0.5	0.2	0.0	9.7	77	46.9	2.1	T	67.7	24.8	46	212	271	430	
11-12	335.0	145004	45	29	2.0	0.4	0.3	0.1	11.6	60	82.9	2.5	T	64.5	22.8	35	160	256	398	
12-10	560.0	145273	41.5	12	0.7	0.2	0.2	0.1	14.4	65	89.9	3.3	0.1	73.5	39.2	25	212	345	458	
1958																				
1-8	8250.0	145493	32	44	2.3	0.1	0.2	0.0	17.8	24	69.1	9.1	T	48.5	20.2	17	128	204	284	
2-6	2150.0	145664	34	29	2.5	0.2	0.2	0.0	18.8	37	89.1	8.6	T	64.0	26.1	26	172	268	394	
3-19	3470.0	146039	40	131	6.6	0.2	0.2	0.1	12.1	28	86.2	5.6	T	46.0	16.6	27	104	184	301	
4-28	5140.0	146459	57	174	7.0	0.4	0.2	0.1	12.9	27	89.5	2.8	T	42.4	17.8	31	112	179	309	
5-20	3350.0*	146734	71	330	16	0.6	0.2	0.0	11.2	32	90.7	7.9	0.2	68.3	25.7	34	204	277	388	
6-24	5260.0*	146983	72	80	9.8	0.2	0.1	0.0	12.9	20	31.5	7.3	0.1	39.7	11 2	15	112	146	210	
7-23	11700.0	147343	74.5	190	5.0	0.2	0.2	0.0	9.2	11	30.2	0.9	T	17.2	5.2	14	48	64	117	
8-20	9680.0	147544	79	38	2.0	0.3	0.1	0.1	9.5	18	26.9	4.9	T	36.5	14.4	14	124	151	213	
9-17	737.0	147779	71	104	3.0	0.6	0.1	0.0	15.1	116	57.0	2.7	T	74.9	26.1	71	224	295	526	
10-23	398.0	148088	62	33	1.9	0.4	0.1	0.1	10.9	40	53.3	1.4	T	52.9	20.3	23	152	216	321	
11-12	253.0	148248	51	18	1.7	0.6	0.1	0.1	21.4	49	60.1	1.7	T	71.4	28.2	38	244	295	437	
12-9	3460.0	148389	33	40	2.4	0.2	0.1	0.1	11.9	40	75.3	2.3	T	51.6	19.5	26	128	209	337	
1959																				
1-13	725.0	148688	34	8	1.0	0.5	0.1	0.1	11.3	70	113.8	1.3	T	77.6	32.8	46	212	329	496	
2-18	23500.0	148899	38.5	340	11	0.3	0.1	0.0	7.8	11	33.9	1.6	T	17.6	6.8	11	44	72	116	
3-17	7600.0*	149088	44	400	11.6	0.5	0.1	0.0	11.4	24	67.3	6.7	T	45.4	17.9	18	116	187	286	
4-21	6250.0	149379	57	550	11	0.6	0.1	0.0	6.4	51	69.5	5.8	0.3	38.5	11.6	42	88	144	295	
5-19	2800.0*	149681	66	188	9.0	0.7	0.3	0.1	8.3	58	82.6	2.4	T	60.2	25.1	43	176	253	411	
6-23	745.0	149932	76	600	12	0.4	0.1	0.0	9.1	27	55.3	8.3	0.1	58.5	19.9	25	180	228	321	
7-21	212.0	150137	83.5	29	2.9	0.5	0.2	0.1	10.3	28	52.0	1.1	T	60.3	24.8	26	214	253	350	
8-19	4780.0*	150473	76.5	700	15	0.6	0.1	0.1	5.8	43	22.8	3.0	0.1	16.8	4.4	29	36	60	170	
9-16	217.0	150620	70.5	24	1.7	0.2	0.2	0.1	9.9	56	40.1	1.9	0.0	46.8	13.1	36	128	171	277	
10-28	225.0	150896		28	1.5	0.3	0.2	0.1	9.3	38	65.0	3.4	T	47.5	15.6	33	132	183	297	
11-18	3210.0	151009	36	650	20	0.5	0.2	0.0	6.8	29	59.7	5.4	T	30.9	12.3	24	72	128	225	
12-16	3120.0	151231	41	480	11	1.2	0.3	0.0	7.1	33	56.2	4.3	0.1	28.1	8.9	26	56	107	200	0.6
1960																				
1-19	6570.0*	151504	40	270	6.8	0.3	0.2	0.0	9.5	36	65.8	4.2	T	32.2	11.5	33	76	128	242	0.3

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
2-17	5300.0	151722	36	378	9.3	0.2	0.2	0.0	8.4	24	67.5	13.6	T	44.9	16.2	20	108	179	280	0.2
3-16	929.0	151830	37.5	22	1.1	0.3	0.2	0.1	8.4	80	136.6	7.5	T	85.5	34.3	62	228	355	578	0.1
4-4	12800.0	152062	54	120	5.1	T	0.2	0.0	8.3	16	45.0	1.5	T	23.4	7.2	14	48	88	150	0.3
5-7	4100.0	152427	73	265	7.8	0.4	0.2	0.1	20.5	22	55.7	15.6	0.1	75.8	8.9	17	162	226	343	0.8
5-11	2670.0	152258	56.5	366	6.7	0.4	0.2	0.0	10.0	30	76.3	6.8	T	51.0	20.3	26	140	211	314	0.3
7-13	12500.0*	152785	79	16	1.0	0.1	0.2	0.0	7.1	16	34.2	5.2	T	41.5	13.9	13	128	161	219	0.5
8-11	614.0	153029	79	38	2.5	0.2	0.3	0.1	8.4	33	59.9	4.1	T	58.0	16.5	37	180	213	337	0.2
9-15	322.0	153275	71	26	1.9	0.6	0.1	0.1	8.6	28	47.5	3.2	T	55.9	19.7	31	197	221	301	0.2
10-17	130.0	153488	67	36	1.6	0.5	0.2	0.2	7.4	275	50.8	5.8	T	70.0	24.3	159	176	275	716	0.5
11-4	146.0	153595	52	24	2.0	0.7	0.2	0.2	10.4	35	113.1	4.0	T	72.3	23.1	45	204	276	436	0.7
12-8	1100.0	153820	42	102	6.3	0.2	0.1	0.3	7.9	114	90.1	5.1	T	66.7	20.4	79	164	251	485	0.4
1961																				
1-16	230.0*	154057	38	25	1.8	0.4	0.2	0.1	5.7	120	141.9	2.3	T	74.0	37.2	89	212	338	605	0.2
2-14	2190.0	154194	33	230	8.1	1.1	0.3	0.1	4.8	83	104.9	7.4	T	55.1	19.9	61	120	220	421	0.2
3-10	9800.0*	154357	47	440	13	0.3	0.2	0.1	7.1	17	41.1	4.7	0.1	19.2	11.4	11	48	95	150	0.4
4-7	1510.0	154610	52	37	2.1	0.1	0.2	0.1	5.5	46	102.2	10.4	T	70.6	27.6	38	192	290	425	0.2
5-17	49600.0*	154830	60	107	3.8	0.1	0.2	0.0	6.2	7	28.6	3.5	0.1	13.8	4.7	13	40	54	112	0.2
6-16	4120.0	155085	70	1280	25	1.1	0.2	0.0	5.8	17	40.1	7.2	T	27.0	8.9	18	72	104	185	0.6
7-13	384.0	155301	78	41	2.8	0.4	0.3	0.0	1.8	26	64.8	7.4	0.1	65.7	28.6	18	212	282	365	0.4
8-16	3630.0	155525	77	285	6.5	0.4	0.1	0.1	8.9	10	41.1	4.3	0.1	22.6	6.4	21	68	83	184	0.3
9-14	245.0	155698	73	30	2.1	0.6	0.2	0.1	13.6	30	56.6	2.8	T	68.2	23.0	25	216	265	350	0.3
10-16	195.0	155898	64	30	1.3	0.4	0.1	0.1	8.1	29	67.7	2.1	T	58.4	19.7	25	168	227	315	0.2
11-13	1310.0	156149	49	75	3.7	0.2	0.2	0.1	8.5	26	83.1	11.6	T	58.5	21.5	30	168	235	352	0.5
12-8	1100.0	156327	41	30	1.4	0.1	0.3	0.1	10.0	32	83.5	16.5	T	73.5	29.7	26	216	306	405	0.3
1962																				
1-16	8880.0	156493	33	95	3.4	0.2	0.2	0.1	7.9	12	46.9	9.8	T	23.0	8.6	21	64	93	182	0.4
2-8	15500.0	156780	34	39	1.5	T	0.2	0.1	6.1	11	38.7	6.4	T	24.0	8.3	12	60	94	153	0.3
3-9	11100.0	156964	37	70	3.0	0.1	0.2	0.1	7.8	17	56.8	12.5	0.0	40.2	15.0	16	104	162	250	0.2
4-17	2440.0	157294	52	33	1.9	0.1	0.2	0.1	7.5	35	90.3	7.9	T	65.4	26.4	27	182	272	380	0.0
5-14	5540.0	157550	69	440	15	0.9	0.2	0.1	7.1	18	52.7	6.5	0.1	37.0	14.0	16	100	150	250	0.2
6-25	2280.0	157913	76	666	29	1.1	0.3	0.0	8.8	22	44.0	5.0	T	44.0	14.8	16	124	171	248	0.3
7-27	1070.0	158252	77	91	4.6	0.3	0.3	0.1	9.3	21	72.6	8.4	0.1	58.0	18.2	20	152	220	300	0.3
8-20	551.0	158414	80	70	3.4	0.2	0.1	0.1	9.2	21	36.2	5.7	T	49.4	23.5	2	152	220	252	0.3
9-17	318.0	158604	74	42	2.8	0.3	0.3	0.1	6.7	68	38.7	0.3	T	51.3	17.4	42	156	200	323	0.1
10-15	455.0	158816	71	71	3.6	0.3	0.1	0.0	8.1	31	53.7	4.7	0.1	47.3	15.4	28	140	182	269	0.3
11-12	196.0	159008	51	26	1.7	0.6	0.1	0.1	11.0	48	71.4	3.1	0.1	69.6	24.6	40	212	275	401	0.1
12-17	162.0	159204	34	25	2.4	0.6	0.1	0.1	9.3	57	92.6	1.5	0.1	77.2	27.5	48	232	306	475	0.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1963																				
1-14	267.0	159363	33	12	0.8	0.1	0.2	0.1	4.0	118	115.8	5.1	0.1	71.8	24.9	85	176	282	556	0.1
2-13	210.0	159549	32	8	1.3	0.6	0.2	0.1	7.7	98	119.7	3.8	0.1	82.9	30.2	78	236	332	570	0.3
3-14	7670.0	159765	46	223	6.0	0.3	0.1	0.0	8.0	19	49.2	13.1	0.4	27.4	8.1	14	44	102	192	0.5
4-8	2860.0	159945	58	23	1.9	1.0	0.4	0.2	7.5	63	75.9	4.9	0.3	58.9	21.3	9	84	235	330	0.1
5-14	779.0	160216	71	18	3.5	.13	0.2	0.2	2.9	32	71.4	10.3	0.4	61.3	26.3	29	196	261	372	0.0
6-10	830.0	160383	84	117	5.5	.44	0.2	0.1	5.1	34	54.1	3.5	0.1	52.8	20.7	32	180	217	327	0.3
7-24	915.0*	160795	81	257	7.9	.43	0.2	0.1	5.8	18	30.9	5.4	0.1	25.2	6.8	16	64	91	159	0.3
8-13	294.0	160990	79	43	2.3	.57	0.2	0.1	6.0	34	77.5	0.6	T	65.0	27.6	23	196	276	360	0.5
9-16	228.0	161223	73	36	1.8	.40	0.3	0.1	7.1	25	56.0	1.1	0.1	62.0	23.8	17	196	253	314	0.2
10-14	105.0	161422	62	24	1.4	.57	0.1	0.2	8.2	27	51.2	2.3	T	64.3	27.5	15	212	274	338	0.4
11-11	108.0	161630	52	23	1.1	.51	0.3	0.2	7.8	36	61.5	0.2	T	70.0	23.3	37	236	271	368	0.1
12-9	135.0	161797	39	16	1.7	.45	0.2	0.1	7.6	80	81.0	1.9	0.1	66.1	25.2	66	214	269	460	0.3
1964																				
1-14	90.0*	162018	32	24	3.7	.87	0.2	0.2	5.1	58	100.6	2.7	0.1	74.0	26.8	52	220	295	450	0.7
2-10	512.0	162232	36	96	5.9	.22	0.2	0.1	7.0	53	94.2	15.9	T	51.3	15.9	42	100	194	343	0.7
3-10	6700.0*	162415	44	958	41	1.60	0.2	0.1	5.5	30	43.6	8.0	T	23.8	8.4	30	64	94	200	0.4
4-13	8530.0	162680	58	145	6.1	.25	0.2	0.1	9.5	16	48.8	6.5	T	30.6	11.8	19	88	125	215	0.1
5-11	3140.0	162872	70	105	6.7	.46	0.2	0.1	6.8	30	60.1	8.6	T	58.7	21.4	17	164	235	297	0.3
6-8	552.0	163133	74	79	3.8	.60	0.2	0.0	4.1	43	73.8	2.2	0.1	66.7	25.8	27	192	273	361	0.3
7-27	226.0	163619	93	32	1.6	.32	0.1	0.0	5.5	30	52.7	1.3	0.1	58.0	19.1	33	196	223	327	0.3
8-17	118.0	163732	75	19	1.2	.52	0.2	0.1	9.7	28	52.0	0.5	0.1	65.6	25.0	28	234	266	365	0.5
9-9	109.0	164219	83	23	1.3	.57	0.2	0.0	0.9	33	61.7	2.1	T	58.8	26.6	24	196	256	327	0.2
10-12	68.1	164453	59	27	1.1	.54	0.1	0.0	7.1	45	50.2	2.1	T	63.4	21.4	40	216	245	367	0.2
11-16	67.0	164681	60	45	2.5	.91	0.2	0.1	9.2	25	59.7	1.3	T	63.3	22.4	30	216	250	379	0.2
12-14	166.0	164828	38	44	2.4	.34	0.1	0.2	7.5	120	104.9	1.8	T	60.1	19.1	84	132	229	485	0.4
1965																				
1-11	266.0	164999	39	21	1.0	.36	0.2	0.1	6.6	128	118.5	3.1	0.4	69.5	21.4	92	156	261	530	0.2
2-10	1910.0	165169	39	51	4.0	.11	0.3	0.2	7.3	44	85.0	19.7	0.1	57.5	14.0	36	112	201	349	0.4
3-15	1350.0	165430	43	81	5.0	.17	0.2	0.0	7.7	47	84.1	12.4	0.1	49.6	18.2	38	118	199	339	0.2
4-12	2410.0	165678	62	115	4.8	.23	0.3	0.3	6.4	47	93.6	19.3	0.1	56.4	22.5	38	136	233	379	0.6
5-12	2190.0	165935	70	102	5.5	.38	0.3	0.4	7.2	41	81.0	16.0	0.2	62.4	25.4	33	176	260	386	0.2
6-14	3790.0	166277	75	161	8.1	.46	0.3	0.0	9.1	20	44.4	24.2	0.1	52.0	19.1	14	146	208	271	0.3
7-27	338.0	166806	80	56	4.4	.31	0.2	0.1	4.2	36	56.8	0.0	T	55.9	19.6	28	172	220	322	0.6
8-16	224.0	166987	90	49	3.1	.42	0.2	0.1	6.9	48	54.3	3.6	0.0	55.8	22.0	39	188	229	351	0.5
9-14	738.0*	167214	73	99	9.6	.22	0.1	0.1	6.6	23	23.9	4.0	0.0	22.0	7.1	22	68	84	159	0.4
10-15	997.0*	167377	59	43	5.3	.14	0.2	0.1	5.7	53	53.3	8.5	T	56.9	20.6	38	172	227	355	0.7

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1965																				
11-8	354.0	167549	60	36	2.3	.22	0.2	0.2	6.8	42	60.3	6.0	0.1	60.0	29.3	33	216	270	382	0.5
12-13	265.0	167872	46	29	2.1	.39	0.2	0.2	5.1	64	58.0	4.4	0.1	66.0	27.1	46	226	276	419	0.3
1966																				
1-12	2300.0	168127	36	45	2.2	.23	0.2	0.2	8.9	38	64.8	13.4	0.1	58.0	24.0	29	174	243	360	0.3
2-18	11200.0	168298	40	53	2.3	.17	0.2	0.1	8.9	17	46.3	11.0	0.1	24.0	8.3	22	60	94	186	0.5
3-10	3790.0	168503	40	193	7.3	.20	0.3	0.0	8.4	31	62.1	10.4	0.1	43.0	18.4	27	124	183	292	0.5
4-12	913.0	168759	49	25	1.4	.24	0.1	0.1	1.4	53	85.0	2.8	T	61.0	30.6	39	196	278	404	0.1
5-12	5430.0	169038	58	43	2.2	.22	0.1	0.1	1.6	33	62.1	8.3	0.1	62.0	22.0	26	184	245	339	0.3
6-8	1730.0	169167	71	99	4.0	.35	0.3	0.1	7.8	29	57.8	14.4	0.0	73.0	27.0	18	220	293	378	0.3
7-20	348.0	169498	82	20	1.0	.22	0.3	0.1	0.4	27	55.5	0.0	0.0	53.0	23.7	19	176	230	291	0.5
8-18	667.0	169692	82	31	1.5	.26	0.3	0.1	6.1	31	44.6	1.8	0.0	53.0	21.3	22	176	220	307	0.5
9-21	539.0	169929	64	145	6.6	1.23	0.1	0.1	7.4	21	34.4	2.3	0.1	37.6	12.6	17	116	146	209	0.5

*USGS average daily discharge

KASKASKIA RIVER AT SHELBYVILLE

The Kaskaskia River rises in the Bloomington Ridged Plain—South, west of Champaign, and flows southwesterly through the Springfield Plain Region to its junction with the Mississippi River below New Athens. The gaging station at Shelbyville is located 50 feet upstream from the bridge on Illinois Route 16. Elevation of the gage datum is 535.78 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of approximately 1030 square miles.

Tabulations of water quality data are for the two sampling periods from August 21, 1956, to November 15, 1961, and from December 6, 1961, to September 13, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for both periods were generally very similar and generally lower than those indicated by the USGS average daily duration curve. Annual rainfall was from 14.87 inches above normal to 8.26 below normal during the first period (1956-1961), and from 1.44 inches above normal to 11.81 inches below normal during the second period (1961-1966), based on records for one station within the drainage basin. The average annual departures were +0.68 inch (1956-1961) and —6.35 inches (1961-1966).

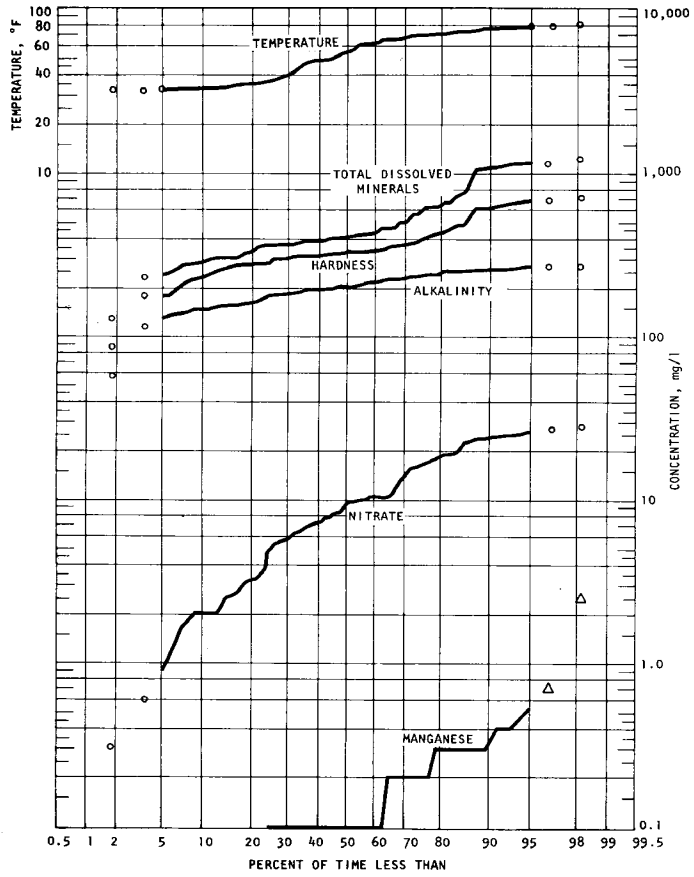
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flows did not exceed 1.4 cfs/sq mi (1956-1961 and 1961-1966), and were not less than 0.014 cfs/sq mi (1956-1961) or 0.0055 cfs/sq mi (1961-1966). Median flows were 0.14 cfs/sq mi (1956-1961) and 0.13 cfs/sq mi (1961-1966).

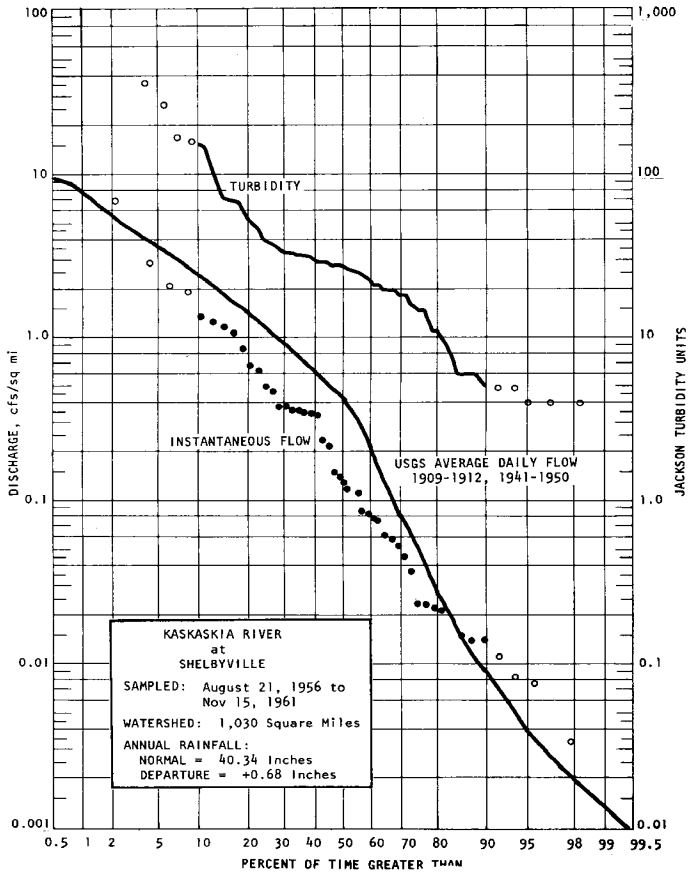
Turbidities for the two sampling periods were not less than 5 Jtu (1956-1961 and 1961-1966), nor more than 150 Jtu (1956-1961) or 190 Jtu (1961-1966), with median values of 25 Jtu for both periods.

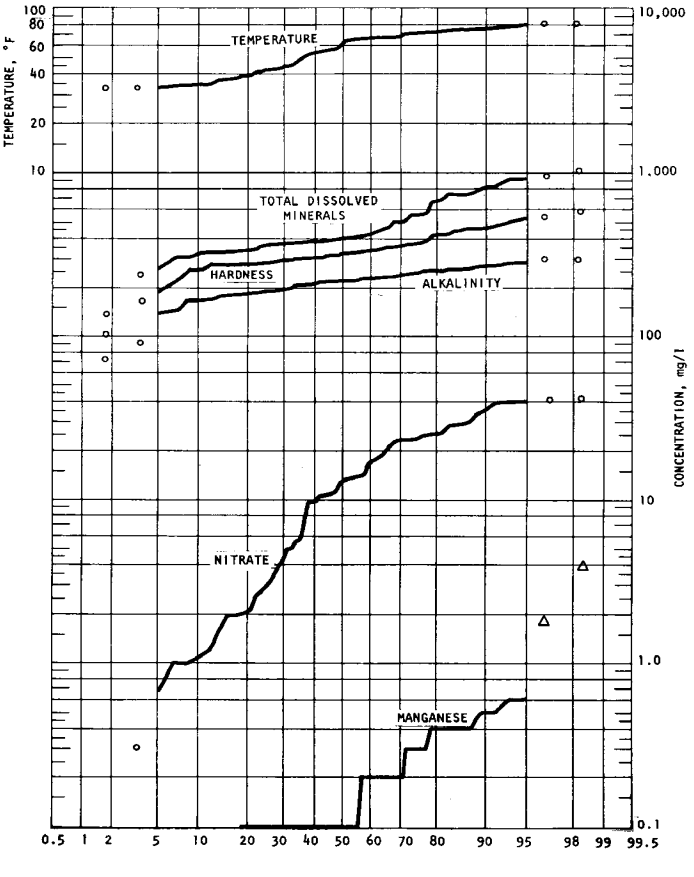
The reported temperatures were over 80 F for 2 (1956-1961) and 3 (1961-1966) percent of the time, and over 70 F for 27 (1956-1961) and 25 (1961-1966) percent of the time. They were below 50 F for 39 (1956-1961) and 37 (1961-1966) percent of the time, and below 40 F for 29 (1956-1961) and 20 (1961-1966) percent of the time.

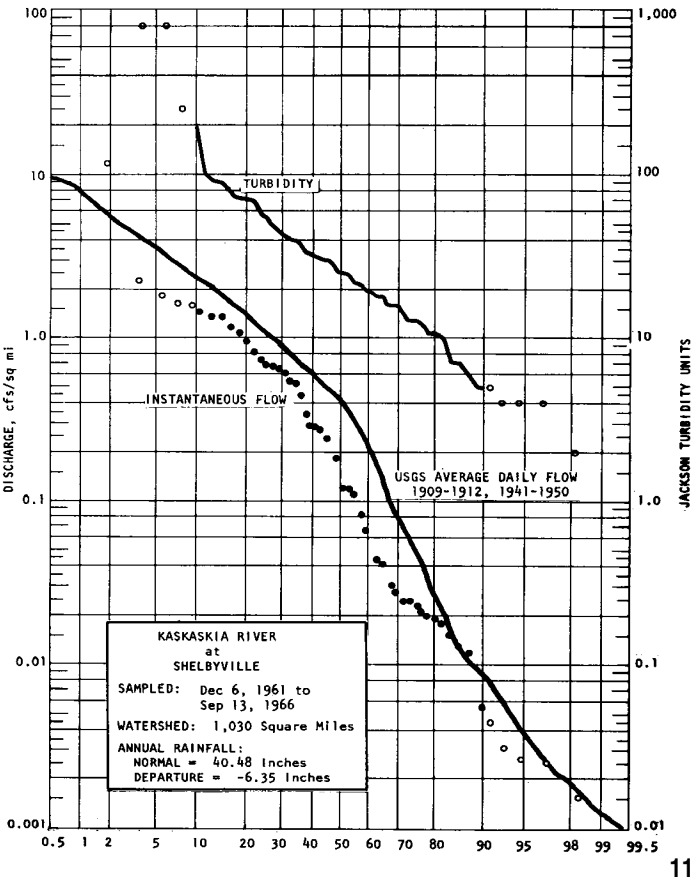
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1956-1961)	80	200	260
	(1961-1966)	170	215	270
Hardness (as $CaCO_3$)	(1956-1961)	110	320	620
	(1961-1966)	260	325	470
Total dissolved minerals	(1956-1961)	160	400	1050
	(1961-1966)	330	405	815
Nitrate	(1956-1961)	0.45	8.2	23.0
	(1961-1966)	1.1	12.9	34.9
Manganese	(1956-1961)	0	0.1	0.3
	(1961-1966)	T	0.1	0.5


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
PERCENT OF TIME LESS THAN


DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
TURBIDITY
INSTANTANEOUS FLOW
USGS AVERAGE DAILY FLOW 1909-1912, 1941-1950
KASKASKIA RIVER at SHELBYVILLE
SAMPLED: August 21, 1956 to Nov 15, 1961
WATERSHED: 1,030 Square Miles
ANNUAL RAINFALL:
NORMAL = 40.34 Inches
DEPARTURE = +0.68 Inches
PERCENT OF TIME GREATER THAN


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE


DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
TURBIDITY
INSTANTANEOUS FLOW
USGS AVERAGE DAILY FLOW 1909-1912, 1941-1950
KASKASKIA RIVER at SHELBYVILLE
SAMPLED: Dec 6, 1961 to Sep 13, 1966
WATERSHED: 1,030 Square Miles
ANNUAL RAINFALL:
NORMAL = 40.48 Inches
DEPARTURE = -6.35 Inches

Date	Instantaneous discharge Cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
8-21	118.0	141301	70.5	33	2.1	0.2	0.1	0.0	9.8	24	76.5	5.4	T	72.9	27.5	16	212	296	361	
11-28	21.9	141981	35	4	0.4	0.1	0.2	0.6	10.0	158	474.3	0.3	0.1	209.3	40.1	107	204	688	1176	
12-28	213.0	142208	38.5		0.3	0.1	0.3	0.1	8.7	60	117.9	15.8	0.4	94.0	32.4	36	228	368	501	
1957																				
2-15	1090.0*	142655	39.7	47	1.7	0.2	0.3	T	8.7	20	74.1	18.5	0.1	72.6	22.5	12	180	274	337	
3-18	404.0*	142886	49	14	1.0	T	0.2	0.0	4.8	27	70.8	19.0	T	74.8	28.6	15	210	305	372	
5-28	2580.0*	143471	62.8	32	1.3	0.1	0.3	T	9.0	15	58.6	24.8	T	66.6	27.4	40	186	279	308	
8-13	105.0*	144229	79.4	19	0.5	0.0	0.3	0.1	13.6	24	73.2	7.0	T	82.0	31.6	17	256	335	424	
9-12	37.6	144524	70	28	2.0	0.2	0.2	0.3	8.2	44	86.7	2.5	T	74.8	27.7	26	204	301	407	
11-15	137.0	145000	47.5	72	3.5	0.1	0.3	0.1	8.4	46	122.8	3.8	T	79.5	27.0	32	184	310	444	
12-16	241.0	145270	32.2	5	0.3	0.0	0.3	0.2	9.0	33	108.4	6.4	0.2	86.5	33.1	24	240	352	466	
1958																				
2-27	370.0	145853	36.5	1600	30	0.7	0.3	0.1	5.3	18	55.7	9.8	T	77.0	26.2	5	220	300	356	
3-28	1110.0	146118	43.5	22	1.4	0.1	0.2	0.0	7.6	21	79.2	9.1	0.1	76.0	30.9	1	200	317	360	
4-25	489.0	146422	52.5	19	1.1	0.1	0.3	0.1	4.3	29	79.2	8.4	T	74.2	33.3	9	212	322	375	
5-29	260.0*	146748	67	44	3.2	0.1	0.2	0.1	9.2	23	83.5	8.2	T	78.4	30.1	16	228	319	393	
6-17	7100.0	146869	70.5	196	4.3	0.0	0.1	0.1	28.4	8	29.8	7.7	T	43.6	16.7	1	136	178	244	
7-23	3000.0	147245	69.3	55	2.4	T	0.3	0.0	12.0	15	44.0	6.9	0.1	66.4	25.4	6	212	271	308	
9-26	87.2	147778	72.5	42	1.2	0.1	0.3	0.0	10.9	33	111.5	5.5	T	91.5	33.8	25	256	368	466	
10-16	120.0	147959	61.8	25	1.5	0.1	0.2	0.1	10.3	25	72.6	7.3	T	77.5	29.7	17	236	316	388	
11-6	59.8	148100	49.5	6	1.0	0.1	0.2	0.1	6.3	38	141.1	7.6	T	98.1	25.7	55	264	351	557	
12-30	220.0*	148558	33	4	0.5	0.1	0.3	0.0	7.9	23	102.2	6.2	T	90.7	29.4	14	240	349	431	
1959																				
1-12	147.0	148612	33.2	7	0.2	0.3	0.3	0.1	9.3	33	186.2	3.3	T	114.3	37.0	33	268	430	620	
2-13	10900.0*	148820	37	11	15	0.4	0.1	0.1	12.5	8	22.0	1.0	0.2	24.0	6.7	2	56	88	132	
3-13	1950.0	149059	40.2	800	14	0.3	0.1	0.0	7.7	12	46.7	14.5	T	53.8	21.0	4	152	222	273	
4-7	713.0	149259	56.8	13	0.8	0.1	0.1	0.0	11.0	13	50.8	10.4	0.1	44.1	16.2	9	116	177	232	
5-22	393.0	149680	69.2	55	2.6	0.1	0.1	0.1	10.4	20	74.7	10	T	79.2	30.2	10	230	322	385	
6-30	86.6	149949	76	31	1.6	0.1	0.3	0.1	9.9	21	67.9	5.8	T	82.1	31.5	14	260	335	411	
7-23	22.7	150136	79	18	1.5	0.3	0.3	0.1	4.3	40	174.8	0.6	T	94.6	40.5	31	232	403	563	
8-20	55.0	150376	81.2	39	2.0	0.2	0.4	0.1	13.8	38	135.4	1.6	T	76.0	24.8	36	174	292	457	
9-23	3.5	150675	71.2	11	0.3	0.4	0.5	0.3	3.1	79	532.6	2.0	0.1	183.6	39.2	89	148	620	1101	
10-23	15.6	150827	54	30	1.3	0.1	0.5	0.2	7.8	89	237.6	7.3	0.1	107.4	22.3	80	156	360	662	
11-20	150.0	151012	33.2	16	1.1	0.0	0.7	0.2	8.8	92	244.2	11.9	T	117.7	30.3	55	144	417	683	
12-11	47.8	151175	33.2	10	0.5	T	0.4	0.1	6.1	81	171.3	4.9	0.0	113.9	36.2	53	252	434	643	

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
1-29	353.0	151550	32	250	5.1	0.3	0.2	0.0	6.8	25	95.4	10.4	0.1	70.2	26.9	19	184	286	389	0.4
2-19	643.0	151721	32.8	22	0.6	0.1	0.2	0.1	7.6	24	92.6	10.9	T	81.0	31.1	12	216	331	409	0.2
3-25	360.0	151912	33.7	18	0.5	0.1	0.3	0.0	4.4	36	96.3	9.9	0.1	79.0	31.1	15	200	326	405	0.2
4-21	1200.0	152176	60.2	70	2.2	T	0.2	0.0	5.9	23	79.8	22.6	T	72.0	29.5	11	192	302	390	0.4
5-23	873.0	152279	66	74	3.9	0.2	0.3	0.0	10.3	18	72.0	23.6	T	73.6	29.4	9	204	305	372	0.4
6-13	904.0*	152426	70.3	800	15	0.3	0.2	0.1	18.9	15	60.3	25.2	T	68.0	25.8	11	196	276	363	0.4
7-13	500.0	152748	75	39	2.0	0.1	0.4	0.1	10.7	21	58.6	27.9	T	82.7	30.4	18	252	332	413	0.4
8-10	64.1	152938	79	24	1.1	T	0.3	0.1	7.8	29	119.7	10.0	T	94.0	33.8	27	260	375	501	0.4
9-20	11.1	153259	68	12	0.6	0.2	0.2	0.2	5.4	59	276.3	2.0	0.1	129.6	37.7	54	224	479	715	0.3
10-18	7.7	153487	62	13	0.8	0.2	0.3	0.5	6.2	75	560.3	2.0	T	203.6	43.5	95	204	688	1163	0.2
11-15	14.9	153628	50.5	2	0.4	0.0	0.7	0.5	7.8	72	490.6	2.6	T	188.8	37.2	85	196	625	1056	0.5
12-14	23.7	153794	36	4	0.4	0.1	0.5	0.7	6.3	79	507.5	17.6	T	208.4	33.8	87	196	660	1099	0.9
1961																				
1-11	23.2	153960	36	5	0.4	0.0	0.5	0.5	2.6	95	613.6	15.9	T	236.8	28.9	115	176	711	1257	1.0
2-15	80.4	154174	35	16	0.8	2.5	0.6	0.4	8.0	60	558.9	10.4	T	192.8	37.9	90	160	638	1083	0.3
3-15	1370.0	154335	46.5	90	3.5	0.3	0.2	0.1	6.9	23	65.8	26.2	T	63.3	22.7	14	160	252	327	0.3
4-19	388.0	154709	50	7	0.2	0.0	0.2	0.1	1.8	9	99.1	18.9	T	80.0	29.4	12	216	321	380	0.1
5-18	2140.0	154831	62.5	71	3.5	0.1	0.4	0.1	9.0	13	55.5	23.1	T	63.4	24.9	5	176	261	291	0.3
6-14	1270.0	155039	75	89	4.4	0.1	0.2	0.1	8.0	9	49.8	24.1	0.1	59.9	19.9	7	164	232	287	0.4
7-12	77.8	155287	72	16	0.8	T	0.3	0.1	6.8	2	83.5	16.1	0.2	84.2	32.7	10	238	345	401	0.4
8-8	366.0	155433	78	100	3.6	0.2	0.1	0.2	8.9	28	57.0	13.2	0.1	53.8	18.8	21	148	212	306	0.5
9-13	8.7	155625	78	25	1.1	0.6	0.2	0.1	4.1	47	207.3	3.2	0.1	119.0	38.3	37	252	455	620	0.3
10-19	14.5	155922	55	30	1.0	0.3	0.2	0.2	1.1	50	368.2	3.0	T	144.0	32.6	54	156	494	785	0.1
11-15	337.0	156144	50	38	1.4	0.1	0.2	0.1	10.2	26	102.4	17.0	T	93.8	31.7	15	240	365	445	0.3
12-6	454.0	156273	43.5	16	0.6	T	0.2	0.1	8.1	25	89.7	18.2	T	89.6	33.3	16	252	361	445	0.3
1962																				
1-25		156556	33	5	0.4	0.0	0.3	0.1	6.6	24	64.4	24.9	0.3	75.6	30.9	9	216	316	381	0.2
2-14	1370.0	156776	40	32	1.3	0.1	0.2	0.1	6.9	16	63.4	21.4	T	68.0	27.2	5	188	282	350	0.3
3-22	12200.0	157029	43.5	1300	36	0.5	0.2	0.1	6.2	5	24.9	13.9	T	26.8	8.3	7	72	101	136	0.3
4-18	551.0	157281	54	8	0.6	0.1	0.3	0.1	3.3	19	117.2	28.0	T	86.0	31.1	15	204	343	420	0.2
5-9	686.0	157461	66	29	1.4	0.1	0.1	0.1	6.1	16	52.0	22.8	T	71.2	26.0	7	206	285	349	0.2
6-13	1090.0	157795	68	155	6.0	0.3	0.1	0.1	9.4	13	50.4	23.7	T	62.9	24.6	7	184	258	306	0.3
7-19	729.0	158178	75	143	6.4	0.3	0.3	0.1	9.6	16	78.6	13.5	0.1	67.0	20.6	14	168	252	341	0.4
8-15	184.0	158376	72	21	0.8	T	0.3	0.1	9.2	20	68.9	5.7	0.1	87.0	27.8	15	254	332	410	0.2
9-12	47.5	158546	73	28	0.6	0.1	0.3	0.3	5.1	27	59.9	1.0	0.1	80.0	30.9	21	272	327	395	0.2
10-10	20.4	158770	67	15	0.7	0.1	0.2	0.1	4.2	32	163.3	0.3	0.1	97.5	24.8	35	208	346	504	0.1
11-6	24.0	158980	45	6	0.5	0.2	0.3	0.3	7.5	72	245.0	3.0	0.1	130.0	31.9	66	240	456	740	0.6
12-4	32.3	159117	45	11	1.0	0.2	0.3	0.3	5.3	70	330.4	2.1	0.1	144.2	30.8	77	212	487	830	0.3

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1963																				
1-9	25.9	159317	38	5	0.3	0.1	0.4	0.6	4.4	66	354.4	3.5	0.1	154.4	30.2	97	256	510	909	0.5
2-5	15.8	159468	34	28	0.4	4.0	0.5	0.2	5.8	92	329.1	5 0	0.1	154.2	36.4	111	300	535	952	0.3
3-11	2290.0	159730	42	69	3.5	0.1	0.2	0.1	8.4	13	56.6	25.3	0.1	43.5	13.4	12	92	164	232	0.7
4-4	1630.0	159899	58	33	1.7	0.1	0.2	0.0	6.6	20	61.9	23.3	0.1	68.1	24.9	14	192	273	338	0.3
5-15	205.0	160211	68	4	0.3	0.1	0.3	0.1	4.3	29	57.2	13.7	0.1	69.8	30.0	21	232	298	370	1.2
6-12	355.0	160388	71	358	11	.39	0.2	0.2	7.7	16	44.0	17.8	0.1	53.4	20.6	15	168	218	304	0.4
7-17	297.0	160661	77	70	3.5	.09	0.1	0.1	8.9	18	41 8	10.3	0.1	51.2	17.5	11	148	200	264	0.4
8-9	28.8	160977	82	24	1.2	.38	0.3	0.1	3.5	28	41.3	1.9	T	66.7	26.4	21	236	275	338	0.3
9-11	43.6	161159	71	21	1.1	.16	0.3	0.3	4.5	27	63.1	1.1	0.1	60.7	33.3	15	218	289	341	0.1
10-23	13.7	161405	65	71	1.2	.57	0.4	0.2	5.1	62	137.0	1.6	T	92.0	34.2	58	272	378	555	0.5
11-13	4.7	161621	45	20	1.0	.37	0.3	0.3	5.5	61	200.6	1.9	0.1	108.0	36.5	64	266	420	651	0.8
12-11	21.5	161822	34	4	0.3	.05	0.2	0.5	4.4	71	333.0	5.5	0.1	130.2	35.1	83	200	470	816	0.4
1964																				
1-8	18.4	161987	34.5	6	0.4	.22	0.4	0.6	2.8	89	401.3	14.0	3.6	166.0	42.1	116	296	588	1037	0.8
2-12	125.0	162235	33	4	0.2	.08	0.2	0.1	6.5	72	85.8	16.5	T	82.7	32.1	39	220	339	505	0.5
3-4	287.0	162361	46	9	0.6	.15	0.2	0.1	2.2	43	90.0	10.7	T	76.0	29.2	30	212	310	420	0.1
4-13	1820.0	162644	56	32	2.0	11	0.3	0.1	7.9	22	57.8	28.9	T	69.0	25.4	15	194	277	330	0.1
5-12	552.0	162869	65	33	1.9	.02	0.2	0.1	5.2	17	61.9	25.4	T	75.2	29.4	6	212	309	337	0.2
6-10	129.0	163135	80	22	1.2	.10	0.3	0.1	5.0	29	69.7	13.6	T	76.2	30.4	12	216	316	365	0.3
7-17	42.3	163556	78	25	1.1	.02	0.1	0.1	3.1	27	50.8	3.8	T	70.0	29.3	27	260	295	375	0.6
8-18	2.8	163728	75	26	0.8	.51	0.3	0.1	2.6	50	175.1	0.7	T	93.8	33.1	57	240	370	560	0.2
9-15	2.7	164243	68	20	1.1	.57	0.1	0.1	4.8	84	281.8	2.6	T	86.0	56.3	80	208	446	739	0.2
10-13	3.3	164448	53	20	0.9	.20	0.1	0.4	2.0	41	355.9	2.0	T	116.0	33.7	89	192	428	765	0.3
11-10	1.6	164628	55	46	2.4	1.27	0.4	0.4	4.0	51	427.4	1.16	0.2	132.4	51.7	89	220	543	920	0.2
12-16	19.4	164871	37	23	0.9	.23	0.3	0.4	5.5	100	236.3	9.3	T	107.7	23.7	92	172	366	686	0.4
1965																				
1-13	128.0	164990	33	11	0.6	.02	0.4	0.2	8.5	60	220.5	19.7	T	112.4	27.8	35	140	395	587	0.7
2-16	696.0	165229	38	168	2.9	.02	0.3	0.2	7.6	31	92.8	40.0	T	74.8	25.7	22	168	292	391	0.3
3-18	664.0	165422	42	29	1.8	.07	0.3	0.1	3.9	28	67.7	34.9	T	64.8	30.5	14	180	287	380	0.2
4-14	1450.0	165667	52	48	4.3	.10	0.3	0.1	7.8	22	63.4	42.0	T	68.8	26.4	14	178	280	371	0.6
5-7	960.0	165897	68	39	2.5	.16	0.3	0.1	6.1	23	59.7	41.6	T	68.0	30.8	13	196	296	386	0.4
6-18	486.0*	166285	68	25	1.5	.09	0.3	0.1	8.8	22	56.0	40.4	T	79.2	31.0	10	224	325	406	0.2
7-8	250.0	166553	76	37	1.5	.10	0.1	0.1	7.5	24	93.6	2.7	T	68.2	26.5	14	176	279	383	0.3
8-18	19.0*	167022	79	36	1.3	.39	0.3	0.1	5.1	38	71.8	10.9	0.1	70.4	30.8	36	244	302	408	0.2
9-14	55.0*	167235	74	34	1.9	.08	0.3	0.2	6.8	34	71.4	8.0	T	72.8	30.8	26	236	308	414	0.3
10-8	633.0	167342	57	28	1.7	.11	0.3	0.1	9.6	21	61.9	23.8	0.0	77.6	34.7	15	256	336	399	0.5
11-10	122.0*	167558	50	6	0.3	.00	0.4	0.1	3.3	30	83.1	9.6	T	84.8	38.1	26	288	368	463	0.6
12-8	85.0*	167789	36	5	0.2	.00	0.3	0.0	1.1	44	166.6	10.3	0.0	102.4	42.0	35	260	428	559	2.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^{0}F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1966																				
1-10	824.0	168100	35	15	0.6	·13	0.3	0.1	8.8	27	66.7	28.7	0.1	77.0	36.0	16	244	340	435	0.4
2-15	1380.0	168346	39	29	1.5	·12	0.3	0.1	8.3	26	70.4	25.0	T	72.5	30.2	15	208	305	373	0.4
3-4	1200.0	168516	43	263	12	.34	0.2	0.0	7.2	27	54.7	23.3	T	73.2	29.3	19	230	303	394	0.3
4-20	662.0*	168762	62	32	2.1	.11	0.3	0.1	4.3	34	63.8	12.3	T	75.0	31.1	21	236	315	401	0.3
5-27	1660.0	169030	68	55	3.2	.12	0.3	0.1	9.1	24	53.5	42.0	T	80.0	30.0	13	228	323	399	0.5
6-14	274.0	169121	73	99	5.0	.36	0.3	0.1	8.2	27	69.3	33.3	0.0	92.0	33.0	15	260	365	456	0.4
7-8	68.1	169284	83	31	1.4	.28	0.3	0.1	3.6	35	74.7	5.0	T	74.0	34.2	16	228	325	385	0.4
8-3	12.6	169739	76	18	1.1	.35	0.4	0.1	5.8	65	75.9	0.0	0.0	87.0	39.2	35	284	378	523	0.0
9-13	5.8	169862	72	18	0.9	.24	0.5	0.5	5.9	51	310.6	1.0	0.0	119.0	41.6	59	200	468	747	0.0

*USGS average dai1y discharge

LA MOINE RIVER AT COLMAR

The La Moine River rises in the Galesburg Plain Region, northwest of Bushnell. The gaging station is 1 mile southwest of Colmar, and the elevation of the gage datum is 491.53 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 655 square miles.

The tabulation of water quality data is for the period from August 7, 1957, to September 20, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were generally higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 4.16 inches above normal to 5.00 inches below normal, based on records for two stations within the drainage basin. The average annual departure was +3.13 inches.

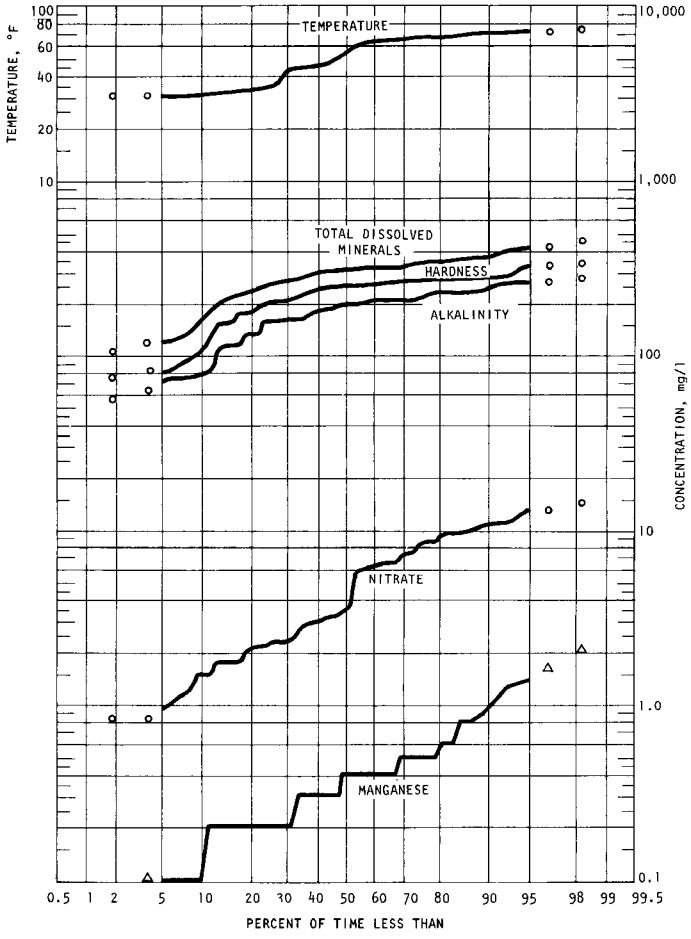
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.3 cfs/sq mi and was not less than 0.023 cfs/sq mi, with a median flow of 0.153 cfs/sq mi. The minimum average daily flow of record was 0.3 cfs in October 1957.

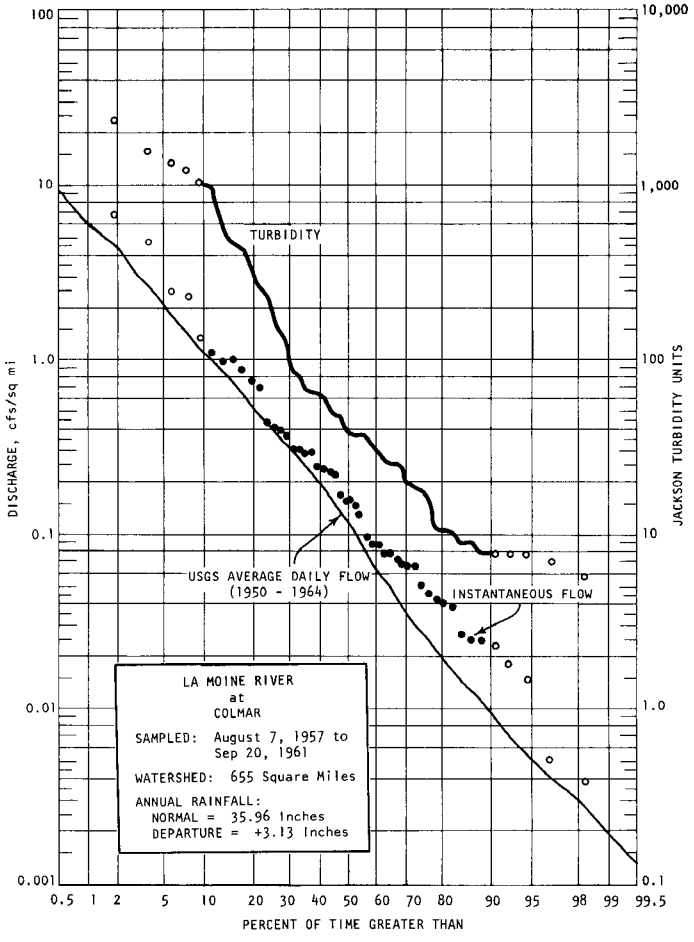
The turbidity was not less than 8 Jtu nor more than 1000 Jtu for the central 80 percent of the time, with a median value of 40 Jtu.

Reported temperatures were never over 80 F and were over 70 F for 24 percent of the time. They were below 50 F for 40 percent and below 40 F for 28 percent of the time.

The analyses indicated the following:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	78	205	250
Hardness (as $CaCO_3$)	105	250	290
Total dissolved minerals	160	320	390
Nitrate	1.5	3.5	11
Manganese	0.1	0.4	0.95





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1957																				
8-7	17.0	144130	72	62	2.5	0.5	0.3	T	7.7	12	39.5	2.1	T	50.0	18.1	13	168	200	265	
9-18	3.3	144527	65	39	2.2	0.0	0.3	T	11.3	8	36.2	1.8	0.1	71.7	23.2	9	244	275	328	
10-17	2.6	144772	56.5	54	4.1	1.4	0.2	0.2	14.9	18	38.7	2.2	0.1	67.7	20.4	25	240	254	329	
11-15	15.0	145002	46.5	37	2.8	0.5	0.3	0.1	11.2	14	53.9	1.8	T	51.6	19.6	15	164	210	285	
12-17	9.6	145311	34	6	1.2	0.4	0.3	0.0	6.3	25	74.3	1.5	T	67.0	25.2	32	216	271	370	
1958																				
1-15	51.0	145492	32.5	9	0.4	0.2	0.3	T	10.9	20	83.1	7.6	T	69.0	27.4	25	218	285	382	
2-27	582.0	145885	35	444	8.2	0.1	0.2	0.1	8.8	7	36.0	9.4	T	30.5	11.0	6	80	122	186	
3-26	58.0	146075	46	8	1.1	0.2	0.2	0.1	4.7	15	77.1	1.5	T	63.1	23.9	17	192	257	331	
4-23	154.0	146460	58	68	8.8	0.5	0.2	0.0	6.2	16	75.3	3.1	T	59.1	22.7	16	172	242	313	
5-22	46.0	146736	69	61	3.8	0.2	0.1	0.0	11.9	14	61.7	3.0	T	60.7	33.2	1	204	289	314	
6-20	260.0	146986	69	1000	20	0.8	0.3	0.0	12.6	6	47.7	9.7	T	53.6	19.4	3	160	214	272	
7-30	1650.0	147344	69	1800	23	0.9	0.1	0.0	8.2	2	9.9	1.0	T	22.8	5.7	5	76	81	108	
8-26	63.0	147541	68	18	1.7	0.1	0.2	0.1	14.4	12	47.9	3.6	T	68.5	26.0	11	232	279	330	
9-25	144.0	147780	69.5	144	5.1	0.4	0.2	0.1	19.3	14	52.0	3.0	T	61.3	22.3	23	220	245	344	
10-31	28.0	148090	47	11	2.2	0.3	0.3	0.1	10.2	17	53.9	0.8	T	66.2	26.1	20	236	273	366	
11-19	194.0	148250	50	80	5.0	0.4	0.3	0.1	10.6	15	54.7	0.8	T	49.1	26.4	7	168	231	279	
12-12	16.0	148388	32	11	1.4	0.6	0.3	0.1	12.3	19	76.7	1.8	T	83.7	32.7	19	276	344	428	
1959																				
1-17	30.0	148691	32	10	0.4	0.4	0.1	0.1	8.5	20	84.5	3.2	0.1	85.2	45.2	5	292	349	462	
2-25	1530.0	148936	33	176	10.1	0.5	0.1	0.0	8.9	6	28.0	2.2	T	21.2	5.8	9	56	77	132	
3-20	194.0	149085	48	20	2.3	0.5	0.1	0.0	11.2	11	67.5	5.9	T	64.4	24.1	12	200	260	326	
4-24	201.0	149380	61	27	2.2	0.1	0.2	0.0	8.3	11	74.7	7.2	0.1	65.0	23.0	17	196	257	337	
5-22	711.0	149679	70.5	473	14	1.0	0.2	0.0	10.7	5	36.6	2.3	T	37.6	14.1	5	116	152	216	
6-16	51.0	149937	75.5	39	2.0	0.3	0.2	0.1	14.6	13	55.5	6.2	T	64.3	28.8	16	232	279	349	
7-24	448.0	150138	74	1570	26	1.6	0.2	0.1	7.3	7	16.0	3.2	0.1	22.5	6.4	11	78	83	125	
8-27	44.0	150474	78	19	1.2	0.4	0.3	0.1	24.8	11	48.1	2.9	0.1	74.8	22.1	19	252	278	373	
9-10	44.0	150622	69.5	36	2.6	0.4	0.3	0.0	10.1	7	49.4	3.4	T	65.5	19.9	14	212	246	308	
10-20	298.0*	150894	53	26	1.8	0.2	0.3	0.1	13.0	9	50.0	8.2	T	61.5	23.3	12	204	250	321	
11-24	101.0	151096	34.5	7	1.0	0.2	0.2	0.0	9.5	12	58.4	5.8	T	66.8	25.0	15	220	270	322	
12-23	86.0	151417	36	8	1.1	0.2	0.2	0.0	5.5	11	65.8	2.4	0.1	64.1	25.7	15	212	266	325	0.1
1960																				
1-29	240.0	151560	32.5	33	1.0	0.2	0.2	0.0	12.5	10	65.6	10.0	0.1	60.6	25.2	12	192	255	320	0.2
2-29	100.0	151774	32	235	10	0.3	0.2	0.0	10.9	16	67.9	11.4	T	64.1	25.4	19	204	265	339	0.2
4-2	3160.0	151976	43	263	6.5	0.2	0.2	0.0	7.6	6	28.2	2.3	T	27.0	6.4	5	64	94	122	0.3
4-19	4550.0	152097	54	970	27	0.5	0.2	0.0	9.0	6	26.1	9.5	0.1	28.6	7.7	7	76	103	154	0.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
5-16	850.0	152261	65	2100	62	2.0	0.2	0.0	6.4	8	47.9	8.5	0.1	49.9	15.1	8	136	187	234	0.3
6-7	640.0	152387	67	1380	29	0.8	0.2	0.1	11.1	6	37.0	13.2	0.1	43.2	12.1	9	120	158	225	0.7
7-21	162.0	152830	74	49	2.9	0.2	0.2	0.0	13.0	8	52.9	13.5	T	63.3	22.9	18	204	252	311	0.3
8-17	111.0	153030	71	39	2.8	0.1	0.2	0.1	10.0	8	50.2	6.6	0.1	63.2	23.8	12	212	256	317	0.1
9-20	33.0	153277	67	26	1.6	0.4	0.1	0.2	8.8	18	66.4	1.2	T	68.1	26.6	27	244	280	378	0.1
10-13	16.0	153492	63	28	2.1	0.6	0.2	0.1	7.4	18	66.7	2.6	T	70.0	24.8	26	236	277	354	0.2
11-11	43.0	153597	38	24	1.2	0.2	0.2	0.1	10.4	13	63.2	2.4	T	58.1	20.7	18	184	230	311	0.0
12-13	27.0	153819	33	9	0.8	0.3	0.2	0.2	5.1	19	74.5	2.9	T	70.0	27.5	27	240	288	381	0.0
1961																				
1-11	25.0	154058	32	8	0.7	0.3	0.3	0.1	3.9	24	76.3	6.5	0.1	74.2	16.9	62	272	255	416	0.0
2-8	12.0	154195	32	8	1.4	1.3	0.4	0.1	7.3	27	81.7	6.1	T	81.7	31.0	33	276	332	436	0.0
3-15	640.0	154354	46	600	12	0.4	0.1	0.1	10.4	10	60.7	14.7	0.1	46.6	15.4	13	120	180	247	0.4
4-12	150.0	154614	46	16	0.8	0.2	0.2	0.1	4.7	10	77.8	6.5	0.1	66.1	24.4	19	208	266	333	0.1
5-17	265.0	154834	66	325	7.7	0.4	0.2	0.1	8.7	9	60.7	10.7	T	54.4	19.7	12	160	217	294	0.3
6-21	56.0	155084	72	49	4.0	0.4	0.2	0.1	9.8	13	60.7	6.0	0.1	67.4	23.7	19	220	266	345	0.2
7-18	96.0	155302	75	121	5.3	0.3	0.2	0.1	10.4	9	44.4	11.1	0.1	47.7	15.2	10	136	182	235	0.3
8-23	200.0	155528	68	67	3.0	0.3	0.2	0.1	12.3	6	60.1	7.5	0.1	53.2	18.7	16	168	210	309	0.2
9-20	493.0	155695	66	87	4.9	0.3	0.2	0.1	11.2	5	45.3	8.5	T	54.9	21.5	9	184	226	272	0.4

*USGS average daily discharge

LITTLE WABASH RIVER AT CARMI

The Little Wabash River rises in the Springfield Plain Region southwest of Mattoon and flows in a generally southerly direction through the Springfield Plain and into the Mt. Vernon Hills Region. The gaging station is 2.3 miles south of the Main Street Bridge in Carmi, and the elevation of the gage datum is 339.91 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 3111 square miles.

The tabulation of water quality data is for the period from June 13, 1957, to September 20, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were substantially higher from 40 to 93 percent of the time than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 19.44 inches above normal to 9.02 inches below normal, based on records for two stations within the drainage basin. The average annual departure was +2.84 inches.

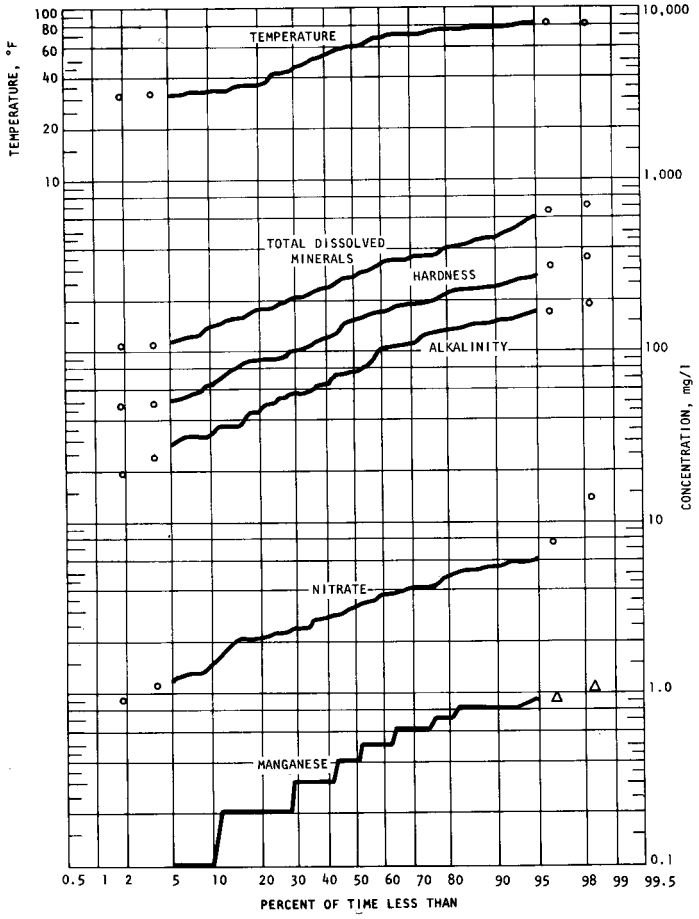
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 2.4 cfs/sq mi and was not less than 0.013 cfs/sq mi, with a median flow of 0.317 cfs/sq mi. The minimum average daily flow of record was 0 cfs in September 1952.

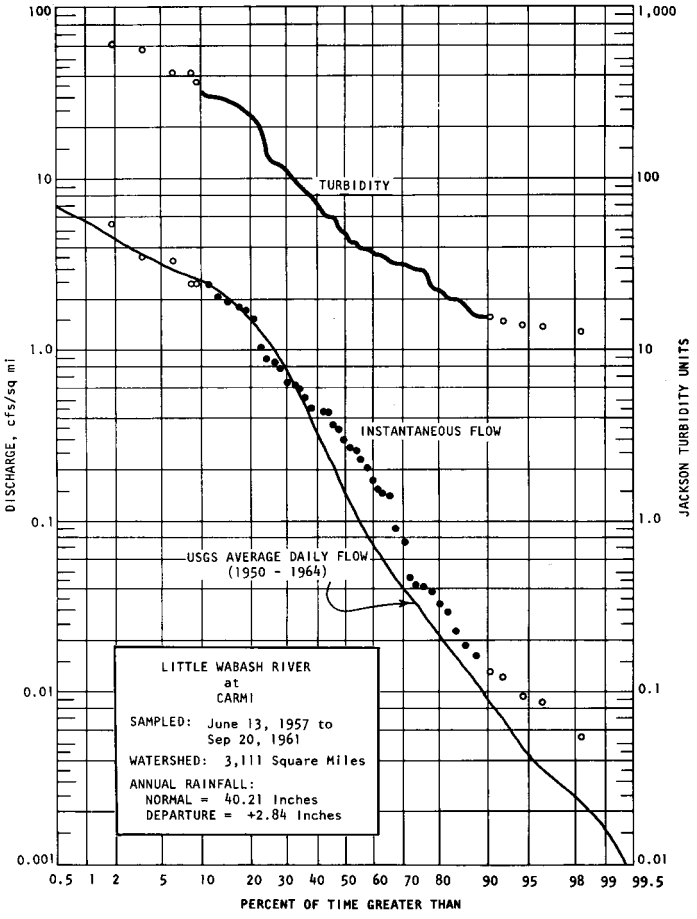
The turbidity was not less than 15 Jtu nor more than 360 Jtu for the central 80 percent of the time, with a median value of 50 Jtu.

Reported temperatures were over 80 F for 7 percent and over 70 F for 38 percent of the time. They were below 50 F for 35 percent and below 40 F for 24 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	35	75	150
Hardness (as $CaCO_3$)	65	150	240
Total dissolved minerals	140	280	470
Nitrate	1.5	3.2	5.4
Manganese	0.1	0.4	0.8





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved mineals TDM	Phosphate (filtered) PO_4
1957																				
6-13	7510.0	143607	75	100	5.2	0.5	0.2	0.1	6.8	26	28.6	3.4	0.1	22.6	7.9	12	48	89	144	
7-12	5400.0	143885	78	89	2.8	0.2	0.2	T	6.8	15	16.7	2.8	T	20.5	7.3	5	52	82	112	
8-8	1960.0	144158	78	300	3.5	0.2	0.2	0.1	6.3	25	50.0	2.7	0.1	30.0	7.9	19	60	107	188	
10-11	38.0	144716	62	36	1.7	0.5	0.2	0.4	7.1	35	29.6	3.3	T	25.8	8.6	22	64	100	182	
11-18	6030.0	145115	54	420	8.8	0.4	0.2	0.0	7.9	56	48.1	2.1	T	21.8	9.0	38	44	92	218	
12-13	1350.0	145268	37	47	3.6	T	0.1	0.1	10.1	65	92.6	3.2	T	42.0	17.3	42	76	176	334	
1958																				
1-13	7440.0	145489	36	120	4.2	0.2	0.1	0.0	7.9	24	36.8	2.1	T	18.5	2.7	29	36	58	155	
2-11	1130.0	145733	33	16	0.6	0.2	0.2	0.0	12.8	80	119.3	4.1	T	52.5	23.7	51	100	229	414	
3-11	4700.0	145980	37	610	12	0.5	0.1	0.0	7.4	41	73.6	3.8	T	25.0	10.4	29	32	106	230	
4-15	714.0	146332	53	60	4.6	0.5	0.2	0.0	7.5	67	103.9	2.1	T	49.0	20.5	47	106	207	365	
5-17	1070.0	146678	69	20	1.6	0.3	0.0	0.0	9.5	39	59.0	1.7	T	53.5	10.2	8	76	176	237	
6-23	2430.0	146987	71	380	7.0	0.2	0.1	0.0	6.5	34	32.1	3.8	0.1	21.1	6.1	23	44	78	170	
7-22	10200.0	147276	75	86	3.5	T	0.2	0.0	8.8	23	27.6	1.4	0.1	16.8	5.0	16	36	63	126	
8-19	2600.0	147507	78	51	2.6	0.5	0.1	0.0	9.6	50	34.6	4.6	T	28.5	11.0	34	80	117	224	
9-23	900.0	147759	69	124	3.2	0.3	0.2	0.0	7.1	35	33.7	1.3	T	25.8	8.5	19	56	100	177	
10-21	126.0	148009	60	36	1.9	0.2	0.1	0.0	6.8	37	43.2	3.9	T	36.8	13.6	28	108	148	243	
11-17	278.0	148211	57	30	1.6	0.6	0.2	0.1	7.7	50	39.9	2.7	T	42.1	11.6	32	108	153	260	
12-11	3130.0	148382	33	30	3.4	0.3	0.1	0.0	10.2	49	79.4	2.9	T	31.4	13.0	36	56	132	280	
1959																				
1-26	7750.0	148732	33	136	5.3	0.3	0.1	0.1	5.3	25	32.5	2.1	0.1	14.8	3.9	17	20	53	139	
2-20	11000.0	148900	34	250	9.8	0.3	0.1	0.0	8.6	21	42.4	1.3	T	17.4	6.2	19	36	69	153	
3-23	1800.0	149158	47	600	10.7	0.6	0.1	0.0	8.3	42	76.1	5.4	T	29.8	11.8	42	72	123	277	
4-16	470.0	149327	56	33	2.1	0.6	0.1	0.0	7.9	78	118.5	1.9	0.2	66.6	23.5	57	152	263	473	
5-18	1340.0	149643	63	194	11	0.8	0.2	0.1	7.6	75	89.5	2.3	T	37.4	15.0	54	72	155	364	
6-27	130.0	149950	81	43	2.4	0.1	0.1	0.0	6.6	95	61.7	4.0	T	43.0	14.5	61	98	167	342	
7-25	90.0	150141	81	34	1.5	0.9	0.2	0.2	6.2	65	49.8	3.2	T	49.4	18.1	54	170	198	343	
8-21	5610.0	150421	77	220	7.3	0.3	0.2	0.0	6.8	30	20.6	2.2	T	13.9	3.6	18	24	50	121	
9-22	40.0	150674	77	31	2.2	0.5	0.2	0.0	6.1	41	27.6	4.8	0.1	25.0	7.7	28	64	94	183	
10-9	230.0	150822	69	60	3.7	0.6	0.1	0.0	7.5	53	39.7	2.2	0.1	30.7	11.2	32	76	123	241	
11-7	800.0	150981	51	32	1.5	0.7	0.2	0.0	8.4	166	67.1	3.0	0.1	58.1	22.0	100	148	236	514	
12-14	6320.0	151237	44	420	12	0.8	0.1	0.0	6.9	41	55.5	3.3	0.1	20.7	9.0	28	32	89	211	0.2
1960																				
1-8	825.0	151414	36	39	2.4	0.4	0.2	0.0	5.9	80	101.0	2.4	T	43.4	18.6	55	84	185	360	T
2-5	2000.0	151609	38	289	9.0	0.2	0.2	0.0	6.9	82	109.6	5.1	0.1	43.4	20.1	53	76	191	375	0.1
3-14	444.0	151832	34	16	0.6	0.8	0.2	0.1	9.3	162	176.5	3.7	T	81.6	36.6	105	168	355	676	0.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
4-18	530.0	152070	61	81	1.8	0.8	0.1	0.0	6.7	80	97.9	2.4	T	53.2	21.5	57	128	222	415	0.1
5-16	440.0	152265	61	64	3.4	0.6	0.2	0.0	8.5	92	102.6	3.1	T	53.6	24.4	60	125	233	441	0.3
6-20	1400.0	152525	71	270	7.1	0.4	0.1	0.1	7.6	37	38.1	13.9	T	24.2	7.7	28	56	92	199	0.2
7-22	144.0	152828	70	36	2.2	1.0	0.2	0.0	8.7	52	46.9	5.1	T	43.1	15.3	36	124	171	289	0.3
8-18	57.0	153027	81	20	0.9	0.4	0.2	0.0	5.9	70	46.5	1.1	0.1	49.9	18.4	23	152	201	315	0.6
9-15	29.0	153253	73	14	1.3	0.8	0.2	0.0	5.5	70	31.7	5.0	T	41.0	13.7	41	108	159	278	0.5
10-10	27.0	153374	72	18	0.9	0.7	0.1	0.1	21.5	71	23.5	7.7	T	48.0	17.0	46	148	190	369	0.9
11-8	17.0	153577	48	15	0.3	0.1	0.1	0.1	4.4	95	38.5	2.4	0.1	60.1	21.0	62	196	237	407	0.3
12-8	1600.0	153763	43.5	309	9.6	0.4	0.1	0.1	5.6	106	47.1	5.3	0.1	29.0	10.1	63	48	114	320	0.2
1961																				
1-4	117.0	153939	33.5	14	1.1	0.3	0.2	0.1	7.8	160	96.3	5.8	T	61.3	24.7	99	140	255	578	0.2
2-9	100.0	154162	33.5	13	0.8	0.6	0.1	0.1	3.8	235	151.4	0.9	T	74.8	31.1	139	128	315	725	0.6
3-2	2750.0	154305	43.5	102	3.4	0.2	0.1	0.1	7.6	70	95.7	5.8	0.1	35.2	14.1	50	52	146	339	1.0
4-6	640.0	154568	49.5	39	2.6	0.8	0.2	0.1	9.2	94	121.4	4.1	T	55.8	24.2	62	112	239	460	0.1
5-23	16700.0	154867	66	43	2.2	0.1	0.2	0.1	6.8	10	24.5	2.7	0.1	12.0	4.4	12	32	48	110	0.6
7-13	68.0	155292	78	23	1.4	0.9	0.2	0.0	8.1	70	54.9	4.1	0.1	48.5	16.7	69	132	190	346	0.3
8-16	1390.0	155479	77	69	4.8	0.2	0.1	0.2	7.2	45	32.3	4.1	0.1	24.8	7.5	33	64	93	213	0.2
9-20	51.0	155691	70	22	0.8	0.7	0.2	0.1	7.8	53	44.2	4.0	T	47.4	15.9	35	136	184	300	0.5

MISSISSIPPI RIVER AT CHESTER

The Mississippi River is intersectional and flows along the entire western border of the state. The gaging station at Chester is 8.1 miles downstream from the Kaskaskia River, and the elevation of the gage datum is 341.05 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 712,600 square miles.

Tabulations of water quality data are from samples collected at Grand Tower below Chester and analyzed by the Central Illinois Public Service Company for March 1, 1955, to May 3, 1960, and for June 1, 1960, to August 3, 1965. Discharge and quality data are also summarized graphically.

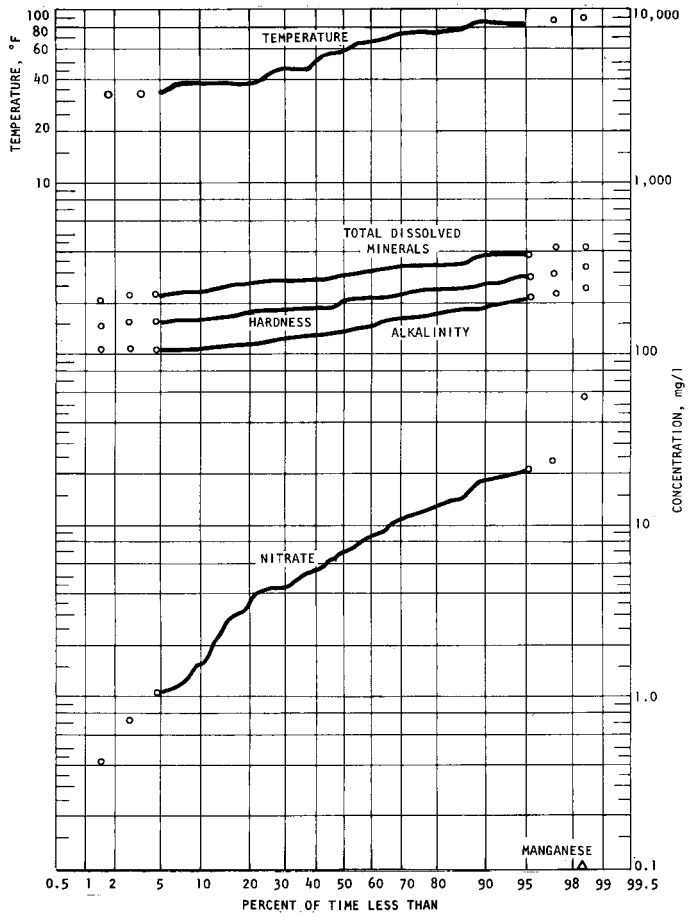
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.38 cfs/sq mi and was not less than 0.083 cfs/sq mi, with a median flow of 0.158 cfs/sq mi, during the period from 1955 to 1960. Instantaneous flow values for the 1960-1965 period were not analyzed.

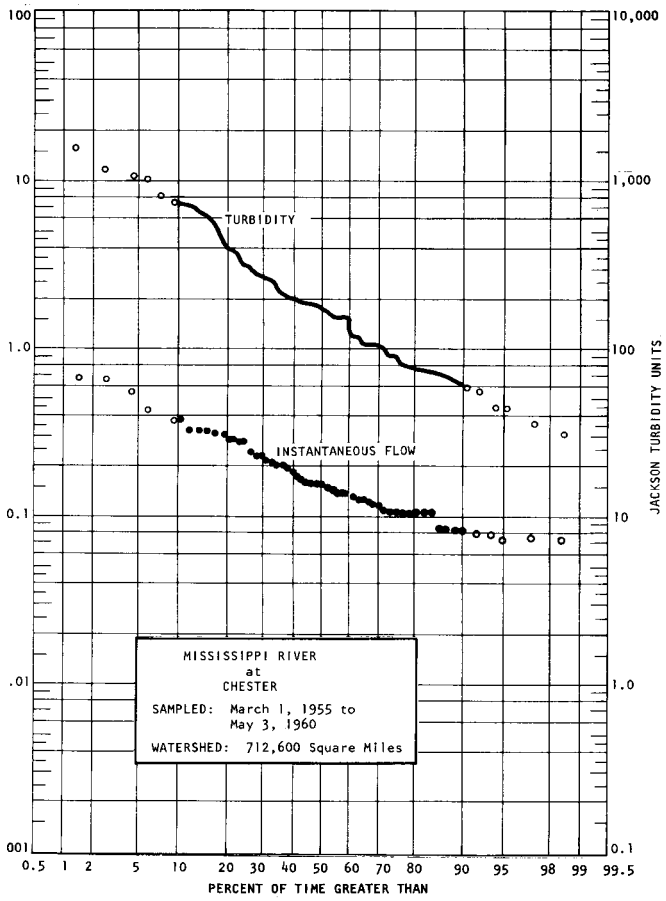
The turbidity was not less than 60 Jtu (1955-1960) or 65 Jtu (1960-1965), nor more than 770 Jtu (1955-1960) or 800 Jtu (1960-1965), for the central 80 percent of the time. Median values were 180 Jtu (1955-1960) and 230 Jtu (1960-1965).

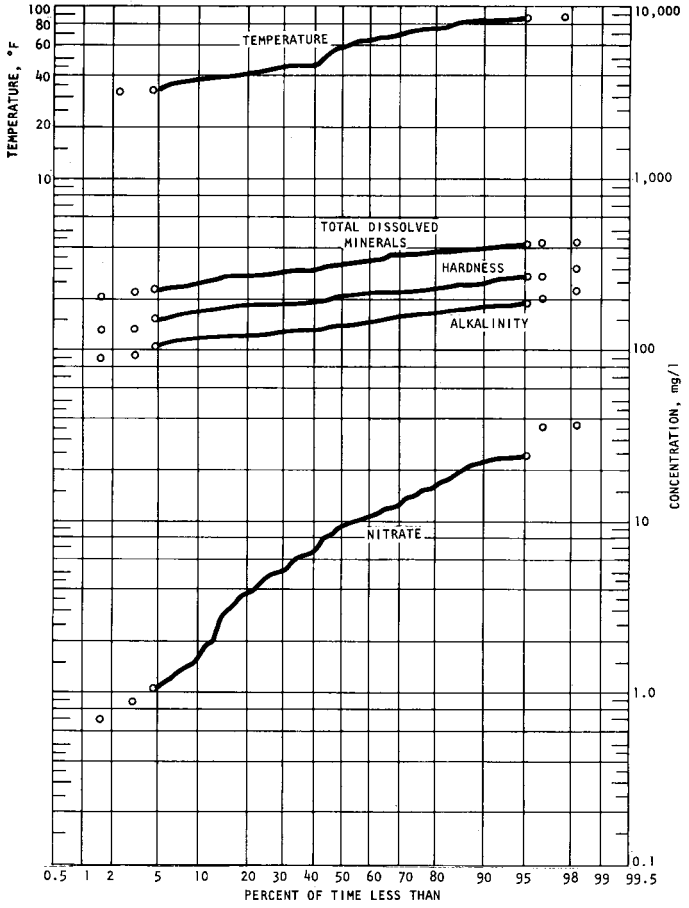
Reported temperatures were over 80 F for 15 (1955-1960) or 14 (1960-1965) percent of the time, and over 70 F for 35 (1955-1960) and 30 (1960-1965) percent of the time. They were below 50 F for 42 percent of the time (1955-1960 and 1960-1965) and below 40 F for 22 (1955-1960) and 16 (1960-1965) percent of the time.

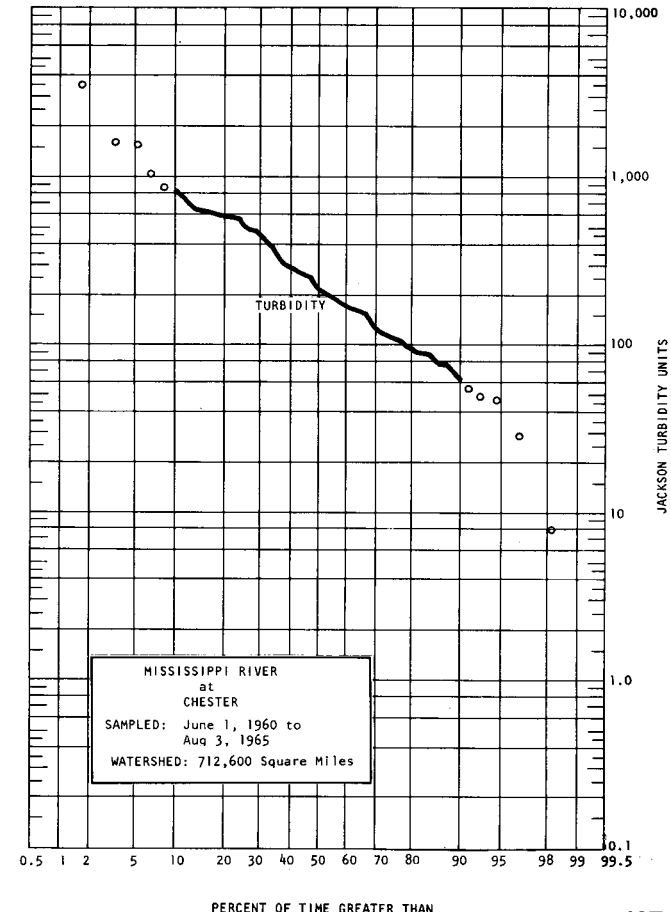
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1955-1960)	105	135	185
	(1960-1965)	115	140	180
Hardness (as $CaCO_3$)	(1955-1960)	160	200	250
	(1960-1965)	165	205	245
Total dissolved minerals	(1955-1960)	235	290	365
	(1960-1965)	250	310	395
Nitrate	(1955-1960)	1.5	6.8	18
	(1960-1965)	1.6	9.4	22.1
Manganese	(1955-1960)	0	0	0
	(1960-1965)	0	0	0


TEMPERATURE, °F
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
INSTANTANEOUS FLOW
MISSISSIPPI RIVER
at
CHESTER
SAMPLED: March 1, 1955 to
May 3, 1960
WATERSHED: 712,600 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN


TEMPERATURE, °F
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
MISSISSIPPI RIVER
at
CHESTER
SAMPLED: June 1, 1960 to
Aug 3, 1965
WATERSHED: 712,600 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCo_3$)		TDM	PO_4
1955																				
3-1		D-714		776	0.2	0.0			24.0	26	43.7	11.8	0.6	40.0	12.6	17	108	152	221	0.0
4-4		D-738	47	60.6	0.1	0.0			15.6	23	58.5	3.8	0.1	54.4	18.2	16	150	211	269	0.0
5-3		D-755	64	814	0.3	0.0			24.6	20	59.5	18.7	0.4	46.8	15.9	18	120	182	274	0.0
6-1		D-769	73	419	0.1	0.0			13.0	37	78.2	4.2	0.5	52.0	18.8	27	136	237	283	0.0
7-5		D-786	82	1231	0.2	0.0			22.4	24	63.6	18.1	0.3	43.1	13.6	24	106	164	261	0.0
8-1		D-800	90	270	0.1	0.0			15.6	22	99.5	10.9	0.4	46.8	16.0	31	119	183	313	0.0
9-6		D-819	76	76	0.1	0.0			20.2	18	77.2	1.2	0.4	58.6	15.1	25	164	208	307	0.0
10-4		D-830	71	81.6	0.1	0.0			17.0	23	79.1	4.6	0.1	66.7	17.8	27	185	240	337	0.0
12-1		D-875	42	45.6	0.2	0.0			11.6	33	87.9	3.3	0.3	62.1	17.0	35	164	225	336	0.0
1956																				
1-3	52700.0*	D-890	40	64	0.0	0.0			12	32	87.1	5.3	0.4	53.4	17.6	39	153	205	341	
2-1	56000.0*		39	278	0.1	0.0			17	27	76.6	7.7	0.4	53.0	15.2	27	137	194	296	
3-5	92000.0*	D-955	48	380	0.1	0.0			13.4	28	73.7	14	0.4	50.9	16.3	28	133	194	295	
4-2	107000.0*	D-967	59	108	0.2	0.0			18.8	28	69.6	8.3	0.3	61.3	18.3	26	170	228	319	
5-1	201000.0*	D-989	57	162	0.1	0.1			16.2	18	54	13.6	0.4	39.8	12.7	21	108	151	277	
6-5	163000.0*	D-1006	73	193	0.1	0.0			15	21	61.3	5.7	0.4	52.2	14.8	19	140	191	254	
7-2	114000.0*	D-1028	84	208	0.1	0.0			13.4	27	78.2	6.3	0.2	44.7	14.6	27	110	171	266	
8-6	118000.0*	D-1067	86	125	0.1	0.0			14.2	24	77.7	4.3	0.1	52.6	14.7	29	138	191	281	
9-4	100000.0*	D-1087	79	224	0.0	0.0			11.6	26	99.5	8.2	0.2	45.4	16.2	36	115	180	287	
10-3	60200.0*	D-1112	70	158	0.1	0.0			12.8	23	166.6	10.2	0.2	54.3	18.1	58	130	210	400	
11-5	55300.0*	D-1125		32	0.0	0.0			17.4	30	81.3	4.1	0.2	78.8	19	28	211	275	364	
12-4	51500.0*	D-114,0	38	107	0.0	0.0			11.2	29	75.6	5.1	0.2	47.8	17	28	137	193	281	
1957																				
1-2	62.3	D-1164	38	92	0.1	0.0			7.8	32	66.5	19.7	0.1	52.7	18	26	140	206	300	
2-4	58.8		34	96	0.1	0.0			9.2	36	54	6.7	0.2	49.4	16	23	134	190	257	
3-5	113.0	D-1199	45	168	0.1	0.0			12.6	30	64.9	0.7	0.4	42.2	14	18	103	165	230	
4-1	124.0	D-1220	48	193	0.0	0.0			6.8	29	62.2	13.6	0.4	40.5	15	25	108	164	240	
5-6	219.0	D-1241	64	262	0.1	0.0			8.4	20	54.5	8.8	0.3	42.9	13	18	112	161	221	
7-1	307.0	D-1284	75	557	0.1	0.0			15.8	14	47.3	11	0.5	47.2	12	13	126	170	236	
8-6	166.0	D-1313	85	176	0.1	0.0			15.6	21	57.4	6.3	0.1	60.8	18	16	173	225	305	
9-3	101.0	D-1329	82	194	0.4	0.0			7.0	23	100.7	1.0	0.3	53.2	16	31	137	201	305	
10-1	83.8	D-1345	67	285	0.1	0.0			14.4	24	90.6	6.9	0.2	57.6	16	32	152	212	319	
11-18	90.6	D-1364	50	719	0.8	0.0			9.8	23	82.2	4.2	0.1	50.4	16	27	135	194	306	
12-2	77.4	D-1374	39	192	0.2	0.0			13.6	29	71.6	2.9	0.2	52.8	20	23	144	214	278	
1958																				
1-6	94.4	D-4	46	160.0	0.1	0.0			11.0	24.3	72.7	9.1		53.2	16.8	17.0	126	192	272	
2-3	85.8	D-19		79.2	0.2	0.0			12.8	26.8	87.9	12.9		58.0	20.1	29.3	157	232	317	
3-4	272.0	D-39	43	1138.0	0.1	0.0			18.2	18.2	67.6	1.5		40.8	11.8	21.9	107	156	220	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCo_3$)	Total hardness (as $CaCo_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1958																				
4-3	144.0	D-59	50	123.0	0.2	0			16.8	20.0	68.7	7.8		50.0	16.6	19.3	132	192	257	
6-2	98.0	D-99	74	67.6	0	0			18.4	23.7	75.7	3.0		72.8	17.8	25.0	197	248	353	
7-1	175.0	D-126	69	187.0	0.1	0			22.4	21.3	70.5	10.4		69.2	17.4	23.8	191	248	327	
8-4	482.0	D-175	78	761.0	0	0			13.4	17.0	40.6	12.2		40.8	9.7	22.2	118	144	210	
9-2	84.2	D-191	80	113.0	0.1	0			16.6	28.0	83.6	2.4		91.2	22.1	21.5	247	320	401	
10-1	113.0	D-215	69	330.0	0.2	0			39.6	24.3	77.9	20.2		79.4	20.2	29.6	217	280	380	
11-4	81.8	D-249	55	36.4	0.1	0			23.8	28.0	81.1	5.4		79.8	20.9	22.4	222	284	406	
12-2	78.6	D-264	41	71.0	0.1	0			19.2	26.1	69.2	4.1		56.0	13.8	21.2	143	200	280	
1959																				
1-7	58.7	D-287	38	57.0	0.1	0			20.6	29.2	93.7	4.3		64.2	23.4	28.2	180	252	352	
2-3	85.8	D-305	33	106.4	0.1	0			19.6	29.2	69.0	4.8		48.5	15.7	22.6	121	192	283	
3-3	226.0	D-328	38	294.0	0.1	0			11.6	21.9	49.4	5.5		41.1	12.3	18.2	110	160	229	
4-1	309.0	D-344	46	1000.0	0.1	0			20.6	18.2	50.5	6.9		44.6	14.2	11.7	115	168	253	
5-1	194.0	D-363	62	320	0	0			14.4	18.8	114.0	54.4		52.0	13.2	60.2	130	188	380	
6-2	272.0	D-389	74	693	0.7	0			22.4	18.2	66.3	7.1		48.1	14.7	21.8	130	180	279	
7-3	142.0	D-476	84	111	0.3	0			11.6	26.1	75.4	13.0		63.4	18.5	31.6	180	240	234	
8-1	87.4	D-496	76	44.8	0	0			14.6	26.1	83.2	0.4		68.1	17.3	30.4	185	252	340	
9-1	113.0	D-520	75	78.0	0	0			14.6	31.0	68.5	2.0		62.0	18.2	23.3	171	232	326	
10-1	232.0	D-555	68	402	0.1	0			16.4	24.3	52.1	4.3	0.3	55.5	16.1	17.2	154	212	265	
11-3	137.0	D-667	56	230	0.1	0			20.4	24.3	74.1	1.1	0.5	50.9	17.2	16.7	130	204	301	
12-1	93.5	D-707		81.5	0.1	0			12.2	28.0	68.2	12.4	0.5	59.7	21.3	18.0	161	244	332	
1960																				
1-2	201.0	D-734	40	180	0	0			10.0	24.9	58.8	8.8	0.6	53.6	20.5	13.2	150	224	299	
2-1	151.0	D-747		621	0.1	0			12.0	35.2	55.8	18.1	0.6	52.4	19.9	15.4	130	216	295	
3-1	113.0	D-769	33	83.0	0.1	0			12.8	24.3	75.7	22.9	0.4	61.6	20.0	20.8	158	238	330	
4-1	491.0	D-797	45	1639.0	0	0			13.2	24.3	48.4	16.2	0.4	42.4	12.2	22.1	114	160	243	
5-3	406.0	D-820	64	205.0	0	0			10.8	17.6	53.1	1.5	0.3	53.7	15.6	5.3	135	192	252	
6-1	378.0	D-854	73	585.0	0	0			12.4	20.7	68.9	35.1	0.4	47.8	11.1	30.5	113	168	294	
7-1	305.0	D-922	68	452.0	0	0			19.4	24.3	76.0	6.4	0.1	85.1	22.0	14.8	224	308	417	
8-2	103.0	D-944		165.0	0.2	0			10.4	22.5	83.4	8.4	0.4	59.6	17.6	25.3	157	228	331	
9-1	116.0	D-1038			0.1	0			7.6	23.1	80.4	2.9	0.4	53.0	16.0	22.4	132	196	316	
10-3	115.0	D-1045		252.0	0.1	0			11.4	22.5	80.4	1.2	0.6	51.4	14.7	24.2	130	188	296	
11-1	85.2	D-1083			0.2	0			11.0	21.9	99.6	9.5	0.6	52.6	17.7	34.7	142	216	322	
12-1	82.0	D-7			0.1	0			13.0	25.6	76.2	12.3	0.1	61.4	19.7	23.6	168	224	327	
1961																				
1-5		No River Sample																		
2-1	49.9	D-53	39	7.5	0.1	0			14.4	29.2	82.8	12.4	0.2	59.4	20.5	35.0	179	236	347	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
3-1		D-76	47	582	0.2	0.0			8.0	21	48.4	1.5	0.3	45.6	14.2	14	128	172	253	0.0
4-4		D-98		801	0. 1	0.0			12.0	15	42.8	22.9	0.3	45.2	11.4	18	120	160	248	0.0
5-5		No river water sample																		
6-1		D-148		410	0.0	0.0			8.0	19.5	57.7	3.8	0.2	45.6	14.0	17.5	125	172	229	0.0
7-6		D-191		875	0.2	0.0			13.4	24.9	89.2	21.2	0.2	48.8	15.1	34.6	121	184	306	0.0
8-1		D-223		702	0.1	0.0			6.8	16.0	60.6	9.7	0.1	35.6	9.1	24.5	92	126	200	0.0
10-4		D-345	65	305	0.0	0.0			10.0	33.4	58.5	6.3	1.0	41.0	11.7	30.2	112	151	242	0.0
11-1		D-383	58	167	0.1	0.0			10.0	22.3	68.5	24.6	0.1	60.3	19.6	21.3	169	231	303	0.0
12-4		D-408	40	115	0.1	0.0			8.2	20.9	68.5	16.6	0.4	65.3	22.6	18.5	189	256	345	0.0
1962																				
1-2		D-12	32	156	0.1	0.1			10.8	33	117.4	6.7	0.2	64.5	20.8	40	173	244	368	0.0
2-7		D-47	33	484	0.1	0.1			16.6	22	64.9	10.8	0.3	50.7	15.9	20	132	192	273	0.0
3-2		D-89	38	296	0.1	0.1			9.6	23	66.9	2.0	0.5	53.6	16.6	16	138	196	271	0.0
4-3		D-l08	47	591	0.1	0.1			17.4	21	40.3	15.1	0.3	42.1	12.5	9	104	152	238	0.0
5-1		D-146	63	136	0.1	0.1			23.2	19	54.8	8.7	0.1	52.6	17.2	10	138	200	285	0.0
6-4		D-180	72	1638	0.1	0.1			14.4	18	62.2	24.2	0.2	48.7	12.5	26	130	176	265	0.0
7-10		D-221	82	490	0.1	0.1			11.6	19	60.8	0.9	0.1	47.9	15.4	14	130	182	269	0.0
8-1		D-258	79	630	0.1	0.1			10.2	16	66.3	18.5	0.2	56.4	18.0	15	147	212	295	0.0
9-7		D-289	76	252	0.1	0.1			23.8	27	108.1	5.0	0.4	62.2	21.2	30	160	240	387	0.0
10-2		D-308		620	0.2	0.1			9.4	21	79.9	6.1	0.1	48.3	15.5	27	130	188	281	0.0
11-1		D-374	55	216	0.1	0.1			20.0	27	91.4	14.4	0.2	59.1	18.4	31	149	222	368	0.0
12-4		D-396	53	87	0.1	0.1			16.2	29	108.3	15.1	0.2	63.4	20.8	37	164	248	368	0.0
1963																				
1-8		D-25	45	55	0.1	0.1			9.0	34	82.4	10.2	0.1	67.8	21.6	31	189	260	372	0.0
2-12		D-75		29	0.1	0.1			8.8	36	103.4	15.4	0.2	74.3	23.4	30	182	276	425	0.0
3-5		D-l03	48	108	0.1	0.1			12.0	34	89.8	20.1	0.1	60.2	18.2	41	166	232	380	0.0
4-10		D-136	58	475	0.21	0.1			18.6	22	51.1	37.0	0.3	43.8	11.9	23	109	156	268	0.0
5-1		D-156	63	176	0.1	0.1			6.0	31	127.5	6.2	0.1	54.8	17.5	47	137	206	340	0.0
6-14		D-196	83	611	0.1	0.1			6.2	26	89.0	11.3	0.1	58.3	16.1	24	129	210	287	0.0
7-1		D-238		325	0.1	0.1			12.0	26	89.8	14.3	0.2	51.4	15.1	39	136	194	305	0.0
8-1		D-270	86	181	0.1	0.1			7.0	30	106.1	13.3	0.2	54.5	18.9	40	143	208	359	0.0
9-4		D-306	78	225	0.1	0.1			6.8	27	125.9	1.9	0.3	60.0	19.3	38	146	220	355	0.0
10-1		D-333	69	115	0.1	0.1			12.4	28	137.2	1.4	0.2	57.5	18.6	47	151	226	396	0.0
11-12		D-376		129	0.1	0.1			17.2	33	134.7	4.3	0.2	57.9	19.4	54	158	230	380	0.0
12-2		D-396	44	79	0.1	0.1			6.4	29	128.7	8.2	0.1	58.4	20.5	47	154	228	400	0.0
1964																				
1-6		D-7	41	65	0.1	0.1			6.8	44	105.4	10.3	0.2	67.1	23.7	53	205	272	420	0.0
2-3		D-40	37	190	0.1	0.1			4.0	37	89.2	3.1	0.8	57.9	19.2	36	164	226	361	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
3-2		D-66	46	90	0.2	0.1			6.4	38	94.8	5.6	0.9	56.3	21.1	41	164	227	380	0.0
4-1		D-101	47	50	0.1	0.1			12.0	36	87.9	12.4	0.2	54.2	19.2	28	132	214	232	0.0
5-4		D-144	63	3528	0.1	0.5			14.2	18	69.4	5.2	0.6	51.0	16.3	19	140	198	296	0.0
6-1		D-163		77	0.1	0.1			12.8	20	91.4	3.8	0.2	51.8	14.2	23	123	188	285	0.0
7-6		D-213		631	0.2	0.1			18.4	21	65.1	1.1	0.1	45.8	13.2	20	119	168	268	0.0
8-3		D-242	87	155	0.1	0.1			9.0	26	119.6	3.7	0.2	54.1	16.4	44	141	212	369	0.0
9-1		D-271		200	0.1	0.1			8.4	27	131.4	9.4	0.2	56.1	18.6	50	150	220	402	0.0
10-5		D-317	66	194	0.1	0.1			7.8	31	77.5	8.8	0.1	50.6	16.3	31	134	192	323	0.0
11-2		D-346	60	47	0.1	0.1			6.4	28	123.9	5.1	0.1	52.5	17.4	55	155	208	390	0.0
12-1		D-378		94	0.1	0.1			9.4	31	109.0	11.4	0.1	56.5	14.8	47	151	204	347	0.0
1965																				
1-4		D-7	43	98	0.1	0.1			6.0	36	74.8	10.9	0.2	56.9	19.3	35	164	228	345	0.0
2-8		D-48	39	113	0.2	0.1			13.0	32	69.4	10.3	0.6	48.2	13.9	27	120	180	303	0.0
3-1		D-183	39	396	0.1	0.1			14.4	31	79.9	0.7	0.2	51.6	15.6	19	115	190	294	0.0
4-5		D-206	42	296	0.1	0.1			16.6	26	62.2	23.3	0.3	47.4	13.7	26	117	172	278	0.0
5-4		D-255		272	0.1	0.1			12.0	18	52.9	17.9	0.2	36.7	9.1	24	90	130	215	0.0
6-1		D-389	72	1577	0.1	0.1			11.2	22	76.4	4.6	0.2	51.1	12.3	20	119	176	287	0.0
7-12		D-452	81	1020	0.1	0.1			12.2	21	61.2	14.5	0.2	45.8	13.1	22	117	172	270	0.0
8-3		D-467	82	274	0.2	0.1			10.8	26	68.2	6.6	0.2	50.8	13.9	23	132	180	302	0.0
9-1		D-544		124	0.1	0.1			11.4	23	87.3	4.5	0.2	48.0	15.6	31	128	184	312	0.0
10-5		D-582		315	0.1	0.1			8.8	21	52.3	13.0	0.2	47.6	15.1	19	132	180	253	0.0
11-2		D-616	59	140	0.1	0.1			13.2	23	81.3	9.7	0.3	58.8	19.6	28	168	236	348	0.0
12-5		D-681		64	0.1	0.1			12.8	29	95.3	15.1	0.1	63.2	19.5	33	164	236	352	0.0
1966																				
1-1		D-8	43	296	0.1	0.1			13.6	26	60.8	9.4	0.4	50.0	16.8	17	127	190	287	0.0
2-1		D-66	37	104	0.1	0.1			12.4	28	84.4	11.2	0.2	69.2	24.2	22	190	274	390	0.0
3-1		D-179	39	553	0.1	0.1			14.4	24	61.8	12.9	0.2	48.4	13.5	27	130	176	267	0.0
4-1		D-218		175	0.1	0.2			14.8	17	52.9	13.3	0.2	49.6	15.8	12	132	192	267	0.0
5-2		D-261	62	153	0.1	0.1			5.8	14	61.0	17.2	0.3	48.4	15.7	15	127	184	281	0.0
6-1		D-355	65	464	0.1	0.1			2.4	13	61.8	18.1	0.2	48.8	18.0	13	131	196	284	0.0
8-8		D-407	83	255	0.1	0.1			12.0	20	104.2	7.8	0.2	52.8	17.1	33	135	200	352	0.0
9-6		D-441		107	0.1	0.1			10.6	18	96.2	12.9	0.3	52.0	16.8	34	142	200	343	0.0
10-3		D-547		331	0.1	0.1			11.0	21	137.4	14.0	0.2	61.2	18.0	43	142	226	389	0.0
11-1		D-587		65	0.1	0.1			5.6	21	121.9	3.8	0.3	53.1	18.5	41	146	210	370	0.0
12-1		D-629	53	62	0.3	0.1			10.0	23	115.7	21.2	0.3	55.0	18.0	47	145	208	365	0.0

*USGS average daily discharge

MISSISSIPPI RIVER AT EAST ST. LOUIS

The Mississippi River is intersectional and forms the entire western border of the state. The gaging station is located downstream of the west pier of Eads Bridge in St. Louis, Missouri. Elevation of the gage datum is 379.94 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of approximately 701,000 square miles.

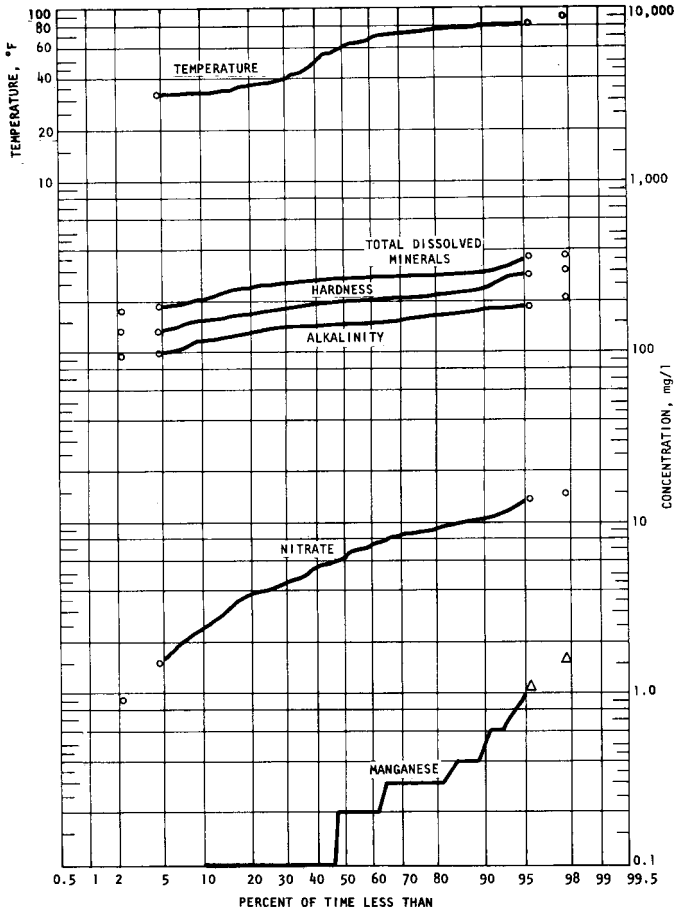
Tabulations of water quality data are for samples collected by the East St. Louis and Interurban Water Company for the periods from June 16, 1958, to September 25, 1961, and from December 18, 1961, to August 1, 1966. Quality data are also summarized graphically.

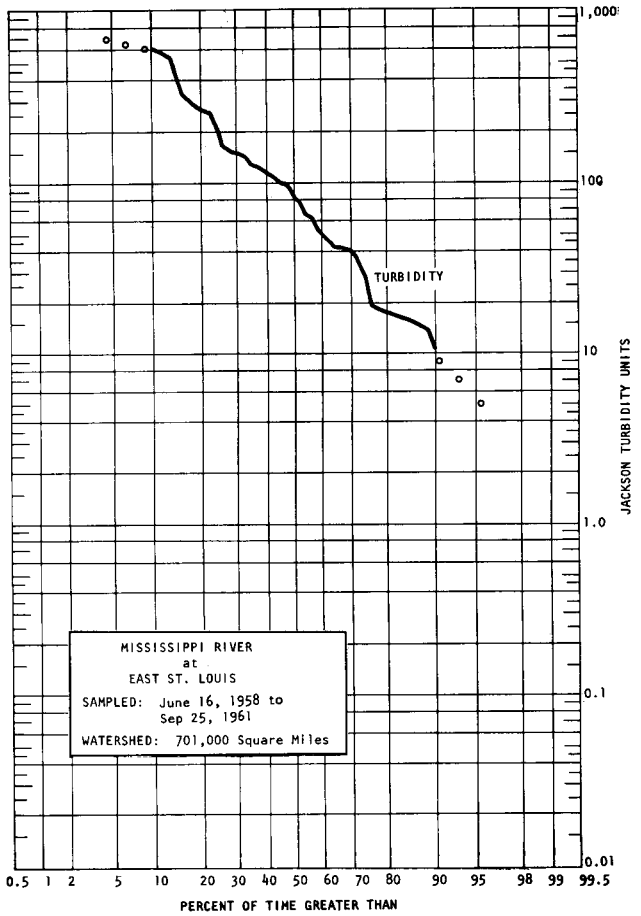
For 80 percent of the time, in the interval between 10 and 90 percent, turbidities did not exceed 600 Jtu (1958-1961) or 250 Jtu (1961-1966), and were not less than 15 Jtu (1958-1961 and 1961-1966). Median values were 90 Jtu (1958-1961) and 60 Jtu (1961-1966).

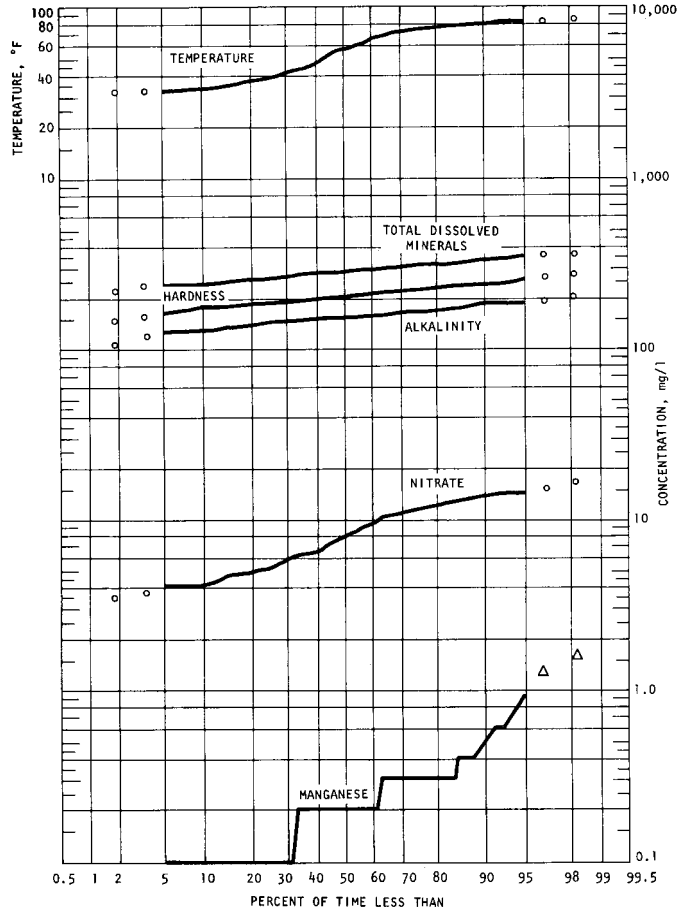
The reported temperatures were over 80 F for 10 (1958-1961) and 12 (1961-1966) percent of the time, and over 70 F for 39 (1958-1961) and 35 (1961-1966) percent of the time. They were below 50 F for 39 (1958-1961) and 40 (1961-1966) percent of the time, and below 40 F for 27 (1958-1961) and 26 (1961-1966) percent of the time.

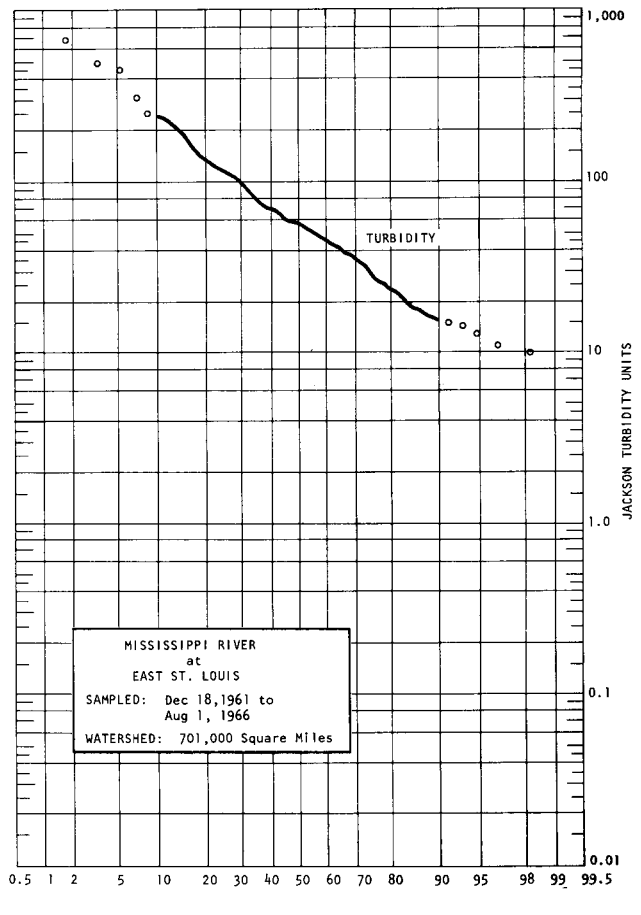
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1958-1961)	120	150	180
	(1961-1966)	130	155	185
Hardness (as $CaCO_3$)	(1958-1961)	155	200	240
	(1961-1966)	175	205	240
Total dissolved minerals	(1958-1961)	210	280	300
	(1961-1966)	245	285	345
Nitrate	(1958-1961)	2.4	6.0	11
	(1961-1966)	4.2	8.2	14
Manganese	(1958-1961)	T	0.2	0.5
	(1961-1966)	0.1	0.2	0.5


TEMPERATURE, °F
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
MISSISSIPPI RIVER
at
EAST ST. LOUIS
SAMPLED: June 16, 1958 to
Sep 25, 1961
WATERSHED: 701,000 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN


TEMPERATURE, °F
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
MISSISSIPPI RIVER
at
EAST ST. LOUIS
SAMPLED: Dec 18,1961 to
Aug 1, 1966
WATERSHED: 701,000 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1958																				
6-16		146868	73	1700	45.0	1.6	0.1	0.0	14.4	10	42.6	7.7	T	42.5	12.0	11	120	156	213	
7-7		147115	78.1	604	13.0	0.2	0.1	0.4	23.2	12	55.1	4.5	T	51.9	17.7	14	156	203	287	
8-4		147349	77.4	540	18.0	0.4	0.1	0.0	9.0	6	30.9	5.6	T	35.8	12.6	3	104	142	179	
9-8		147694	78.2	62	1.2	0.1	0.3	0.1	4.8	13	58.2	3.3	T	48.5	17.7	16	148	194	268	
10-6		147861	65.3	154	2.8	0.1	0.1	0.0	6.9	14	64.6	5.7	0.2	46.4	15.8	25	144	181	271	
11-3		148087	56.5	42	2.6	0.2	0.1	0.1	4.9	18	58.8	0.9	T	47.9	17.5	16	140	192	284	
12-1		148315			2.1	0.3	0.1	0.1	4.9	18	45.9	2.5	T	47.5	16.3	15	144	186	262	
1959																				
1-5		148581	33.4	17	0.5	0.1	0.1	0.0	6.4	24	58.9	1.5	T	52.7	19.2	20	164	211	299	
2-9		148810	35.2	15	1.3	0.1	0.1	0.0	5.6	21	47.1	2.3	0.1	50.5	16.1	18	152	192	281	
3-4		149005	36.8	151	7.8	0.3	0.1	0.1	7.5	15	39.9	4.1	T	31.8	13.7	12	96	136	209	
3-30		149210	44.8	600	22	1.1	0.1	0.0	5.7	18	65.4	14.0	T	74.6	29.5	6	216	308	370	
5-4		149489	62	127	6.1	0.4	0.3	0.0	4.7	13	65.8	6.9	T	56.0	18.5	9	144	216	281	
6-1		149782	73.9	700	23	0.7	0.4	0.0	9.6	14	59.2	5.7	T	53.0	17.4	14	148	204	295	
6- 22		149939	77.9	119	6.0	0.3	0.3	0.1	8.2	16	64.6	4.0	T	56.3	19.9	15	164	223	276	
8-3		150296	92.3	9	1.0	T	0.3	0.1	5.3	20	56.2	3.9	0.1	47.9	20.2	14	144	203	275	
8-24		150423	83.3	53	2.8	0.1	0.2	0.0	4.6	15	46.9	2.8	T	44.3	10.9	17	120	156	224	
9-21		150649	71.1	66	3.2	0.2	0.3	0.2	6.3	13	45.7	5.3	0.1	41.5	15.6	16	132	168	249	
11-9		150977	48.2	77	4.8	0.2	0.2	0.0	2.0	14	61.3	6.1	T	49.3	17.6	20	152	196	286	
11-23		151091	38.3	42	2.3	T	0.2	0.1	8.9	14	59.0	8.7	0.1	53.8	18.8	11	148	212	290	
12-28		151325	40.8	19	1.5	0.1	0.3	0.0	7.4	15	63.1	7.1	0.1	58.1	21.5	12	168	234	301	3.4
1960																				
1-8		151613	35	167	3.3	0.1	0.2	0.0	7.6	21	114.3	8.2	0.4	74.1	23.1	8	152	281	370	0.1
3-21		151895	33.7	47	0.9	0.1	0.2	0.0	9.8	20	64.4	8.9	T	62.0	22.3	18	184	247	327	0.4
4-4		151974	39.5	650	19	0.6	0.2	0.0	7.5	10	34.1	1.9	0.1	36.1	11.1	7	100	136	190	0.3
4-25		152180	59.9	270	7.7	0.3	0.2	0.0	11.2	12	57.8	11.9	T	52.4	18.0	12	144	205	279	0.3
5-31		152373	66.5	290	9.0	0.3	0.2	0.1	8.5	9	48.3	8.8	T	47.2	16.3	10	136	185	239	0.4
7-14		152866	76.3	84	3.6	0.2	0.2	0.1	7.9	10	57.4	10.2	T	58.4	21.4	9	172	234	287	0.4
7-25		152868	79.9	37	0.5	0.1	0.3	0.1	9.6	9	50.0	8.9	0.0	55.5	19.1	8	164	218	263	0.4
9-6		153183	83.1	28	1.9	0.1	0.1	0.1	3.0	12	46.7	4.3	T	51.8	20.8	12	172	215	274	0.3
10-10		153400	67.8	14	1.7	0.1	0.2	0.1	9.3	9	44.4	6.0	0.1	46.5	14.7	14	144	177	239	0.6
12-5		153730	43.7	5	0.7	0.1	0.1	0.2	5.4	13	49.4	6.8	T	51.1	19.0	15	164	206	262	0.4
1961																				
1-3		153934	33.7	7	1.5	0.0	0.3	0.1	5.7	15	50.6	4.0	T	53.9	20.7	15	176	220	286	0.2
1-9		153957	34.7	18	1.2	T	0.2	0.1	6.5	21	57.6	7.0	0.1	54.9	21.3	23	180	225	293	0.7

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
1-30		154100	33	16	2.6	0.1	0.3	0.1	6.2	18	55.5	7.6	0.1	55.5	20.9	22	184	225	296	0.5
2-27		154296	37.9	335	11	0.4	0.2	0.1	5.9	15	47.1	10.7	0.1	45.5	14.8	18	136	175	250	1.7
3-27		154448	48	145	6.8	0.2	0.3	0.1	7.1	15	59.9	14.9	0.1	54.8	18.0	15	148	211	292	0.6
5-1		154724	57	100	6.2	0.3	0.2	0.1	5.9	13	59.4	10.9	0.1	55.1	19.0	13	156	216	290	0.5
5-22		154868	64.9	112	4.3	0.2	0.2	0.1	3.9	12	60.3	9.6	T	53.2	20.2	11	152	216	285	0.3
6-26		155172	75	99	4.3	0.1	0.2	0.1	6.3	12	59.9	9.9	0.1	53.6	15.8	18	152	199	280	0.4
7-13		155364	82.9	260	8.1	0.3	0.2	0.0	6.3	8	40.9	4.5	0.2	40.8	13.9	8	120	159	195	0.4
8-28		155550	79	41	1.4	0.1	0.2	0.1	2.4	12	52.7	4.6	0.1	50.0	18.0	15	156	199	267	0.5
9-25		155709	72.9	129	6.1	0.3	0.2	0.1	8.4	13	50.6	8.2	0.1	45.0	15.2	14	128	175	250	0.5
12-18		156338	71.6	26	1.3	0.1	0.3	0.1	8.5	14	68.1	10.7	0.1	69.0	25.7	13	208	278	335	0.6
1962																				
2-5		156704	33.9	113	3.0	0.2	0.2	0.1	9.9	16	65.6	11.5	0.0	59.7	21.8	14	168	239	308	0.5
2-26		156870	37	59	2.8	0.1	0.2	0.1	9.6	15	64.6	11.6	T	56.0	21.9	13	160	230	307	0.4
3-19		157020	37	209	7.2	0.2	0.2	0.1	8.4	12	54.7	13.5	T	50.2	16.9	12	136	195	255	0.5
4-2		157113	46	122	5.0	0.2	0.2	0.1	9.4	4	47.7	14.7	T	46.0	16.3	6	128	182	239	0.3
4-30		157430	61.8	84	3.9	0.3	0.2	0.1	6.9	9	57.2	10.3	0.0	56.8	19.5	8	158	222	259	0.3
5-28		157682	74.8	70	3.4	0.1	0.2	0.1	5.7	11	64.2	9.1	0.1	58.8	21.4	11	170	235	297	0.4
6-25		157905	79.1	68	2.8	0.2	0.1	0.0	9.7	10	48.3	6.4	0.1	54.6	18.1	6	156	211	254	0.2
7-16		158127	83.8	46	2.0	0.1	0.3	0.1	7.7	13	52.7	7.3	0.0	51.4	17.6	14	152	201	271	0.4
9-17		158623	74.8	60	2.2	0.1	0.3	0.3	11.9	10	47.1	5.0	0.1	52.1	16.9	12	160	200	255	0.3
9-24		158686	68	53	2.6	0.1	0.3	0.1	11.5	12	43.8	4.2	0.1	53.1	17.6	12	164	203	280	0.3
10-22		158855	66.9	49	2.3	0.2	0.3	0.1	8.4	13	45.7	7.1	0.1	51.9	17.3	7	156	201	259	0.5
11-19		159045	49.8	18	0.8	0.1	0.4	0.1	7.4	16	49.6	4.1	0.1	53.2	19.5	15	168	213	280	0.5
1963																				
1-7		159314	34.8	15	0.7	0.1	0.3	0.1	2.0	15	54.7	5.0	0.1	57.1	20.2	20	188	226	312	0.5
1-21		159416	32.9	17	0.7	T	0.3	0.1	5.4	13	54.1	8.7	0.1	57.7	20.8	7	164	230	281	0.6
3-4		159707	34.8	22	0.9	0.2	0.3	0.0	11.1	24	58.2	12.8	0.1	58.3	18.2	22	164	221	343	1.4
3-25		159842	42.8	318	12	0.6	0.1	0.1	7.6	7	46.9	15.2	0.1	44.7	14.3	11	124	171	251	0.8
4-22		160053	61.8	38	1.5	0.2	0.2	0.1	1.7	14	44.6	7.7	0.1	44.9	16.4	14	140	180	238	0.3
6-10		160403	81.1	16	1.2	.10	0.2	0.1	1.8	13	53.3	6.1	0.1	45.6	17.0	18	144	184	256	0.4
7-17		160700	81.1	71	3.2	.31	0.4	0.2	5.5	18	93.6	5.3	0.1	53.0	17.9	34	152	206	321	0.5
7-22		160751	83.8	38	1.9	.26	0.3	0.1	4.4	14	50.4	6.3	0.1	48.8	15.8	14	140	187	251	0.5
8-27		161192	77	45	2.2	.23	0.4	0.2	3.2	14	51.6	4.8	0.1	49.6	16.1	9	134	190	238	0.6
9-23		161305	73.4	69	2.8	.26	0.4	0.1	5.4	18	99.4	4.4	0.1	75.9	18.6	9	154	216	333	0.7
10-28		161539	67.8	33	2.0	.19	0.4	0.1	5.0	18	102.4	3.6	0.1	58.5	19.2	34	164	225	345	0.7
11-20		161712	52	38	2.0	.20	0.4	0.2	5.3	21	123.4	3.4	T	58.9	21.8	40	164	237	368	0.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
1-8		161997	34.8	13	0.7	.14	0.5	0.1	4.4	25	79.8	4.7	0.1	61.0	20.3	32	184	236	361	0.7
1-27		162131	33.9	23	1.2	.30	0.3	0.3	3.3	24	59.2	9.2	0.1	54.2	20.6	23	168	220	291	1.2
3-9		162401	43.9	24	1.2	.20	0.4	0.0	2.7	33	66.0	9.0	T	46.4	19.7	32	144	197	297	1.3
4-6		162589	44.8	138	9.4	.39	0.4	0.1	2.5	23	62.7	9.3	0.4	49.0	17.6	26	148	195	294	0.5
4-22		162774	57.7	460	13	1.33	0.3	0.1	9.6	17	56.4	12.3	0.1	58.3	18.0	15	160	220	282	0.8
7-6		163416	81.1	256	12	.61	0.2	0.1	9.3	8	67.9	7.9	0.0	51.1	14.3	15	132	187	285	0.4
7-20		163560	82.9	692	6.8	1.63	0.2	0.1	9.1	13	79.8	6.2	0.1	51.1	14,2	35	156	186	312	0.5
8-3		163667	86	55	2.8	.22	0.5	0.2	7.5	22	123.8	4.8	T	58.4	18.0	42	150	220	361	0.7
9-8		164215	79.1	107	6.0	.36	0.3	0.1	4.6	18	67.5	5.0	T	47.8	16.2	30	152	186	302	0.1
9-23		164367	73.9	43	2.7	.20	0.2	0.0	3.2	14	36.8	6.3	T	45.5	15.4	19	156	177	245	0.5
11-4		164600	57.7	30	1.2	.16	0.4	0.1	2.4	19	69.7	4.0	0.1	45.4	19.3	21	124	192	289	0.4
12-9		164812	37.9	26	1.2	.14	0.6	0.1	3.3	23	94.4	11.1	T	51.5	16.4	40	144	196	317	1.0
1965																				
1-11		165023	37.9	183	8.3	.34	0.4	0.1	6.9	19	51.4	10.5	T	39.2	14.3	22	116	157	252	0.9
2-18		165243	32.9	11	0.3	.29	0.3	0.2	11.1	22	57.4	14.5	T	49.6	16.1	20	132	190	279	1.1
3-3		165374	37.9	70	4.2	.28	0.3	0.1	7.7	18	47.9	11.0	T	48.1	14.1	14	124	178	271	1.2
4-8		165666	45.9	500	22	.93	0.2	0.0	11.5	15	44.2	14.3	T	41.5	14.5	15	118	163	247	0.0
5-3		165888	56.6	102	5.0	.27	0.1	0.0	8.6	10	42.6	14.0	T	39.8	11.3	14	106	146	220	0.0
6-9		166269	72.9	242	12	.52	0.4	0.0	9.2	9	47.9	8.2	T	43.0	14.0	16	131	165	241	0.1
8-23		167055	79.1	18	1.2	.03	0.4	0.1	8.7	16	62.1	5.5	T	44.2	16.7	26	144	179	288	0.0
10-15		167411	60.1	119	4.1	.21	0.2	0.2	8.2	15	45.4	5.6	T	56.2	17.0	10	160	210	282	0.7
11-1		167542	53.8	143	5.8	.29	0.3	0.3	8.3	18	58.6	6.0	T	62.2	20.2	14	180	238	317	1.0
11-15		167695	52	42	0.5	.14	0.3	0.1	8.6	17	59.4	4.8	T	61.4	21.2	16	184	240	320	0.3
11-22		167694	42.8	59	0.7	.12	0.2	0.1	7.9	16	59.6	4.1	T	62.6	20.7	14	184	241	314	0.5
1966																				
1-3		168064	39	143	11	.29	0.3	0.1	9.7	19	58.6	14.0	0.0	50.5	20.4	16	146	210	301	0.7
2-7		168345	32.9	10	0.7	.11	0.2	0.1	11.1	19	62.7	11.6	0.0	63.8	24.6	17	196	260	342	0.5
3-7		168471	33.9	50	3.1	.13	0.1	0.1	9.3	18	50.6	8.3	T	47.9	18.9	16	148	197	267	0.6
3-28		168703	43.9	116	8.0	.27	0.1	0.1	8.3	19	56.8	11.4	0.0	52.5	19.7	15	150	212	307	0.5
4-25		168747	55.7	238	4.2	.30	0.3	0.1	7.4	15	52.3	10.4	T	47.0	14.5	16	128	177	262	0.5
6-8		169088	72	59	3.2	.17	0.3	0.1	7.1	16	74.3	16.7	0.0	66.0	24.0	10	172	263	346	0.5
6-27		169206	77.9	91	2.8	.16	0.5	0.1	8.1	14	53.1	12.1	0.0	58.0	18.4	12	160	220	285	0.4
8-1		169535	80	14	0.6	.09	0.4	0.2	7.1	18	43.6	6.8	0.1	51.9	19.1	9	152	208	259	0.5

NORTH FORK EMBARRAS RIVER NEAR OBLONG

The North Fork Embarras River rises in the Springfield Plain Region southeast of Charleston and flows southerly to its junction with the Embarras River southeast of Ste. Marie. The gaging station is 2 miles west of Oblong, and the elevation of the gage datum is 456.19 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 319 square miles.

The tabulation of water quality data is for the period from October 19, 1961, to September 23, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1961-1966 were considerably lower than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 7.25 inches above normal to 12.17 inches below normal, based on records for three stations within the drainage basin. The average annual departure was –4.02 inches.

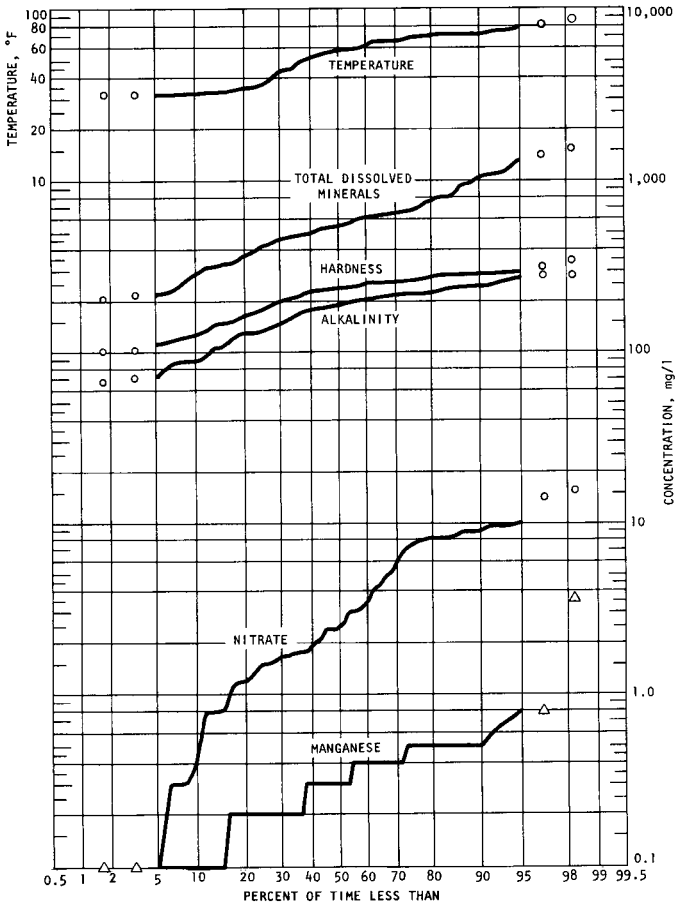
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.47 cfs/sq mi and was not less than 0.002 cfs/sq mi, with a median flow of 0.047 cfs/sq mi. The minimum average daily flow of record was 0 cfs in September 1953 and July-September 1954.

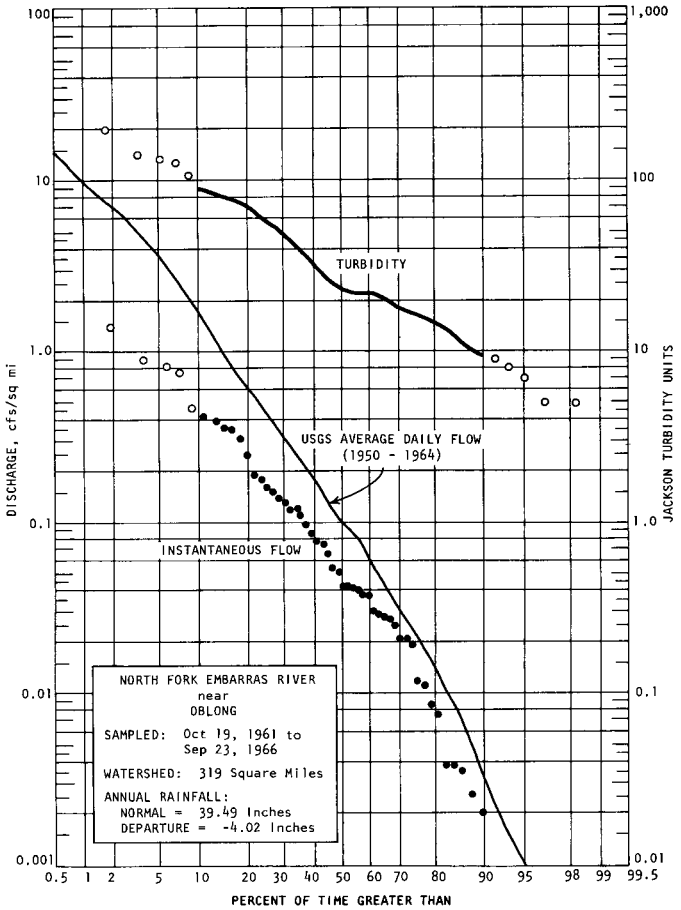
The turbidity was not less than 9 Jtu nor more than 90 Jtu for the central 80 percent of the time, with a median value of 25 Jtu.

Reported temperatures were over 80 F for 3 percent and over 70 F for 20 percent of the time. They were below 50 F for 35 percent and below 40 F for 27 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	90	190	245
Hardness (as $CaCO_3$)	125	240	295
Total dissolved minerals	290	560	1020
Nitrate	0.4	2.5	9
Manganese	0.1	0.3	0.5





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-19	5.9	156029	56.5	18	1.3	0.2	0.2	0.1	7.4	235	22.4	2.1	0.1	67.7	21.0	149	224	256	660	0.2
11-14	16.4	156152	45	18	1.2	0.2	0.2	0.1	8.9	230	41.8	1.8	0.1	62.5	20.6	147	192	241	639	0.2
12-21	640.0*	156336	36	58	2.5	0.1	0.2	0.0	8.9	35	41.1	14.3	0.1	33.4	9.4	25	72	122	210	0.3
1962																				
1-23	250.0*	156615	32.3	26	0.5	0.1	0.2	0.1	7.4	68	52.9	6.8	T	48.5	17.1	44	132	192	323	0.1
2-6	436.0	156703	33	88	3.8	0.3	0.2	0.0	6.9	29	45.7	9.0	0.0	38.5	13.3	19	96	151	225	0.3
3-20	143.0	157008	48	16	1.0	0.1	0.1	0.1	9.0	80	61.5	7.4	T	62.2	22.0	54	180	246	429	0.1
4-26	56.9	157342	66.5	22	1.6	0.3	0.2	0.1	2.8	125	61.7	3.0	T	65.7	24.7	81	200	266	499	0.1
5-24	26.1	157616	66	53	2.5	0.5	0.1	0.2	9.9	114	39.1	8.0	0.1	69.3	17.5	74	204	245	482	0.2
6-28	23.5	157916	76	23	1.7	0.4	0.1	0.1	8.4	320	31.5	1.5	0.1	62.8	21.4	204	204	245	781	0.1
7-26	15.1	158260	73.5	109	4.6	0.3	0.1	0.1	6.5	102	23.4	4.4	0.1	40.9	10.7	71	128	146	346	0.3
8-29	22.9	158480	73	80	3.7	0.4	0.2	0.1	6.1	290	15.6	1.1	T	35.2	9.2	179	88	126	606	0.1
9-28	6.3	158687	57.5	28	1.6	0.2	0.2	0.1	5.3	200	18.1	1.4	0.2	58.4	15.8	130	192	211	546	0.1
10-12	7.7	158845	60	41	2.6	0.5	0.1	0.1	6.3	116	22.0	3.2	0.1	45.1	12.9	84	160	166	386	0.3
11-15	12.5	159023	46	10	1.1	0.1	0.2	0.2	4.8	455	26.1	0.8	0.1	66.1	23.2	290	224	261	1020	0.1
12-20	8.3	159249	32.5	5	0.9	0.2	0.1	0.1	3.1	480	34.8	0.8	T	77.0	30.5	307	272	318	1124	0.1
1963																				
1-25	3.3	159417	31.8	5	0.8	0.1	0.3	0.1	3.7	425	48.8	1.3	T	86.9	31.7	275	288	348	1086	0.0
2-21	8.7	159620	32	7	0.8	0.4	0.2	0.1	1.6	410	42.4	5.1	T	61.1	24.3	265	204	253	956	0.1
3-22	248.0	159808	44	83	2.2	0.3	0.1	0.1	8.4	58	43.4	8.8	0.1	50.4	17.5	37	144	198	338	0.2
4-26	45.1	160087	58	17	0.8	0.3	0.2	0.1	5.2	145	49.8	2.5	0.1	66.6	23.2	98	216	262	521	0.5
5-23	48.0	160252	60	22	1.7	0.3	0.2	0.0	8.7	134	52.0	4.1	0.1	60.1	20.8	95	192	236	510	0.2
6-14	11.7	160401	71	33	4.0	.48	0.2	0.1	5.7	200	28.8	3.1	0.1	63.1	23.2	133	228	253	612	0.3
7-12	12.1	160619	70	129	4.7	.47	0.2	0.0	8.2	95	23.9	4.0	0.1	38.5	9.4	81	120	135	339	0.2
8-1	13.2	160846	74	55	2.4	.53	0.3	0.1	6.5	330	25.3	1.7	T	68.3	20.3	213	224	254	808	0.3
9-20	1.2	161309	74	86	4.3	.82	0.1	0.1	3.4	710	26.9	1.7	0.1	66.3	30.2	443	224	290	1443	0.4
10-17	0.1	161440	63	22	1.5	.54	0.3	0.2	4.7	320	25.5	2.4	0.1	64.0	21.8	217	244	250	800	0.4
11-8	1.1	161649	53	41	2.4	.66	0.3	0.1	6.6	255	13.8	1.7	0.1	60.0	18.7	174	230	227	568	0.2
12-18	1.2	161882	33.5	8	1.3	.20	0.2	0.2	5.6	630	36.2	0.3	0.1	75.0	26.6	415	276	297	1366	0.5
1964																				
1-22	229.0	162070	33	77	3.8	.42	0.1	0.1	5.1	58	29.0	9.7	0.1	26.4	9.4	38	68	104	221	0.6
2-11	35.1	162230	34.5	19	1.1	.17	0.2	0.0	7.6	134	63.6	9.7	T	58.4	20.2	84	148	229	499	0.2
3-18	119.0	162456	45	12	1.3	.19	0.2	0.1	9.2	90	60.9	10.1	0.1	61.1	18.7	57	156	230	395	0.1
4-14	129.0	162692	59	21	1.2	.26	0.2	0.2	9.3	113	60.9	5.0	T	68.0	23.1	73	196	265	509	0.0
5-6	72.0	162846	69	20	1.9	.16	0.2	0.1	7.4	122	52.9	1.8	T	73.6	24.6	75	220	285	489	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
6-4	11.6	163103	66	22	1.0	.44	0.2	0.1	5.2	225	33.1	0.1	0.1	74.5	26.3	152	256	299	682	0.0
7-6	2.6	163480	74	49	2.6	.80	0.1	0.1	5.1	320	24.9	2.4	0.1	67.3	25.5	205	240	274	809	0.3
8-3	0.8	163669	89	23	1.2	.50	0.2	0.1	4.2	175	23.9	1.6	T	56.5	16.8	127	212	210	542	0.3
9-10	0.1	164217	80	33	1.3	.63	0.2	0.1	3.3	48	17.1	2.6	T	27.0	7.9	43	108	100	228	1.1
10-16	0.0	164498	62	16	1.2	.39	0.2	0.1	1.6	155	17.3	1.5	0.1	47.9	16.2	110	188	186	478	0.2
11-9	0.1	164661	55	40	0.6	3.60	0.2	0.1	6.6	210	14.8	1.2	0.1	59.7	20.4	149	244	233	606	0.2
12-7	6.4	164817	34	136	8.1	.41	0.3	0.1	5.2	265	31.5	3.0	0.1	45.6	12.9	172	132	167	645	0.1
1965																				
1-11	9.2	165086	35	16	0.9	.12	0.3	0.1	2.7	256	64.0	3.4	0.1	60.7	19.1	175	180	230	688	0.0
2-8	30.0*	165224	38	11	0.7	.10	0.0	0.1	5.1	215	124.4	7.5	T	68.0	23.7	119	88	267	606	0.1
3-25	106.0	165464	37	14	0.7	.18	0.2	0.1	5.3	128	73.6	8.0	0.0	74.4	27.5	78	204	298	559	0.5
4-20	108.0	165791	59	28	1.3	.21	0.2	0.0	6.6	86	63.8	8.1	0.0	62.8	21.0	59	176	243	443	1.1
5-21	43.8	165986	68	39	2.5	.37	0.1	0.1	4.3	180	51.8	1.8	0.0	74.6	26.6	117	240	296	597	0.7
6-18	13.0	166326	68	33	1.6	.49	0.2	0.0	4.8	170	39.7	0.3	0.0	63.1	22.1	115	216	249	549	0.8
7-15	20.5	166648	77	67	3.2	.41	0.2	0.2	8.9	44	27.4	7.9	0.0	47.2	13.6	35	148	174	318	2.7
8																				
9-15	33.9	167213	70	75	3.6	.51	0.1	0.0	4.1	330	18.1	2.4	0.0	28.0	10.7	208	74	114	652	4.2
10-5	8.5	167333	55	14	1.0	.17	0.2	0.1	4.6	255	28.4	0.0	0.0	51.2	17.5	164	162	200	636	2.9
11-1	0.6	167501	51	23	1.7	.46	0.1	0.1	2.8	425	29.0	0.8	T	68.5	24.8	265	220	273	974	0.1
12-7	3.5	167822	36	21	1.8	.15	0.2	0.2	3.8	315	36.8	0.0	0.0	51.2	19.5	222	204	208	791	1.8
1966																				
1-10	39.1	168101	33	9	0.2	.11	0.1	0.1	8.9	154	66.2	6.1	0.1	74.0	27.6	96	216	298	578	0.0
2-15	94.0	168294	36	14	0.7	.12	0.2	0.1	8.6	118	61.3	15.2	T	56.0	19.1	72	132	218	460	0.4
3-21	37.6	168595	53	9	0.5	.20	0.2	0.1	1.5	196	68.9	0.4	T	65.2	26.1	123	188	270	612	0.2
4-29	5.0*	169041	60	198	8.7	.30	0.1	0.1	11.6	35	40.7	8.1	T	41.2	11.4	26	108	150	257	0.2
5-23	274.0	169034	67	144	14	.27	0.1	0.1	8.1	48	40.8	8.0	T	50.0	12.7	35	136	177	291	0.3
6-21	29.9	169166	75	67	2.6	.28	0.1	0.1	9.9	106	34.8	8.9	0.0	64.0	18.4	93	180	235	435	0.2
7-29	2.3	169495	84	25	1.1	.43	0.1	0.1	3.0	240	24.3	1.2	0.1	73.0	27.5	148	252	295	694	0.3
8-26	0.0*	169695	70	22	0.5	.45	0.2	0.1	1.1	730	24.7	2.0	0.2	69.8	28.2	459	232	290	1506	0.1
9-23	53.4	169928	61	69	3.8	.35	0.1	0.1	7.6	128	30.7	1.9	T	34.4	9.5	80	84	125	379	0.3

*USGS average daily discharge

OHIO RIVER AT CAIRO

The Ohio River is an intersectional stream, rising in Pennsylvania and flowing along the southeastern border of Illinois. The drainage area at Cairo is approximately 203,900 square miles.

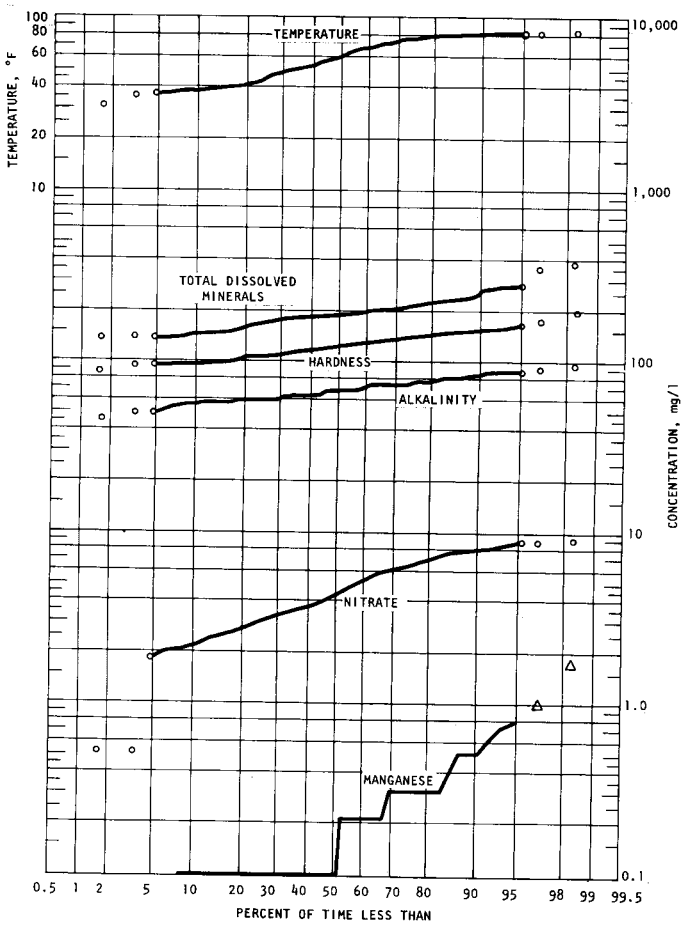
Tabulations of water quality data for samples collected by the Cairo Water Company are for the periods from May 27, 1958, to November 15, 1961, and from December 26, 1961, to September 27, 1966. Quality data are also summarized graphically.

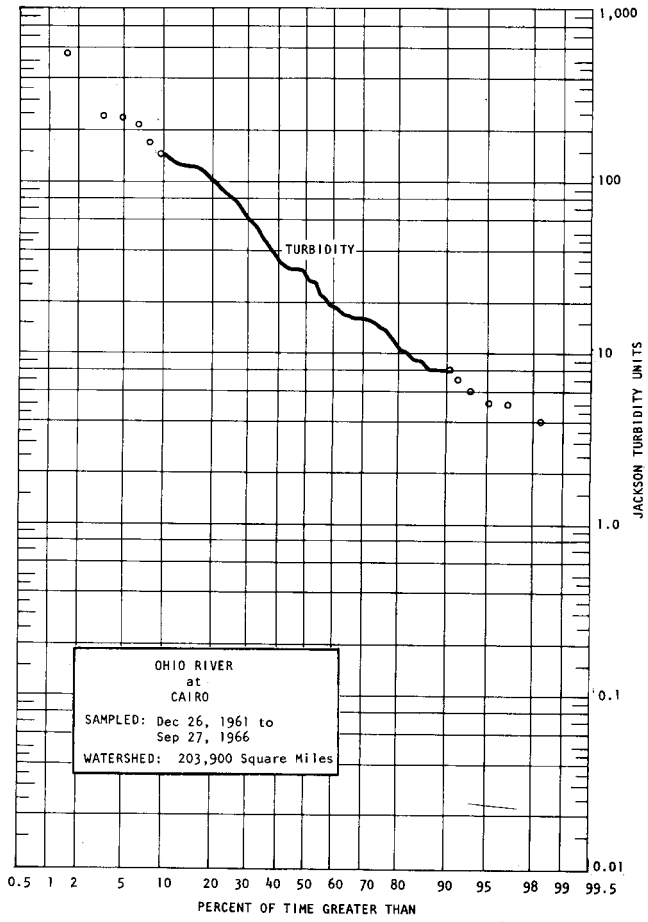
For 80 percent of the time, in the interval between 10 and 90 percent, turbidities did not exceed 120 Jtu (1958-1961) or 150 Jtu (1961-1966), and were not less than 9 Jtu (1958-1961) or 8 Jtu (1961-1966). Median values were 45 Jtu (1958-1961) and 30 Jtu (1961-1966).

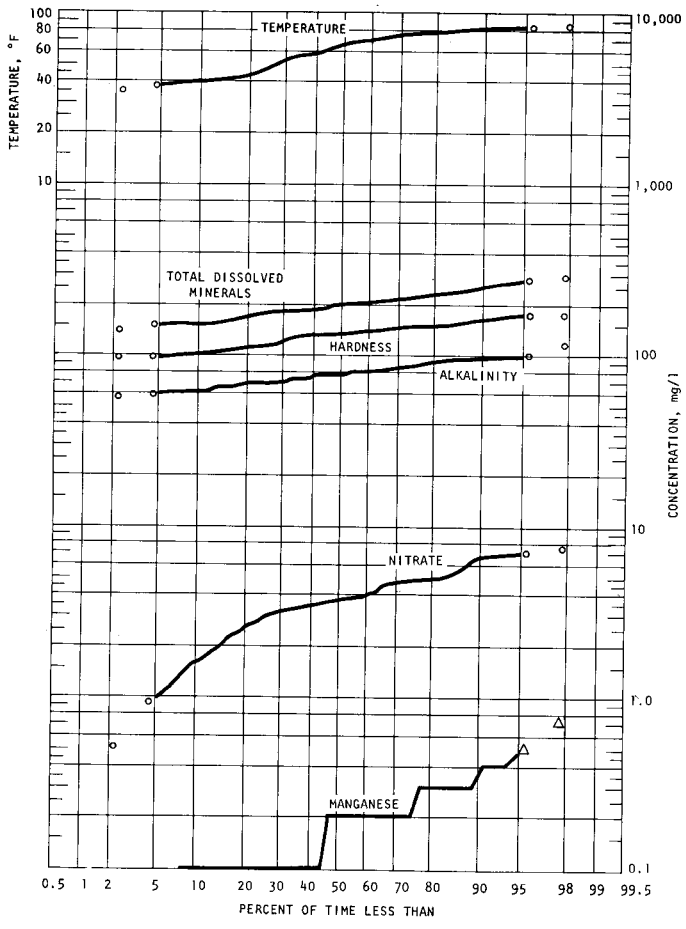
Reported temperatures were over 80 F for 19 (1958-1961) and 16 (1961-1966) percent of the time, and over 70 F for 42 (1958-1961) and 38 (1961-1966) percent of the time. They were below 50 F for 23 (1958-1961) and 30 (1961-1966) percent of the time, and below 40 F for 12 (1958-1961) and 13 (1961-1966) percent of the time.

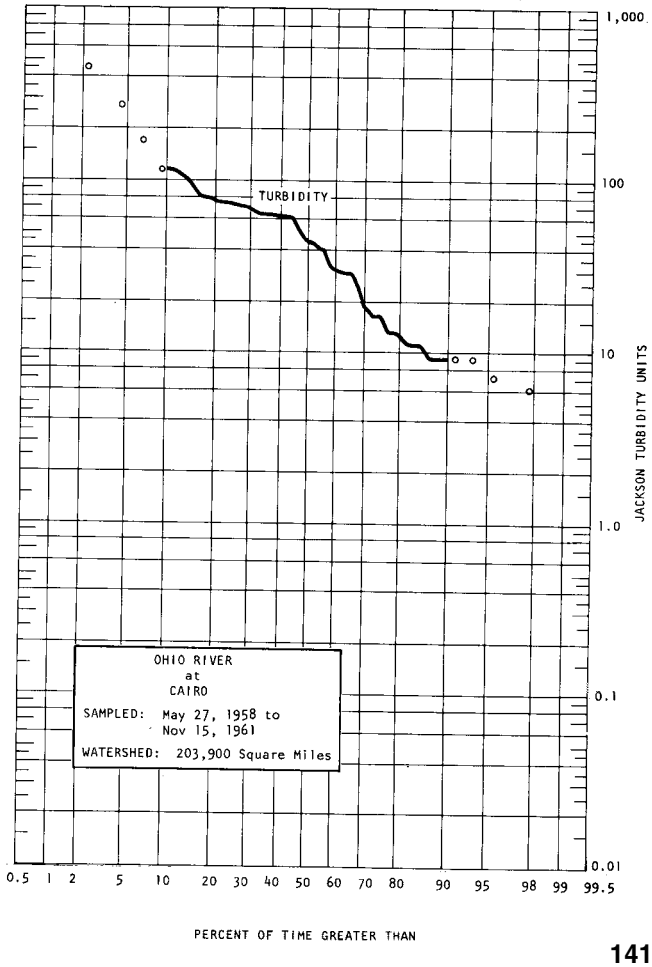
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1958-1961)	60	75	95
	(1961-1966)	55	70	85
Hardness (as $CaCO_3$)	(1958-1961)	100	135	160
	(1961-1966)	95	120	150
Total dissolved minerals	(1958-1961)	150	200	250
	(1961-1966)	140	185	260
Nitrate	(1958-1961)	1.6	3.8	6.6
	(1961-1966)	2.1	4.3	8.0
Manganese	(1958-1961)	0.1	0.2	0.3
	(1961-1966)	0.1	0.1	0.5


TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
OHIO RIVER
at
CAIRO
SAMPLED: Dec 26, 1961 to
Sep 27, 1966
WATERSHED: 203,900 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN


TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
OHIO RIVER
at
CAIRO
SAMPLED: May 27, 1958 to
Nov 15, 1961
WATERSHED: 203,900 Square Miles
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature ^0F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
5-27	26.4	146733	70.5	170	5.1	0.4	0.1	0.0	7.6	11	54.7	4.8	0.1	38.0	9.4	12	84	134	203	
6-23	29.0	146910	75.9	400	11.0	0.3	0.1	0.1	7.2	13	44.2	4.6	T	45.7	9.8	4	96	155	211	
7-21	38.9	147237	80.6	71	3.7	0.2	0.2	0.0	7.1	16	49.2	3.4	T	37.5	9.3	9	76	132	180	
8-19	27.0	147471	80.6	73	4.7	0.2	0.2	0.1	7.8	12	51.4	3.7	T	41.0	10.9	8	92	148	191	
9-30	17.3	147810	73.4	43	1.6	0.1	0.2	0.0	3.5	24	63.8	3.5	T	44.0	9.7	21	92	150	242	
10-28	10.1	148040	62.6	6	0.7	0.1	0.1	0.1	4.7	23	49.4	0.9	T	39.2	8.5	13	76	133	205	
11-24		148312	56.8	29	2.6	0.1	0.1	0.1	3.9	32	67.5	4.0	T	49.7	12.5	17	96	176	281	
12-30	10.4	148559	39.4	9	1.2	0.2	0.1	0.0	6.6	25	73.2	2.9	T	49.7	13.0	24	116	178	269	
1959																				
2-10	28.8	148809	37.4	270	19.0	0.7	0.1	0.1	6.6	14	46.9	1.6	0.1	36.3	10.0	8	80	132	174	
3-10	30.7	149046	44.2	70	5.4	0.3	0.1	0.1	7.4	17	62.3	0.5	T	47.5	10.5	13	100	162	233	
4-6	31.1	149256	55.0	63	5.8	0.3	0.1	0.0	6.6	17	64.4	3.8	T	46.0	11.9	10	92	164	222	
4-28	28.6	149423	59.2	79	6.0	0.4	0.1	0.0	6.3	13	48.1	3.0	T	38.2	8.6	9	80	131	189	
5-25	27.3	149736	70.2	62	5.0	0.2	0.3	T	24.5	20	63.4	2.6	T	40.4	11.4	17	90	148	252	
6-22	13.9	149938	79.11	30	1.8	0.1	0.1	T	2.7	15	39.7	2.2	T	36.0	10.2	11	86	126	176	
7-20	14.4	150091	83.8	9	1.5	0.1	0.1	0.1	1.4	16	36.0	1.1	T	31.2	7.3	16	82	108	181	
8-24	12.6	150422	86.0	11	0.9	0.1	0.1	0.0	3.0	20	39.3	1.5	T	30.5	5.7	12	56	100	167	
9-28	11.1	150704	77.0	16	0.9	0.1	0.3	0.0	3.0	20	29.8	5.1	T	28.5	6.4	12	60	98	137	
10-26	14.3	150860	63.3	16	1.0	T	0.2	0.0	3.5	23	38.5	3.3	0.1	32.2	5.5	18	68	103	182	
12-1	21.4	151095	43.9	61	6.2	0.3	0.2	0.0	5.9	41	88.2	5.5	0.1	49.2	11.7	23	68	171	291	
1960																				
1-11	27.1	151421	41.3	59	7.3	0.5	0.2	0.0	7.4	22	69.5	4.8	T	41.9	10.0	17	76	146	225	0.1
2-3	24.5	151607	39.5	116	6.7	0.2	0.2	0.0	8.1	19	67.9	4.9	T	41.0	11.3	15	80	149	218	0.1
3-21	25.8	151896	39.2	63	4.0	0.3	0.2	0.0	5.7	20	63.1	4.7	T	40.9	10.3	15	80	145	213	0.0
4-5	43.0	151973	50.4	100	3.9	0.1	0.2	0.0	5.9	17	57.6	3.7	T	38.6	9.8	14	80	137	207	0.1
4-25	35.5	152179	64.4	39	1.1	T	0.2	0.0	5.0	16	55.3	4.9	T	36.3	9.5	12	72	130	183	0.0
5-21	32.4	152303	68.3	19	2.0	T	0.3	0.0	7.1	21	87.8	4.5	T	37.9	11.1	17	58	141	235	0.6
6-27	29.5	152616	78.8	111	3.0	0.2	0.2	0.0	4.7	19	62.1	2.6	T	42.8	9.5	14	84	146	213	0.1
7-25	15.8	152867	83.3	45	2.5	0.2	0.2	0.1	5.1	10	31.9	6.3	T	37.2	7.5	7	88	124	166	0.2
8-29	14.7	153131	84.2	11	1.0	0.1	0.2	0.0	1.8	18	42.4	3.2	T	31.0	7.9	14	64	105	150	0.2
9-26	13.9	153297	78.8	7	1.0	0.1	0.3	0.1	3.9	18	37.0	3.5	T	27.5	6.1	15	60	94	154	0.2
10-24	11.4	153495	66.2	13	0.9	0.1	0.3	0.1	1.0	15	37.0	3.3	T	28.8	5.7	15	66	95	149	0.2
11-28	12.2	153707	55.4	9	0.7	0.1	0.2	0.2	3.4	23	39.0	1.8	T	32.8	7.1	17	64	111	180	0.1
1961																				
1-16	13.0	154013	40.6	74	3.4	0.2	0.2	0.1	3.7	27	63.1	3.8	0.1	40.1	7.7	21	72	132	222	0.0
1-31	12.0	154130	34.8	41	3.3	0.2	0.2	0.0	5.1	20	52.7	4.7	T	35.2	6.3	15	60	114	190	0.2
2-20	21.2	154276	43.2	67	1.4	0.3	0.3	0.1	5.9	31	76.3	7.0	T	42.4	10.2	22	68	148	257	0.2
4-3	41.9	154527	50.0	51	4.6	0.2	0.2	0.0	6.4	13	60.5	7.4	0.1	40.1	9.6	14	84	140	210	0.2

Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		^{0}F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
5-1	39.8	154750	58.4	61	3.8	0.2	0.2	0.0	6.0	14	54.1	6.8	T	38.3	8.8	12	76	132	202	0.2
6-2	25.9	154949	68.0	32	2.1	0.1	0.2	0.0	4.5	12	59.5	3.3	0.1	43.0	8.4	14	92	142	213	0.1
7-3	17.6	155222	78.8	29	2.0	0.1	0.1	0.0	4.3	8	39.9	4.0	T	34.0	6.8	9	76	113	163	0.1
7-31	24.3	155363	82.8	80	4.6	0.2	0.3	0.1	4.8	18	67.9	3.8	T	39.1	9.5	15	71	137	230	0.1
9-5	13.7	155606	80.2	9	0.9	0.1	0.2	0.0	3.9	10	39.7	2.3	0.1	30.4	6.8	10	68	104	150	0.2
10-9	18.4	155840	70.2	24	0.7	0.1	0.2	0.1	3.0	14	35.4	3.2	T	32.8	7.1	9	72	111	150	0.2
11-15	20.1	156143	56.8	13	1.1	0.2	0.2	0.1	3.3	31	62.7	6.5	T	40.8	9.0	20	68	139	210	0.1
12-26	36.8	156351	42.4	169	10.0	0.5	0.2	0.1	6.2	13	39.1	4.9	0.0	32.5	7.6	10	72	113	180	0.1
1962																				
2-11	36.6	156782	38.3	141	8.9	0.3	0.2	0.1	6.2	15	59.2	7.8	T	39.7	10.1	13	80	141	208	0.1
3-14	50.1	156955	43.2	138	5.8	0.2	0.2	0.0	5.7	8	41.6	6.2	T	27.6	6.6	7	52	96	134	0.1
4-23	45.8	157328	54.3	103	5.9	0.3	0.2	0.0	6.1	9	47.9	4.3	T	30.2	7.4	7	56	106	146	0.1
5-14	25.2	157527	73.4	32	2.8	0.1	0.2	0.0	5.0	16	64.2	4.6	T	42.0	11.2	14	88	151	236	0.1
5-29	20.6	157683	79.5	32	1.4	T	0.2	0.0	2.1	14	53.1	4.0	T	40.7	9.2	10	85	140	195	0.1
6-26	20.5	157906	80.2	35	1.9	0.1	0.2	0.0	3.2	19	44.6	4.6	T	36.8	8.8	15	84	128	197	0.1
7-13	19.5	158126	82.4	19	1.6	0.2	0.2	0.1	2.1	26	72.0	3.3	T	40.0	10.2	20	72	142	227	0.1
8-27	12.4	158469	82.4	17	1.2	T	0.2	0.1	4.1	12	33.1	2.1	0.1	26.6	6.9	10	64	95	131	0.1
10-22	14.8	158854	69.4	13	1.1	0.1	0.2	0.1	4.0	21	43.8	3.7	0.1	32.1	6.9	15	64	109	168	0.1
11-19	21.4	159046	52.1	213	9.7	1.0	0.2	0.1	5.4	53	120.3	9.0	T	58.2	11.1	38	68	191	365	0.2
12-5	13.7	159136	51.1	16	1.6	0.1	0.3	0.0	5.4	21	36.2	3.8	T	31.2	5.4	14	60	100	163	0.2
1963																				
1-14	15.4	159352	37.4	64	3.9	0.3	0.4	0.0	5.6	19	55.5	6.0	T	34.0	7.5	17	64	116	193	0.1
1-28	13.3	159428	33.0	59	3.2	0.1	0.3	0.0	5.4	18	52.9	6.6	T	33.0	6.7	17	60	110	176	0.1
2-25	15.5	159628	39.0	48	3.8	0.3	0.3	0.1	5.3	17	54.3	3.9	T	34.6	7.7	17	72	118	187	0.1
3-28	51.0	159882	50.0	566	33.0	1.7	0.2	0.1	6.1	12	44.0	7.7	0.1	32.1	6.9	11	64	109	166	0.1
4-22	17.0	160030	65.3	32	2.4	0.2	0.2	0.0	5.2	14	54.9	7.6	0.1	43.0	9.6	14	96	147	221	0.0
5-29	22.5	160308	69.8	29	2.3	0.2	0.2	0.0	3.0	15	49.4	6.7	0.1	36.6	7.4	16	80	122	191	0.2
7-5	14.7	160589	84.0	14	1.3	.11	0.2	0.1	1.5	16	46.1	4.3	0.1	32.1	7.2	14	68	110	176	0.1
7-29	14.9	160830	84.2	16	1.0	.07	0.2	0.0	1.8	13	39.3	2.6	0.1	29.4	5.5	11	60	96	136	0.2
8-29	11.5	161135	82.0	27	3.5	.22	0.2	0.1	2.1	14	37.6	2.6	T	31.3	7.2	7	62	108	138	0.2
9-30	8.1	161339	71.6	7	1.1	.11	0.2	0.0	3.1	14	38.7	3.7	0.1	29.4	5.0	10	54	94	142	0.3
10-28	7.8	161528	70.7	8	0.5	.07	0.2	0.1	3.3	16	30.0	2.8	0.1	29.4	4.5	13	64	92	133	0.3
11-26	9.7	161718	55.4	5	0.3	.05	0.3	0.3	2.4	26	52.2	3.4	T	35.2	7.1	18	62	117	180	0.1
1964																				
1-2	6.0	161951	35.2	10	1.0	.09	0.4	0.1	3.7	43	61.3	3.6	0.1	41.0	6.9	24	56	131	226	0.0
1-29	20.1	162132	38.8	86	6.6	.52	0.2	0.1	4.8	29	67.7	7.4	0.1	36.8	8.0	21	54	125	205	0.6
2-25	19.7	162343	38.3	55	4.1	.31	0.2	0.0	5.4	26	63.4	6.3	T	35.2	6.6	19	48	115	188	0.0
3-25	48.1	162497	47.5	81	5.2	.26	0.2	0.0	6.5	11	43.8	8.0	T	26.5	4.9	12	44	86	146	0.1

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
4-28	40.2	162785	61.7	234	14.0	.50	0.2	0.0	5.3	13	50.6	6.2	T	41.3	9.0	6	76	140	205	0.1
5-27	16.3	163069	76.1	32	1.8	.16	0.2	0.1	2.8	15	46.9	2.5	0.1	36.5	7.9	9	72	124	155	0.0
6-29	22.9	163301	73.2	36	1.9	.10	0.2	0.1	2.9	20	59.2	2.5	T	39.6	9.0	13	72	136	187	0.1
7-27	12.0	163598	85.1	15	1.9	.13	0.2	0.1	2.3	19	47.1	2.4	0.1	32.8	9.2	11	68	120	161	0.0
8-26	10.3	164165	78.8	6	0.5	.04	0.3	0.1	1.8	23	53.5	2.2	T	32.6	7.2	19	68	111	192	0.4
9-23	10.7	164342	77.4	8	0.5	.05	0.1	0.1	2.7	22	41.8	3.0	T	28.2	6.9	17	60	99	177	0.1
10-26	11.5	164548	59.9	12	0.8	.14	0.2	0.1	2.5	26	44.4	3.1	0.1	34.0	5.4	17	60	107	184	0.2
11-30	17.8	164763	49.3	38	2.7	.26	0.2	0.1	2.2	53	97.1	8.9	T	53.3	9.5	68	72	172	356	0.0
12-21	23.1	164921	42.3	124	4.0	.76	0.2	0.2	4.8	28	95.0	8.9	T	46.2	7.5	59	64	146	281	0.0
1965																				
1-26	18.9	165118	41.3	122	7.2	.33	0.3	0.2	6.3	13	56.0	4.6	T	32.2	7.4	13	60	111	179	0.1
2-18	40.0	165242	41.3	248	2.0	.72	0.2	0.1	6.9	19	54.9	8.3	T	38.0	8.5	16	74	130	204	0.2
3-29	36.4	165511	44.6	115	9.7	.32	0.2	0.1	6.1	19	62.3	6.9	T	38.7	8.6	15	68	132	210	0.1
4-22	46.0	165772	59.0	100	7.4	.31	0.2	0.1	6.6	12	55.3	8.0	T	37.2	8.8	15	80	129	197	0.1
5-17	28.6	165954	72.0	16	0.9	.07	0.2	0.3	5.6	13	50.0	5.9	0.1	38.9	9.5	13	90	136	196	0.1
5-26	21.8	166074	76.1	16	1.3	.07	0.2	0.1	1.7	13	47.3	3.2	T	35.2	8.8	16	88	124	181	0.0
6-22	20.9	166330	78.8	19	1.2	.10	0.2	0.1	3.6	12	31.9	2.9	T	27.2	6.8	13	72	96	146	0.1
7-26	22.5	166794	84.2	18	1.6	.09	0.2	0.0	2.3	16	36.8	2.0	T	30.4	7.8	15	72	108	163	4.1
9-2	15.1	167107	77.0	10	1.1	.09	0.2	0.0	3.3	16	32.7	0.5	0.0	27.6	7.1	17	66	98	154	4.8
10-11	22.6	167358	66.2	17	1.2	.11	0.2	0.1	2.8	29	53.7	1.8	0.0	37.6	9.7	19	76	134	202	0.6
11-1	16.9	167533	59.9	27	2.1	.16	0.3	0.1	4.0	39	78.8	5.4	0.0	44.0	10.2	27	68	152	268	1.2
11-29	16.6	167731	53.6	21	1.0	.08	0.3	0.1	3.5	42	87.2	5.3	0.0	46.4	11.7	28	70	164	284	1.0
1966																				
1-3	25.4	168063	49.1	73	4.0	.35	0.5	0.2	5.5	32	79.2	5.8	0.1	42.6	11.8	26	80	155	261	0.4
2-25	40.5	168447	38.3	122	9.7	.62	0.3	0.1	5.9	18	60.5	7.2	T	30.6	7.7	16	48	108	181	0.2
3-21	23.6	168550	51.8	50	3.4	.24	0.2	0.2	6.3	25	80.4	6.1	T	43.9	11.1	23	80	155	237	0.3
4-4	20.6	168659	51.8	9	0.8	.13	0.3	0.2	4.3	25	78.2	5.1	T	41.9	10.6	23	76	148	228	0.0
4-25	32.4	168746	57.2	38	3.0	.15	0.3	0.1	6.1	23	60.7	3.7	0.1	31.9	7.9	20	56	112	203	0.1
5-24	36.1	169029	66.2	79	5.2	.23	0.5	0.1	6.1	16	53.3	6.0	0.0	36.5	8.5	12	68	126	197	0.2
6-28	15.0	169202	83.3	8	0.7	.07	0.5	0.1	1.6	17	50.0	2.4	0.0	35.0	11.3	9	76	134	187	0.1
7-25	13.2	169440	82.6	5	0.4	.11	0.3	0.1	2.2	21	50.8	2.0	T	34.8	7.8	12	60	119	181	0.2
8-25	15.1	169700	79.7	9	0.6	.07	0.4	0.0	2.0	28	59.7	3.0	0.0	36.8	8.3	16	56	126	221	0.1
9-27	13.2	169971	69.8	4	0.4	.03	0.2	0.1	1.8	35	75.1	0.5	0.1	45.2	9.0	21	68	150	234	0.1

OTTER CREEK NEAR PALMYRA

Otter Creek rises in the Springfield Plain Region north of Carlinville and flows southwesterly to its junction with Macoupin Creek. The gaging station is 4 miles southeast of Palmyra, and the elevation of the gage datum is 544.30 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 61.6 square miles.

The tabulation of water quality data is for the period from October 14, 1961, to June 21, 1966. Discharge and quality data are also summarized graphically.

No duration curve of the average daily flows was available for comparison with instantaneous flows. Annual rainfall during the period of sample collection was from 10.22 inches above normal to 11.53 inches below normal, based on records for three stations within the drainage basin. The average annual departure was — 2.15 inches.

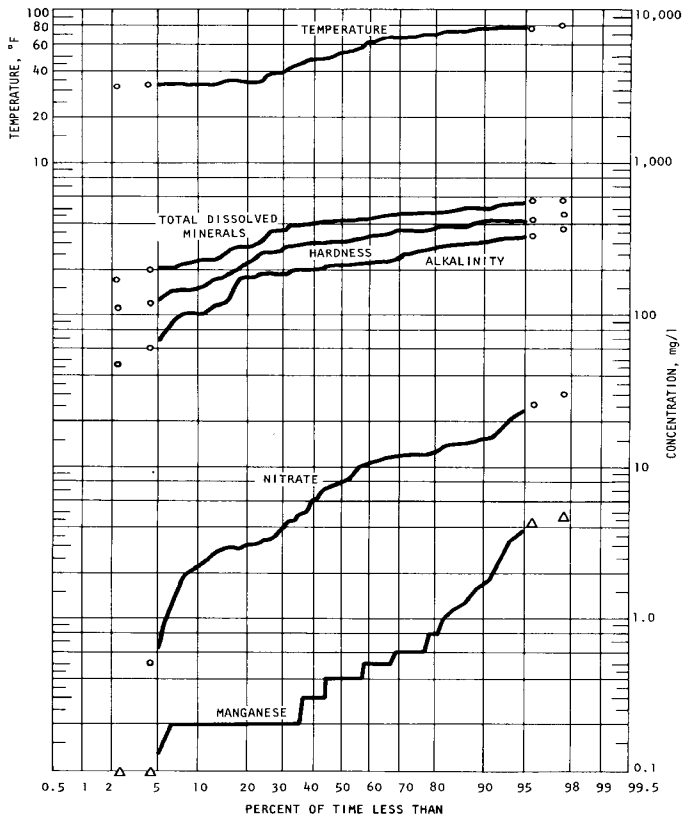
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.4 cfs/sq mi and was not less than 0.00155 cfs/sq mi, with a median flow of 0.067 cfs/sq mi. The average daily flow of record was often zero.

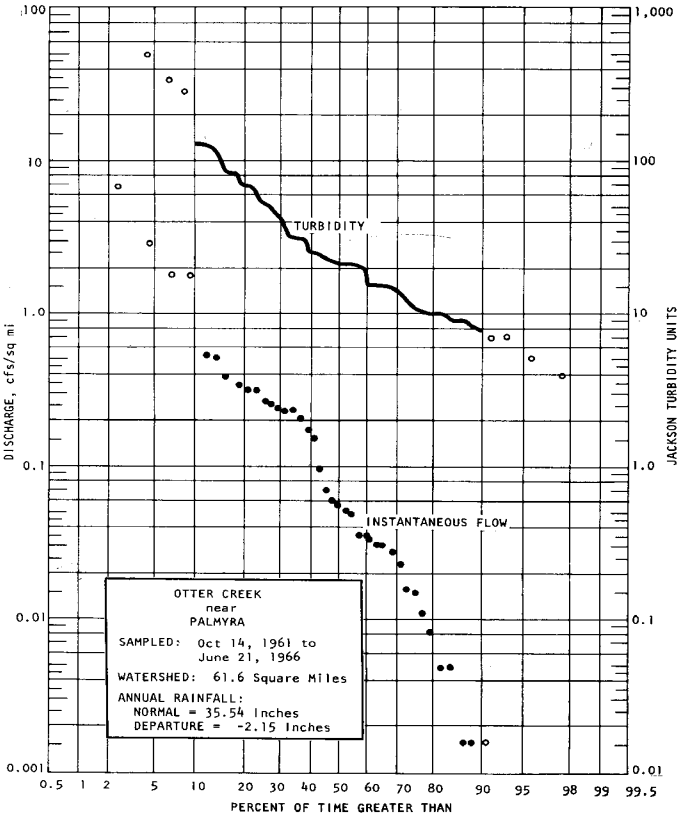
The turbidity was not less than 8 Jtu nor more than 170 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were never over 80 F, and were over 70 F for 25 percent of the time. They were below 50 F for 45 percent and below 40 F for 30 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	105	215	310
Hardness (as $CaCO_3$)	155	315	410
Total dissolved minerals	230	420	510
Nitrate	2.2	7.8	15
Manganese	0.2	0.4	1.8





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
10-14	1.0	155899	56	26	1.0	1.2	0.2	0.1	9.2	10	96.7	2.3	T	99.0	41.6	15	336	419	476	0.4
11-11	14.0	156153	47	10	0.6	0.3	0.2	0.1	13.4	11	103.9	11.9	0.1	74.7	28.2	17	208	303	398	0.4
12-11	9.3	156330	34	10	0.7	0.5	0.3	0.1	8.8	12	125.1	8.4	T	86.0	27.5	25	228	328	425	0.4
1962																				
1-13	20.9	156495	33	16	0.8	0.2	0.2	0.1	9.7	12	119.9	14.9	T	65.2	33.6	21	192	301	398	0.2
2-10	113.0	156779	34	131	4.8	0.2	0.2	0.1	8.4	8	71.0	11.8	0.1	43.8	15.7	13	108	174	234	0.5
3-12	423.0	156966	38	500	21	0.6	0.2	0.1	8.3	7	56.2	15.8	T	39.7	12.3	11	92	150	207	0.4
4-13	15.2	157295	49	7	0.4	0.1	0.2	0.2	4.1	12	129.8	7.3	T	73.0	29.5	23	196	304	392	0.2
5-11	181.0	157549	65	343	15	0.8	0.2	0.2	8.4	9	78.4	7.6	0.1	46.0	18.0	14	120	189	289	0.9
6-22	6.0	157912	73	23	0.6	0.2	0.3	0.0	10.3	11	92.8	9.9	T	75.9	25.8	22	224	296	398	0.1
7-25	0.1	158256	78	84	3.1	3.3	0.1	0.1	9.1	11	82.1	3.5	T	86.1	34.8	23	304	358	437	0.3
8-17	0.0	158412	66	124	5.4	4.8	0.2	0.1	7.6	8	30.0	6.1	T	67.3	22.6	26	240	261	320	0.3
9-14		No sample taken, no flow																		
10-11		No sample taken, no flow																		
11-9		No sample taken, no flow																		
12-13		No sample taken, no flow																		
1963																				
1-11	0.3	159367	33	14	0.7	0.1	0.1	0.2	3.5	26	163.5	4.5	0.6	85.5	30.3	36	208	338	470	0.6
2-7	14.4	159482	33	56	2.9	0.3	0.0	0.2	7.8	16	61.9	26.0	0.1	29.7	10.6	17	48	118	238	5.3
3-6	116.0	159711	34	295	13	0.6	0.2	0.1	9.8	13	50.8	31.0	0.1	34.5	9.4	14	60	125	228	1.3
4-5	19.1	159947	48	16	1.9	0.3	0.3	0.1	9.7	13	120.8	10.2	0.2	79.3	29.1	24	218	317	413	0.2
5-11	0.9	160214	63	32	0.7	1.55	0.2	0.1	4.4	16	124.9	1.2	0.2	104.4	38.4	29	328	419	540	0.2
6-7	2.1	160386	80	25	1.1	.81	0.2	0.1	5.9	12	117.7	2.9	0.1	97.6	34.8	23	296	387	501	0.3
7-17	3.5	160698	78	1713	69	1.84	0.2	0.1	7.3	4	39.7	7.7	0.1	59.6	21.4	5	194	237	270	0.2
8-10	0.0	160992	77	71	2.4	.47	0.2	0.1	5.8	4	26.1	5.2	0.1	42.6	10.3	6	124	154	178	0.6
9-13	2.8*	161221	65	45	2.1	.18	0.2	0.3	8.4	11	42.4	12.4	T	41.0	10.6	12	102	146	214	4.3
10-10		No sample taken, no flow																		
11-7		No sample taken, no flow																		
12-6	0.3	161794	40	8	0.9	.46	0.1	0.2	9.3	18	91.3	7.8	T	77.3	27.1	16	212	305	393	1.0
1964																				
1-9	0.0	162020	33	39	0.6	4.20	0.2	0.1	8.4	19	136.6	4.0	0.1	104.0	54.2	28	372	483	592	0.2
2-7	1.9	162234	34	15	1.1	.62	0.2	0.1	10.5	18	128.6	12.7	0.1	85.0	31.7	19	224	343	458	1.2
3-5	12.9	162418	45	15	0.7	.40	0.2	0.1	4.0	15	149.1	4.5	T	80.4	33.1	27	216	337	458	1.4
4-9	32.7	162677	54	22	2.3	.23	0.2	0.1	7.4	14	120.1	12.3	0.1	69.8	22.5	30	178	267	410	0.2
5-8	11.1	162874	68	26	2.1	.42	0.3	0.1	6.6	14	127.7	3.2	T	83.8	31.4	22	232	337	459	0.4
6-4	0.7	163129	68	68	1.4	1.32	0.2	0.4	6.9	18	108.8	3.0	T	91.6	33.0	24	276	365	462	0.5

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
7-23	0.1	163596	76	33	3.2	.	0.1	0.0	7.5	8	45.9	4.9	T	54.8	16.4	27	200	204	282	0.5
8-14		No sample taken, no flow				.61														
9		No sample taken, no flow																		
10-9		No sample taken, no flow																		
11-14		No sample taken, no flow																		
12-10		No sample taken, no flow																		
1965																				
1		No sample taken, no flow																		
2-5	0.1	165155	32	4	1.0	.30	0.0	0.2	16.0	30	189.2	12.1	1.9	105.4	36.8	42	256	415	576	1.4
3-12	3.8	165426	38	10	0.8	.23	0.2	0.1	7.3	25	184.5	11.6	T	97.6	35.9	32	220	391	515	1.5
4-10	39.0*	165681	50	24	1.3	.24	0.2	0.1	10.2	18	156.1	12.4	0.0	92.0	33.0	22	214	365	473	0.8
5-17	1.9	165936	68	32	1.1	1.02	0.2	0.1	5.5	18	128.4	2.0	T	108.0	39.0	22	316	430	512	0.4
6-12	16.9	166280	71	51	3.2	.24	0.2	0.1	12.2	15	81.7	21.0	T	68.8	23.2	19	184	267	360	0.5
7-22	3.2	166731	74	22	0.6	.24	0.3	0.1	9.5	15	99.1	10.9	0.0	89.6	28.3	23	256	340	434	0.8
8-14	0.5	166988	70	21	1.0	.17	0.2	0.1	7.8	12	59.2	3.1	T	59.2	19.6	15	180	228	291	0.6
9-13	3.0	167210	70	20	0.6	.49	0.2	0.1	9.1	16	104.9	0.0	T	97.6	32.2	24	296	376	461	0.1
10-8	14.8	167371	53	16	0.6	.17	0.3	0.1	8.9	17	84.7	11.3	T	72.0	26.4	19	208	288	373	0.9
11-6	2.3	167550	52	12	0.5	.48	0.2	0.1	2.3	19	101.4	0.5	T	90.0	31.7	29	280	355	438	0.6
12-11	1.7	167871	49	9	0.6	.44	0.2	0.2	3.0	21	119.9	3.0	T	96.0	36.6	30	300	390	486	0.7
1966																				
1-17	4.4	168123	33	11	0.6	.42	0.1	0.2	11.4	20	134.3	15.2	T	98.0	36.6	29	284	395	494	1.1
2-19	20.0	168299	35	7	0.6	.17	0.3	0.1	11.4	16	121.2	14.1	T	80.0	31.7	21	220	330	424	0.5
3-15	30.5	168539	44	9	0.6	.17	0.3	0.1	10.1	22	122.2	13.4	T	76.0	26.9	28	192	300	416	0.4
4-18	24.0	168717	57	5	0.3	.15	0.3	0.1	6.5	20	125.5	6.3	T	78.0	30.5	27	216	320	438	0.2
5-25	36.0*	169037	68	82	4.5	.35	0.3	0.0	12.1	14	99.2	14.5	0.0	74.0	27.6	13	192	298	374	0.4
6-21	1.4	169134	74	22	1.0	.44	0.5	0.1	9.4	18	96.7	3.4	T	74.0	33.0	21	236	320	431	0.5
7-14		No sample taken, no flow																		
8-10		No sample taken, no flow																		
9-7		No sample taken, no flow																		

*USGS average daily discharge

ROCK RIVER AT COMO

The Rock River rises in Wisconsin and flows southerly and southwesterly into Illinois through the Rock River Hills Region and into the Green River Lowland Region. The gaging station near Como is located 3 miles downstream from Rock Falls and 3.5 miles upstream from Elkhorn Creek. Elevation of the gage datum is 606.83 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of approximately 8700 square miles.

Tabulations of water quality data are for the periods from July 20, 1956 to October 20, 1961, and from November 17, 1961, to September 12, 1966. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements were generally somewhat lower than those indicated by the USGS average daily flow records during the period 1950-1964. Annual rainfall during the first sampling period was from 10.93 inches above normal to 9.77 inches below normal, and for the second sampling period was from 13.98 inches above normal to 11.36 inches below normal, based on records for four stations within the drainage basin. The average annual departure was + 1.26 inches for the first period and — 1.35 inches for the second period.

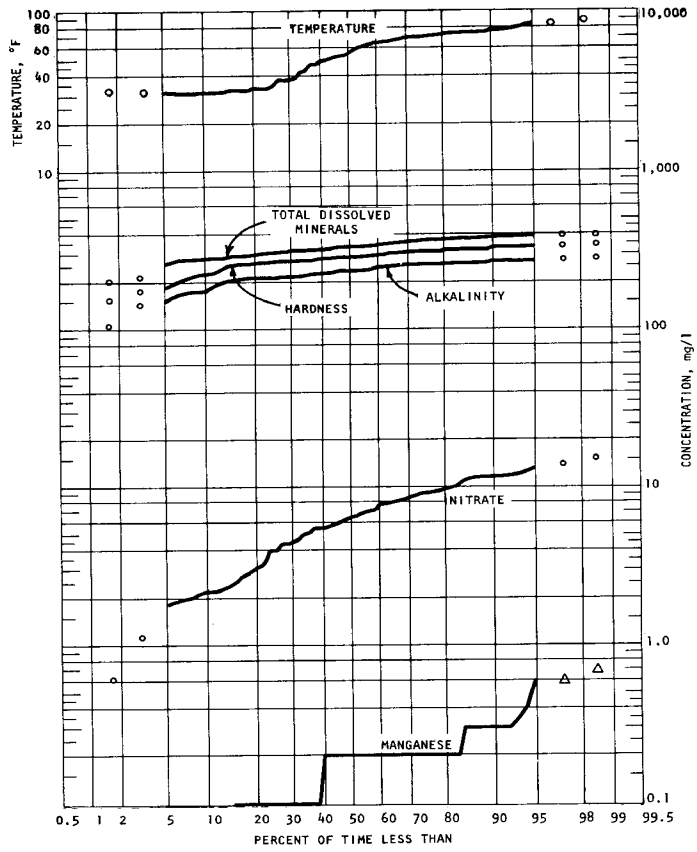
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 0.85 cfs/sq mi (1956-1961) or 1.26 cfs/sq mi (1961-1966), and was not less than 0.14 cfs/sq mi (1956-1961 and 1961-1966). Median flows were 0.35 cfs/sq mi (1956-1961) and 0.33 cfs/sq mi (1961-1966). The minimum average daily flow of record was 640 cfs in January 1957.

Turbidities were not less than 6 Jtu (1956-1961) or 5 Jtu (1961-1966), nor more than 70 Jtu (1956-1961) or 85 Jtu (1961-1966) for the central 80 percent of the time. Median values were 30 Jtu (1956-1961) and 35 Jtu (1961-1966).

The reported temperatures were over 80 F for 7 percent of the time (1956-1961 and 1961-1966), and over 70 F for 30 (1956-1961) and 28 (1961-1966) percent of the time. They were below 50 F for 37 (1956-1961) and 43 (1961-1966) percent of the time, and below 40 F for 30 percent of the time (1956-1961 and 1961-1966).

The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1956-1961)	175	240	280
	(1961-1966)	175	235	280
Hardness (as $CaCO_3$)	(1956-1961)	225	290	340
	(1961-1966)	230	290	355
Total dissolved minerals	(1956-1961)	285	340	390
	(1961-1966)	295	340	425
Nitrate	(1956-1961)	2.2	6.4	12
	(1961-1966)	4.6	9.6	17.8
Manganese	(1956-1961)	T	0.2	0.3
	(1961-1966)	0.1	0.2	0.3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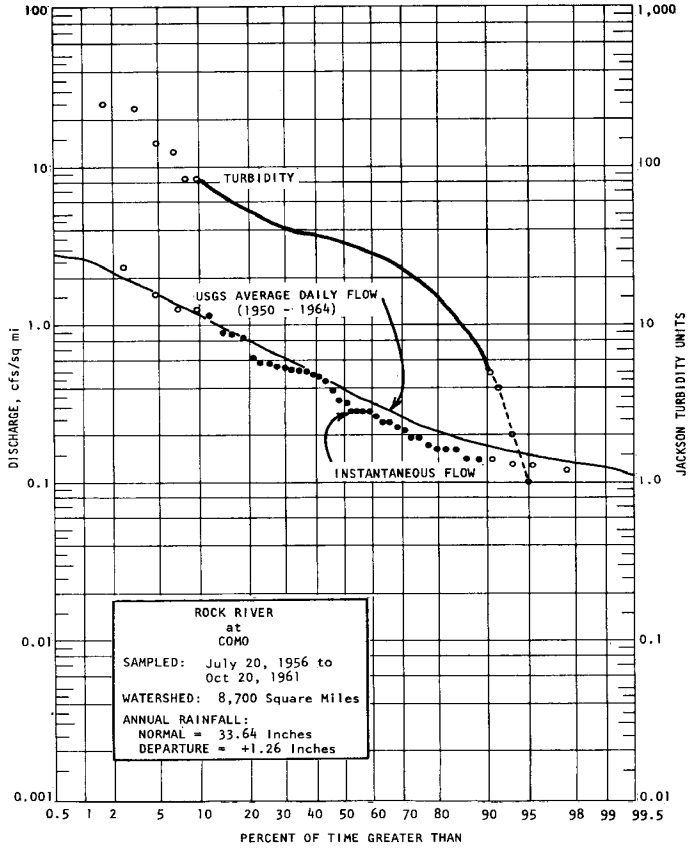
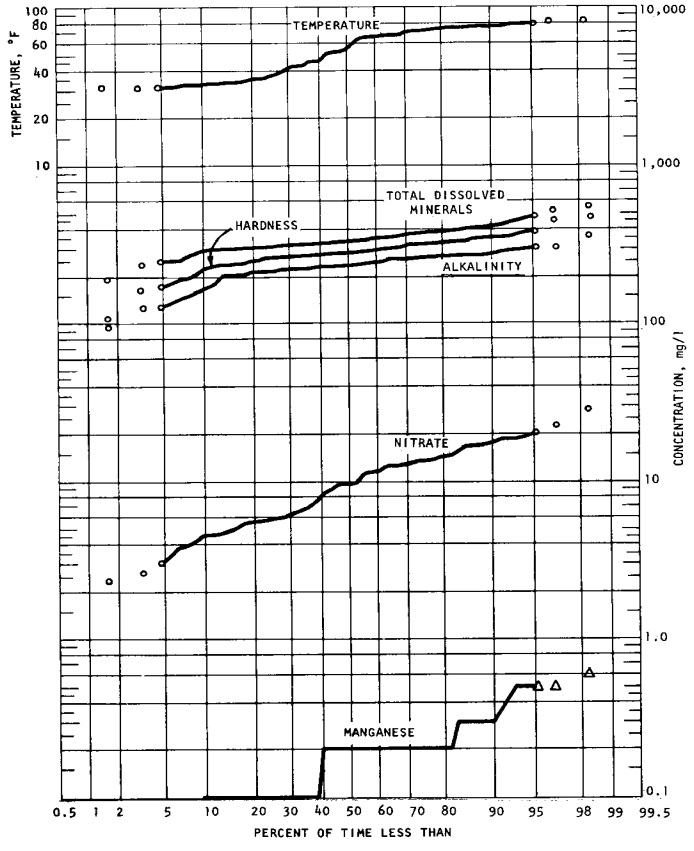
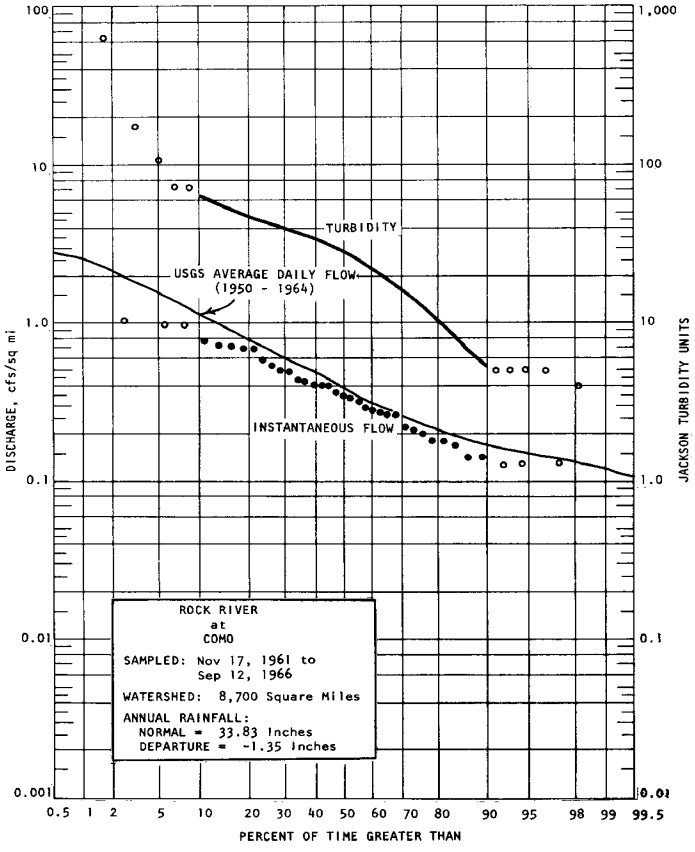
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
USGS AVERAGE DAILY FLOW (1950 - 1964)
INSTANTANEOUS FLOW
ROCK RIVER at COMO
SAMPLED: July 20, 1956 to Oct 20, 1961
WATERSHED: 8,700 Square Miles
ANNUAL RAINFALL:
NORMAL = 33.64 Inches
DEPARTURE = +1.26 Inches
DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN


TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
MANGANESE
TEMPERATURE, °F
CONCENTRATION, mg/l
PERCENT OF TIME LESS THAN


TURBIDITY
USGS AVERAGE DAILY FLOW (1950 - 1964)
INSTANTANEOUS FLOW
ROCK RIVER at COMO
SAMPLED: Nov 17, 1961 to Sep 12, 1966
WATERSHED: 8,700 Square Miles
ANNUAL RAINFALL:
NORMAL = 33.83 Inches
DEPARTURE = -1.35 Inches
DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-20	3570.0	141068		109	4.1	0.2	0.1	0.0	7.3	8	25.9	8.9	0.2	40.6	18.2	6	144	177	217	
8-23	1200.0	141326	85	46	1.7	0.6	0.1	0.2	2.3	15	41.1	0.6	0.6	56.1	34.0	20	260	281	334	
9-18	1570.0	141515	67	40	2.5	0.3	0.1	0.1	1.1	18	50.2	2.2	0.5	52.8	35.5	13	228	278	343	
10-24	1130.0	141758	63	11	1.8	0.2	0.2	0.1	0.6	16	38.3	2.3	0.3	59.5	35.6	10	252	295	325	
12-19	1580.0	142203	56	6	.8	T	0.1	0.1	5.2	13	36.4	5.5	0.7	68.4	36.6	7	276	321	349	
1957																				
2-21	3460.0	142696	32	16	0.8	0.2	0.1	0.1	10.3	16	33.1	6.8	2.2	44.9	18.2	17	168	188	276	
3-20	2910.0	142942	38	27	1.0	0.1	0.1	0.1	3.9	16	46.7	8.1	T	64.5	30.8	12	236	288	348	
4-24	3780.0	143202	65	15	0.7	0.1	0.1	0.1	4.7	12	50.6	7.0	T	60.8	27.8	13	220	267	327	
6-26	3530.0	143774	75	19	1.7	0.2	0.1	0.2	8.4	12	46.3	6.8	T	60.0	30.8	6	220	277	310	
7-23	4330.0	144024	75	68	2.9	0.2	0.1	0.2	5.0	12	35.8	2.9	T	56.5	28.5	5	212	258	284	
8-29	2470.0	144388	75	33	3.0	0.3	0.3	0.1	1.6	18	35.2	4.6	0.1	52.3	34.6	13	237	273	336	
10-2	1260.0	144718	65	25	2.9	0.3	0.1	0.2	2.7	18	34.6	4.4	T	55.1	35.3	6	232	283	298	
10-31	2280.0	144897	50	32	1.3	0.2	0.2	0.0	4.1	15	37.6	6.4	T	64.2	35.6	8	260	307	345	
12-4	1500.0	145195	34	10	0.5	0.0	0.2	0.1	6.2	20	49.2	5.5	0.2	65.0	36.0	15	260	311	389	
1958																				
1-9	2300.0*	145449	32	19	0.6	T	0.1	0.1	6.1	21	59.5	7.8	0.2	73.0	39.0	8	262	343	388	
2-5	1880.0*	145663	33	4	0.3	0.1	0.2	0.0	7.0	20	37.2	9.1	T	68.5	36.4	3	254	321	363	
3-11	5110.0	146022	38	7	0.7	T	0.1	0.0	9.5	16	59.2	8.0	T	66.4	33.6	9	232	304	369	
4-14	3820.0	146328	59	47	3.3	0.2	0.2	0.1	2.3	14	59.5	5.4	0.1	64.6	32.5	5	220	295	328	
5-15	1790.0	146631	73	16	1.5	0.2	0.1	0.0	4.0	14	39.7	1.9	T	49.2	36.3	1	216	277	310	
6-26	2280.0	146982	71	42	3.6	0.2	0.1	0.0	7.4	19	60.1	14.2	0.1	72.6	31.9	15	244	312	381	
7-31	1240.0	147392	79	10	2.3	0.1	0.1	0.0	3.6	15	43.8	3.9	T	53.7	30.7	8	208	261	301	
9-5	1020.0*	147601	71	36	2.3	0.2	0.1	0.0	5.5	16	40.3	4.4	T	44.4	32.7	10	200	246	292	
10-15	2310.0	147962	61.3	47	2.7	0.2	0.1	0.1	7.6	16	35.8	5.6	T	59.1	29.9	15	240	271	324	
11-7	1410.0*	148151	43	24	2.7	0.1	0.1	0.0	9.4	18	46.5	2.0	T	52.2	37.8	17	248	286	357	
12-16	1250.0*	148495	32	9	1.6	0.4	0.1	0.0	9.3	22	58.0	2.2	T	64.6	41.2	12	264	331	391	
1959																				
1-4	1000.0*	148673	32	5	0.5	0.2	0.1	0.1	11.6	21	42.2	3.2	T	69.8	38.3	9	276	332	391	
2-10	1400.0*	148826	32	5	0.5	0.3	0.1	0.1	9.9	25	46.3	2.4	0.1	64.9	37.6	17	268	317	395	
3-18	8760.0	149094	32	175	5.6	0.2	0.1	0.0	10.2	12	33.1	3.9	T	38.3	14.1	3	108	155	205	
4-21	12700.0*	149376	53	10	0.6	0.2	0.1	0.1	4.8	9	38.9	4.5	T	72.3	33.6	12	264	294	336	
5-19	4190.0*	149640	68	39	2.1	0.3	0.1	0.0	1.0	15	47.7	1.1	0.3	58.1	28.1	12	216	261	308	
6-23	1150.0	149928	78	37	4.2	0.2	0.2	0.1	2.2	17	50.0	1.8	T	55.5	32.3	15	228	272	340	
7-29	2260.0*	150260	86.5	43	2.2	0.3	0.1	0.0	6.7	15	32.1	5.1	T	51.8	24.4	10	194	230	284	
8-25	1730.0	150450	90.5	21	0.9	0.2	0.1	0.0	8.1	19	38.1	3.1	T	53.3	33.7	6	216	272	327	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
9-9	1700.0*	150565	83	39	1.9	0.2	0.1	0.1	11.6	26	35.6	6.5	0.1	66.3	29.7	20	252	288	379	
10-13	5980.0	150826	52	73	3.7	0.2	0.2	0.1	12.0	13	54.7	11.9	T	65.4	29.5	7	216	285	346	
11-10	8120.0*	150986	44	62	2.4	0.1	0.2	0.0	7.7	14	58.8	9.8	T	65.5	31.1	8	220	292	341	
12-15	4590.0	151241	38	7	0.5	0.1	0.1	0.1	7.1	15	63.4	9.3	T	75.8	36.6	7	260	340	371	
1960																				
1-13	22500.0*	151502	35	650	25	0.7	0.1	0.0	8.4	12	48.1	5.9	T	67.1	24.8	8	216	276	332	0.7
2-16	6140.0	151720	33	30	0.6	0.1	0.2	0.0	9.7	15	63.6	15.3	0.1	74.0	34.4	13	256	327	400	0.4
3-10	3900.0*	151836	33	37	2.0	0.1	0.1	0.0	8.3	15	62.3	9.4	T	73.6	36.8	10	264	336	399	0.2
4-12	18300.0*	152030	48	71	3.3	0.1	0.2	0.0	8.9	10	41.8	10.0	T	52.1	23.0	8	176	225	277	0.6
5-26	15200.0*	152300	69	29	2.8	0.1	0.1	0.0	5.9	11	47.9	5.8	T	68.1	31.2	1	232	299	341	0.6
6-23	6760.0	152571	73	33	2.4	0.1	0.1	0.0	9.7	12	48.3	11.8	T	73.2	34.8	6	262	326	379	0.7
7-15	6080.0	152780	74	56	3.7	0.1	0.2	0.1	9.7	14	44.0	11.6	T	70.2	32.8	14	260	310	373	1.0
8-11	5080.0*	152941	74	41	3.3	0.2	0.2	0.1	6.4	11	37.2	8.4	T	61.3	33.2	11	252	290	315	0.9
9-20	4220.0	153273	66	31	2.0	0.6	0.2	0.1	13.4	8	35.4	2.7	T	67.9	34.1	6	272	310	322	0.1
10-21	4810.0*	153498	51	21	0.9	0.1	0.2	0.1	8.4	12	46.7	7.9	T	68.1	34.9	7	258	314	365	0.7
11-15	6360.0	153645	48	7	1.0	0.0	0.1	0.1	9.3	12	49.0	7.7	0.1	68.7	34.8	10	264	315	374	0.7
12-19	4110.0*	153824	32	16	1.0	0.0	0.1	0.3	10.0	12	50.4	11.5	0.1	74.7	36.0	13	284	335	378	0.7
1961																				
1-17	2950.0	154055	34	5	0.2	0.0	0.2	0.1	7.5	16	43.4	12.7	0.1	70.8	36.0	13	276	325	380	1.0
2-14	3070.0	154198	34	5	0.3	0.0	0.1	0.1	8.2	17	42.8	11.9	T	68.2	37.3	14	276	324	376	0.9
3-21	11600.0*	154445	39	73	3.4	0.2	0.2	0.0	5.8	9	36.0	13.5	T	50.0	22.1	10	176	216	280	0.7
4-25	8530.0	154722	54	45	2.6	0.2	0.1	0.1	3.5	12	49.6	9.1	T	66.5	31.5	9	240	296	355	0.4
5-23	4080.0*	154913	62	28	1.8	0.2	0.2	0.1	1.4	12	48.8	7.1	T	60.7	35.5	9	244	298	337	0.5
6-6	3260.0	154984	76	26	1.5	0.2	0.1	0.0	1.5	12	43.0	6.0	T	58.7	34.8	9	244	290	320	0.5
7-6	2560.0	155230	72	13	0.7	0.1	0.1	0.1	2.0	13	40.1	6.3	0.1	49.9	34.8	9	224	268	298	0.7
8-22	1910.0	155552	75	33	1.2	0.2	0.1	0.1	1.6	15	35.2	5.0	0.1	46.5	35.9	10	224	264	311	0.8
9-19	8540.0	155694	64	58	3.3	0.2	0.2	0.1	12.9	8	37.4	11.2	T	48.0	20.2	4	152	203	258	0.9
10-20	5980.0*	156032	54	30	1.6	0.2	0.2	0.1	7.7	12	49.4	8.5	0.1	70.1	33.4	3	244	313	347	0.7
11-17	18300.0*	156164	43	250	14	0.5	0.2	0.1	11.1	9	45.3	13.3	0.1	67.0	27.8	5	224	282	328	0.8
12-11	7400.0*	156324	33	17	0.9	T	0.1	0.0	10.8	11	57.8	12.2	T	73.3	37.3	8	268	337	395	0.5
1962																				
1-29	4520.0	156583	39	4	0.3	0.1	0.2	0.1	9.7	14	61.7	11.5	0.8	76.6	38.5	10	280	350	392	0.6
2-20	4060.0	156834	32	0	0.1	0.1	0.2	0.1	9.5	15	49.6	13.7	T	75.0	35.9	11	276	335	386	0.7
3-27	25000.0*	157073	47	83	2.0	0.1	0.2	0.1	8.0	8	35.6	9.6	T	47.2	20.6	2	152	203	243	0.7
4-17	13700.0	157312	47	32	2.2	0.1	0.1	0.0	3.9	9	42.6	9.7	T	59.0	28.6	4	208	265	309	0.5
5-15	10200.0	157553	66	77	4.1	0.2	0.1	0.0	7.8	13	48.5	13.2	T	72.1	29.1	26	276	300	386	0.5

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1962																				
6-11	5070.0	157805	75	41	2.0	0.1	0.1	0.0	8.0	15	44.2	8.7	0.1	71.0	35.9	4	260	325	341	0.7
7-16	3270.0	158217	72	28	1.5	0.2	0.2	0.1	8.1	13	43.8	6.7	0.1	61.4	33.7	8	240	292	318	0.7
8-20	2110.0	158461	79	31	1.9	0.2	0.1	0.1	4.2	14	36.4	4.6	T	54.1	35.6	26	276	281	319	0.7
9-17	2410.0	158649	71	36	2.0	0.2	0.1	0.1	8.8	16	36.8	7.1	0.1	59.0	33.9	11	244	287	335	1.0
10-16	2510.0*	158856	66	67	2.8	0.3	0.1	0.0	2.4	16	37.6	3.0	1.0	59.7	35.4	12	260	295	347	1.5
11-12	2430.0	159028	44	12	0.5	0.1	0.2	0.1	7.3	17	36.6	11.1	0.1	71.1	37.0	8	276	330	363	1.1
12-11	1100.0*	159194	32	16	1.7	0.2	0.1	0.0	8.5	17	43.8	12.3	0.1	77.6	40.6	6	296	361	410	1.1
1963																				
1-14	1420.0	159388	32	5	0.2	T	0.0	0.1	8.8	18	38.1	14.5	0.1	75.3	32.0	15	276	320	378	1.5
2-11	1940.0	159543	32	1	0.5	0.1	0.1	0.1	9.9	22	40.5	22.4	0.1	70.7	37.9	12	276	333	415	1.5
3-12	5230.0*	159773	37	33	1.0	0.2	0.1	0.1	8.8	14	35.8	20.7	0.2	36.6	16.7	17	124	160	250	2.8
4-15	4340.0*	160028	58	35	1.2	0.2	0.2	0.0	1.5	12	41.3	10.2	0.2	56.3	24.6	15	208	242	315	0.7
5-17	2080.0*	160240	62	42	2.9	0.2	0.2	0.1	1.8	14	52.5	3.8	0.1	48.9	32.2	15	212	255	327	0.4
6-14	3810.0	160406	77	36	2.0	.00	0.2	0.1	4.2	10	43.8	15.4	0.1	58.5	29.2	19	236	266	325	0.0
7-16	1380.0	160737	81	18	0.8	.22	0.1	0.1	2.6	20	40.3	5.7	0.1	52.3	34.0	13	226	271	310	1.2
8-23	1230.0	161046	77.8	23	1.0	.11	0.2	0.1	2.6	20	38.3	4.0	0.1	55.7	33.4	13	234	277	305	1.2
9-20	1360.0	161270	72	45	3.4	.22	0.1	0.2	2.0	27	39.1	5.6	0.1	55.3	33.7	17	232	277	313	0.9
10-18	1170.0	161468	69	84	1.9	.20	0.1	0.1	3.2	25	37.6	7.6	0.1	50.0	33.1	24	232	261	330	1.0
11-11	1520.0	161625	51	28	2.6	.14	0.2	0.1	7.5	24	38.3	5.5	0.1	52.8	32.3	23	236	265	334	1.0
12-27	1640.0	161904	34	11	1.8	.09	0.1	0.1	11.9	25	49.6	13.1	0.1	68.2	39.0	16	268	331	382	1.1
1964																				
1-14	1090.0	162015	34	126	23	.49	0.1	0.1	17.2	28	43.0	12.6	0.1	88.1	38.8	16	356	380	476	1.1
2-10	1650.0	162248	36	2	0.4	.12	0.1	0.1	9.2	20	49.8	9.0	1.0	64.7	31.6	12	232	292	341	1.4
3-13	4690.0	162423	43	36	2.0	.20	0.1	0.1	9.2	11	39.3	18.7	0.1	52.1	24.2	8	176	230	275	1.5
4-17	2880.0	162728	67	36	7.9	.21	0.2	0.0	7.6	16	86.4	16.8	0.1	70.1	31.7	11	204	306	355	0.3
5-15	4150.0	162950	65	39	1.7	.19	0.2	0.1	4.1	16	59.9	13.4	0.1	68.8	32.6	10	232	306	340	0.9
6-30	1810.0	163367	83	20	0.8	.14	0.2	0.1	4.1	20	45.5	9.7	T	58.3	30.5	11	212	272	316	0.9
7-16	1220.0	163544	84	24	1.1	.02	0.1	0.0	3.1	19	46.5	5.2	T	54.4	32.2	24	240	268	337	0.8
8-13	1210.0	163708	67	19	1.6	.10	0.2	0.0	2.9	25	51.6	4.6	T	54.2	34.3	26	240	276	357	0.9
9-15	1080.0*	164281	55	60	4.0	.22	0.2	0.1	1.4	29	20.2	4.7	T	55.1	32.0	24	256	269	346	1.1
10-16	1050.0	164499	54	33	2.7	.39	0.1	0.1	2.2	28	44.8	8.4	0.1	40.1	34.0	35	224	240	331	1.1
11-16	1210.0*	164721	53	27	1.9	.16	0.1	0.1	0.7	24	27.6	5.5	0.1	51.9	36.4	17	248	279	331	1.0
12-11	1580.0*	164825	34	6	0.2	.12	0.1	0.1	10.4	25	62.9	16.7	T	70.4	36.1	25	264	324	412	2.0
1965																				
1-11	2400.0	164997	33.5	27	1.0	.21	0.0	0.2	8.1	16	46.7	11.6	2.0	42.4	22.4	14	148	198	293	1.8
2-15	11100.0	165195	33	75	4.4	.25	0.2	0.2	6.4	13	30.2	6.0	2.0	26.7	10.1	18	92	108	187	1.4
3-30	5410.0	165523	33	37	2.6	.19	0.1	0.0	10.2	18	47.5	16.7	T	54.4	25.2	13	176	239	306	1.7

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1965																				
4-7	20200.0	165717	44	238	11	.54	0.1	0.0	9.5	10	35.0	17.8	T	44.0	14.1	12	126	168	233	1.3
5-11	8000.0*	165930	67	51	3.3	.17	0.2	0.1	9.2	15	59.2	18.5	T	68.4	30.0	11	218	294	353	0.8
6-15	2300.0*	166313	73	28	1.8	.20	0.1	0.1	3.0	20	51.6	6.3	T	52.8	35.4	13	218	277	330	0.8
7-16	2460.0	166662	76	23	1.6	.26	0.2	0.1	3.2	24	42.4	6.4	T	48.6	34.2	21	224	262	334	1.2
8-5	1470.0*	166850	74	32	2.0	.27	0.2	0.1	2.8	24	41.3	6.6	T	50.0	31.6	24	224	255	325	0.9
8-19	2750.0	167001	77	24	1.7	.21	0.2	0.1	2.3	23	45.7	6.1	T	46.0	31.6	20	204	245	326	0.9
9-20	8690.0*	167224	68	52	3.5	.17	0.2	0.1	6.1	16	48.5	5.6	0.4	60.0	35.6	2	224	296	336	0.8
10-11	7660.0	167372	54	43	2.0	.19	0.1	0.0	10.4	15	64.6	9.5	T	69.6	31.6	12	232	304	379	1.7
11-8	4480.0	167556	47	141	12	.62	0.2	0.1	8.2	16	67.7	9.6	0.0	82.4	36.0	11	274	354	427	2.2
12-6	4880.0	167827	36	15	1.0	.06	0.2	0.1	6.3	20	72.0	12.4	0.0	80.8	37.5	15	272	356	430	2.1
1966																				
1-3	11000.0	168031	36	8	0.7	.07	0.2	0.1	6.0	20	129.6	29.0	0.0	110.4	45.7	10	298	464	544	0.5
2-3	3500.0	168202	33	0	0.1	.07	0.1	0.1	11.0	24	72.6	13.5	T	84.0	40.2	17	292	375	454	0.8
3-1	7080.0	168384	38	39	2.3	.17	0.1	0.1	11.1	21	56.4	14.8	T	70.0	29.3	12	220	295	351	1.1
4-8	7840.0	168664	41	25	1.6	.17	0.1	0.0	6.5	20	65.8	11.5	T	74.0	31.7	12	236	315	380	0.8
5-10	4630.0	168861	52	24	2.5	.17	0.2	0.1	1.7	18	65.8	5.9	T	60.0	22.0	38	224	240	366	0.3
6-15	5980.0	169110	68	38	2.3	.13	0.1	0.1	6.7	5	61.1	12.4	T	75.0	33.6	2	248	325	356	0.7
7-5	3070.0*	169214	83	52	3.3	.02	0.1	0.2	6.3	17	54.3	4.9	0.1	74.0	35.4	10	268	330	372	0.9
8-1	2270.0	169541	77	9	0.7	.14	0.3	0.1	10.7	24	126.3	2.6	0.1	104.0	43.9	13	300	440	512	0.5
9-12	2080.0	169851	71	62	1.3	.25	0.3	0.1	6.9	10	29.8	2.3	0.3	65.0	34.8	2	264	305	304	0.2

SANGAMON RIVER AT MONTICELLO

The Sangamon River rises in the Bloomington Ridged Plain—South, between Bloomington and Gibson City. The gaging station at Monticello is located 0.5 mile west of town, and the elevation of the gage datum is 625.89 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 550 square miles.

The tabulation of water quality data is for the period from September 4, 1956, to October 2, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were reasonably similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 7.75 inches above normal to 4.89 inches below normal, based on records for two stations within the drainage basin. The average annual departure was — 1.72 inches.

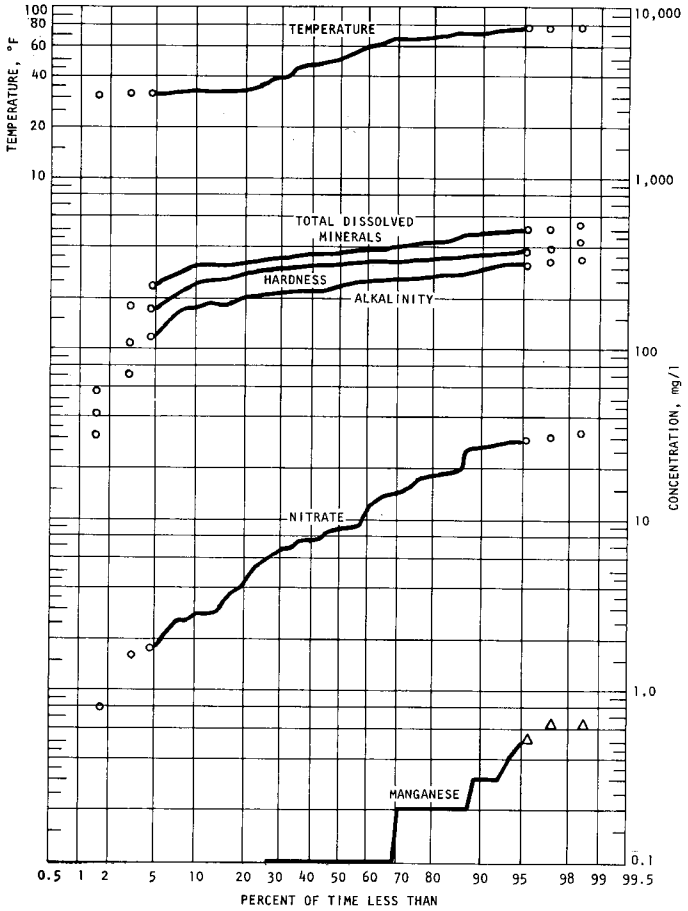
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.4 cfs/sq mi and was not less than 0.025 cfs/sq mi, with a median flow of 0.278 cfs/sq mi. The minimum average daily flow of record was 0.3 cfs in October 1954.

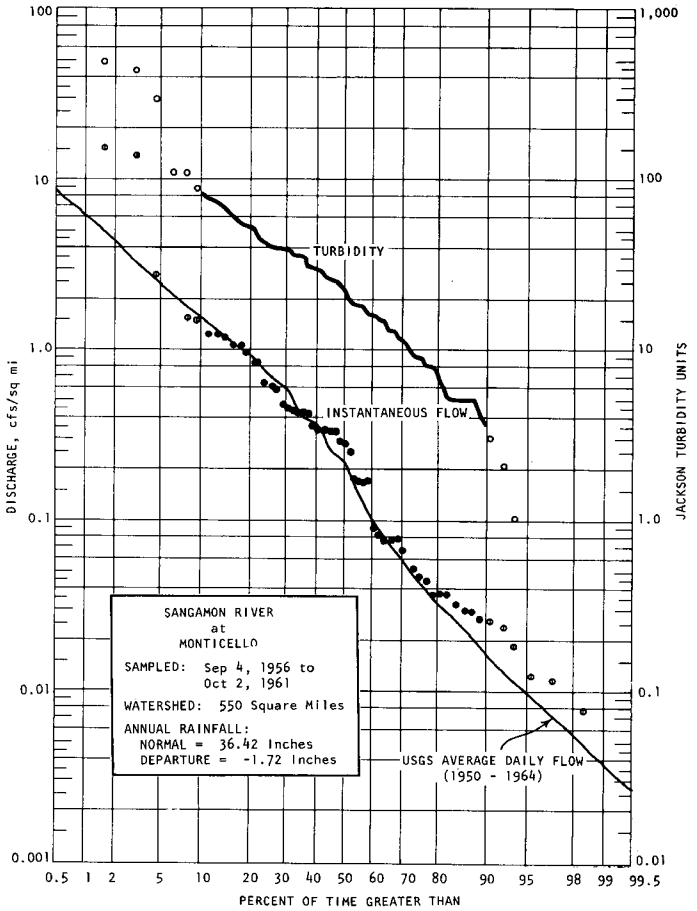
The turbidity was not less than 4 Jtu nor more than 90 Jtu for the central 80 percent of the time, with a median value of 35 Jtu.

Reported temperatures were over 80 F for 5 percent, and over 70 F for 20 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (mg/l) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	165	235	300
Hardness (as $CaCO_3$)	205	325	360
Total dissolved minerals	255	380	485
Nitrate	2.4	8.7	26
Manganese	0	0.1	0.3





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
9-4	25.0	141392	71.5	36	1.5	0.4	0.1	0.3	2.3	20	74.3	2.5	0.6	82.5	37.1	14	284	423	423	
10-16	4.2	141682	66.5	19	1.1	0.6	0.3	0.6	14.3	54	59.9	0.8	4.3	85.1	38.7	47	348	372	542	
11-1	6.8	141776	57.3	5	2.0	0.3	0.2	0.3	12.0	44	65.2	3.9	1.2	85.6	37.2	40	324	367	489	
11-30	9.9	142007	35	4	0.3	0.1	0.1	0.1	11.7	44	89.9	7.4	T	88.7	36.8	44	308	374	516	
12-3	96*	142230	34	0	0.3	T	0.3	0.2	6.6	37	83.1	2.7	0.2	82.5	38.5	36	304	365	465	
1957																				
2-1	36.0	142492	33	2	0.3	T	0.3	0.2	9.1	29	84.5	8.6	0.8	85.1	25.6	16	216	319	403	
2-28	249.0	142735	40.5	11	0.7	0.1	0.2	0.1	6.5	8	72.2	17.7	T	70.5	27.5	5	200	290	329	
4-1	182.0	142996	49.8	9	0.4	0.1	0.2	0.1	4.3	10	68.3	18.0	T	65.8	25.1	4	176	268	306	
4-29	7600.0	143220	60	500	6.5	0.3	0.2	0.2	9.8	5	30.2	16.1	T	34.1	6.0	8	76	110	178	
7-31	153.0	144110	79.5	25	0.9	0.1	0.3	0.0	10.9	10	67.7	10.2	T	81.0	32.9	3	252	338	390	
9-3	28.0	144317	72.5	53	1.6	0.2	0.3	0.1	7.6	13	80.4	2.8	T	72.0	34.5	10	240	322	360	
9-30	13.0	144601	64.5	13	0.9	T	0.1	0.0	13.0	40	89.7	14.2	T	79.9	36.9	44	284	351	508	
10-31	18.0	144868	48.3	6	0.6	T	0.1	0.1	9.0	24	82.1	5.4	0.1	71.3	31.8	18	224	310	386	
12-2	42.0	145176	35.8	3	0.2	0.0	0.2	0.1	8.4	11	81.0	6.0	T	83.5	33.6	10	264	347	396	
1958																				
1-31	318.0	145599	34	21	4.3	T	0.2	T	8.5	9	70.8	16.0	T	74.0	33.0	1	224	320	365	
2-28	135.0	145854	37.8	8	0.7	0.1	0.2	0.0	5.7	11	61.9	8.9	T	60.5	26.2	5	182	259	295	
4-1	192.0	146117	50	8	0.5	0.1	0.2	0.1	5.7	11	72.2	9.0	T	68.7	32.2	3	212	304	335	
4-30	182.0	146492	54.5	12	0.7	0.1	0.3	0.1	5.2	11	70.8	7.2	0.1	72.2	33.4	0	224	318	349	
5-29	94.0	146745	67.2	31	1.3	0.1	0.1	0.1	9.8	14	64.2	11.9	T	70.2	32.6	11	238	310	359	
6-2	153.0	146766	62.8	60	2.9	0.2	0.1	0.1	8.0	8	59.9	14.2	T	66.4	24.5	11	204	266	330	
6-30	675.0	147000	70	55	2.8	0.0	0.1	0.0	11.5	6	59.0	14.7	T	70.5	25.2	12	224	280	349	
7-24	650.0	147246	69	45	2.2	0.1	0.1	0.0	11.2	9	56.4	8.4	T	78.8	30.2	0	244	321	359	
8-1	860.0	147342	73.5	250	5.5	T	0.1	0.0	9.4	5	35.0	7.5	T	49.4	19.7	4	164	205	253	
9-7	90.0	147566	67	18	1.0	0.1	0.2	0.1	9.7	14	61.7	2.4	T	79.0	34.4	11	276	339	377	
10-1	48.0	147815	57	31	0.9	0.1	0.2	0.1	16.3	23	61.1	5.1	T	73.6	35.3	20	272	329	403	
11-6	28.0	148103	48.7	5	0.5	0.1	0.1	0.1	7.3	16	72.4	1.7	T	77.4	36.8	14	276	345	427	
12-2	245.0	148290	33	9	0.2	0.1	0.1	0.1	10.0	10	64.7	6.5	T	73.6	35.0	3	248	328	376	
1959																				
1-2	90.0	148556	33.2	5	0.4	0.1	0.3	0.1	10.8	14	64.0	2.8	T	70.1	30.0	12	236	299	353	
2-12	8450.0	148817	35.5	440	6.3	0.2	0.1	0.0	2.8	3	10.1	1.6	0.1	9.6	5.0	2	32	43	57	
3-2	524.0	148963	40.0	41	2.5	0.2	0.1	0.1	8.0	9	53.7	3.3	T	61.1	23.3	1	180	249	301	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
4-1	584.0	149209	50.2	29	1.5	0.1	0.1	0.0	6.8	10	64.2	18.4	T	67.1	30.6	2	204	294	333	
5-1	467.0	149441	58.2	25	5.2	0.2	0.1	0.0	6.9	13	61.3	18.6	T	74.2	28.1	6	216	301	343	
6-1	256.0	149735	75	68	3.2	0.1	0.3	0.1	9.2	10	62.5	12.8	T	75.7	28.8	1	220	308	344	
7-1	42.0	149954	79.5	39	2.2	0.2	0.2	0.1	11.5	32	60.3	5.1	T	78.6	31.3	23	264	325	413	
8-3	14.0	150263	74	26	1.2	0.3	0.2	0.1	10.8	27	66.0	6.7	T	76.3	32.8	29	276	326	429	
9-1	6.5	150472	72.5	16	3.2	0.6	0.2	0.1	13.8	63	43.2	8.9	T	68.8	29.7	57	276	294	470	
10-1	41.0	150703	62	88	4.9	0.2	0.1	0.1	7.9	10	45.9	7.6	T	38.0	16.1	10	116	161	222	
11-2	16.0	150892	52	40	2.1	0.2	0.2	0.1	8.5	21	86.8	3.9	T	75.6	35.3	21	252	334	429	
12-1	42.0	151086	33	10	0.8	0.1	0.3	0.0	9.5	13	86.6	8.9	T	80.0	35.5	10	252	346	400	
1960																				
1-4	180.0	151326	32	13	0.5	T	0.2	0.0	6.4	11	75.3	18.1	T	77.4	32.2	5	228	326	365	0.3
2-1	230.0	151551	32.5	15	0.3	T	0.2	0.0	6.6	10	69.7	13.7	0.1	70.3	29.7	7	216	298	347	0.2
3-1	180.0	151740	32	18	0.3	T	0.2	0.1	7.3	16	76.3	18.6	T	79.2	34.2	9	240	339	399	0.3
4-4	1490.0	151978	46	39	1.6	0.0	0.2	0.0	7.8	7	59.4	29.0	T	63.0	24.1	3	168	257	316	0.3
5-2	570.0	152177	54	77	2.1	0.1	0.2	0.0	5.2	11	67.9	30.8	T	70.6	30.0	7	204	300	352	0.2
6-1	345.0	152353	67	23	1.1	0.1	0.2	0.1	8.9	15	67.1	25.9	T	76.7	32.1	6	224	324	386	0.2
7-1	670.0	152624	68	112	3.1	0.1	0.4	0.1	11.0	7	59.9	29.9	0.1	76.5	29.9	6	230	314	387	0.3
8-1	96.0	152872	74	36	0.3	0.2	0.2	0.1	9.3	9	63.4	13.8	T	78.9	33.9	6	260	337	380	0.4
9-1	20.0	153134	82	112	6.7	0.5	0.1	0.1	8.0	38	81.0	8.1	T	82.0	38.0	33	288	361	463	1.2
10-3	16.0	153321	60	42	2.7	0.2	0.2	0.1	12.5	23	68.3	8.6	T	75.4	31.5	22	256	319	403	1.3
11-1	20.0	153519	47	36	1.9	0.1	0.1	0.2	6.3	25	74.9	6.7	0.1	73.5	32.6	28	260	318	420	1.4
12-1	44.0	153706	33	19	0.7	0.1	0.2	0.2	6.1	10	74.9	7.4	0.1	80.0	34.1	12	268	340	406	0.4
12-30	24.0	153891	32.5	1	0.4	0.0	0.2	0.2	5.6	23	86.8	7.6	T	90.2	41.2	27	324	395	487	1.1
1961																				
2-1	20.0	154099	33	5	0.4	0.1	0.2	0.1	3.3	31	81.9	8.5	T	90.2	41.5	31	328	396	498	0.5
3-1	182.0	154297	43	16	0.9	0.1	0.2	0.1	5.9	9	73.6	19.3	T	78.8	26.8	19	244	307	395	0.1
3-31	459.0	154480	46	15	0.6	0.2	0.2	0.1	6.0	8	71.0	27.6	T	77.3	32.2	4	228	326	372	0.2
5-1	1180.0	154721	51	72	4.2	0.1	0.2	0.0	8.5	9	64.8	32.8	0.1	70.3	27.0	7	196	287	350	0.2
6-1	232.0	154943	67	29	1.4	0.1	0.2	0.1	4.3	10	67.3	26.2	T	78.6	29.8	6	228	319	377	0.2
6-30	222.0	155194	76.5	51	4.1	0.1	0.2	0.1	6.5	7	70.1	26.9	0.1	81.3	33.2	2	240	340	376	0.2
8-1	71.0	155351	81.5	60	3.1	0.1	0.3	0.1	9.0	8	54.9	9.8	0.3	74.5	32.2	7	258	319	346	0.4
9-1	16.0	155568	77	45	2.5	0.3	0.2	0.2	7.3	13	64.2	6.2	T	76.6	35.9	13	276	339	388	0.9
10-2	56.0	155734	56	36	1.5	0.1	0.2	0.1	8.5	18	69.5	15.4	T	73.3	30.0	14	228	307	362	0.7

*USGS average daily discharge

SANGAMON RIVER NEAR OAKFORD

The Sangamon River rises between Bloomington and Gibson City in the Bloomington Ridged Plain—South and flows through that region and into the Springfield Plain. The gaging station is located 1.8 miles northwest of Oakford, and the elevation of the gage datum is 452.88 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 5120 square miles.

The tabulation of water quality data is for the period from July 18, 1956, to September 23, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1956-1961 were reasonably similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 10.87 inches above normal to 6.09 inches below normal, based on records for five stations within the drainage basin. The average annual departure was +0.74 inch.

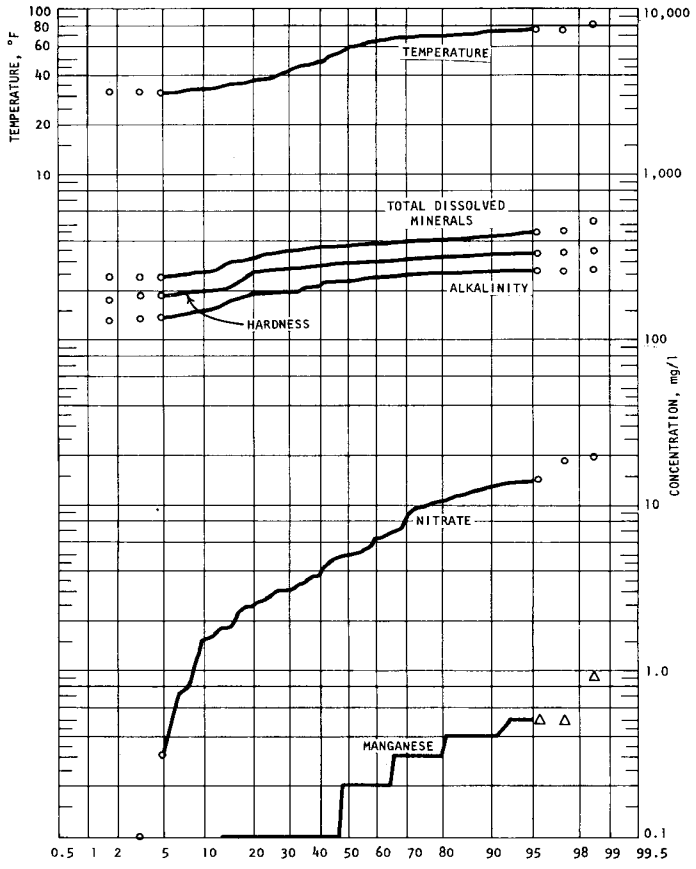
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.3 cfs/sq mi and was not less than 0.066 cfs/sq mi, with a median flow of 0.288 cfs/sq mi. The minimum average daily flow of record was 162 cfs in October 1954.

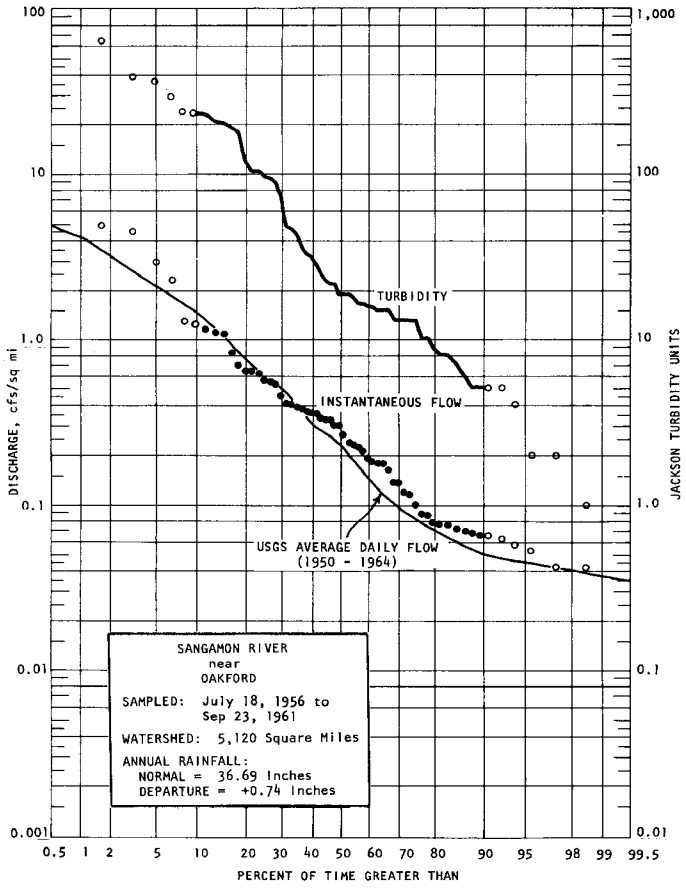
The turbidity was not less than 5 Jtu nor more than 240 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were over 80 F for 2 percent and over 70 F for 35 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	150	240	265
Hardness (as $CaCO_3$)	200	300	340
Total dissolved minerals	265	380	440
Nitrate	1.5	5	13.5
Manganese	T	0.2	0.4





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1956																				
7-18	2090.0	141067	74.5	394	18	0.9	0.1	0.0	9.2	12	43.6	7.1	0.1	46.1	18.2	10	144	191	264	
8-16	2710.0	141270	76	89	3.8	0.3	0.1	0.2	9.5	15	44.0	5.5	T	47.8	20.0	10	152	202	244	
9-19	316.0	141517	70	8	0.5	T	0.1	0.4	8.6	27	60.7	0.7	0.2	75.4	31.0	47	268	266	413	
10-16	216.0	141756	67	2	0.4	0.2	0.2	0.2	15.3	34	58.2	2.2	T	74.1	30.4	29	264	311	422	
11-15	212.0	141957	52.5	15	1.7	T	0.1	0.0	10.4	38	58.0	2.4	0.1	73.1	29.6	32	260	305	427	
12-20	365.0	142273	38	1	0.4	0.3	0.2	0.2	12.0	67	116.0	3.1	1.4	82.0	33.3	53	244	342	531	
1957																				
1-9	340.0	142299	36.5	2	0.4	0.2	0.2	0.1	11.3	31	68.1	4.8	0.9	75.2	26.4	29	244	297	415	
3-1	3250.0	142763	42	97	5.6	0.5	0.2	0.1	11.5	18	76.5	12.3	T	66.3	26.1	17	196	274	346	
6-6	4290.0	143631	72	240	7.2	0.5	Partial Sample										218	312	348	
7-11	3390.0	143954	75.5	106	2.9	0.1	0.3	T	14.4	11	61.5	9.8	T	67.0	28.9	9	218	287	352	
8-8	2890.0	144131	74	300	4.5	0.5	0.2	0.1	9.8	10	46.3	4.9	T	48.0	19.3	10	156	200	264	
9-30	335.0	144525	69.5	13	1.0	0.2	0.2	0.1	21.0	33	63.8	3.0	T	74.8	28.4	31	256	304	420	
10-10	294.0	144720	57	17	1.6	0.3	0.3	0.0	9.3	37	63.4	2.4	T	75.8	31.8	25	256	321	408	
11-16	598.0	145001	50	19	1.7	T	0.2	0.2	12.0	42	79.2	5.4	T	74.5	30.3	33	236	311	433	
12-18	986.0	145312	44	5	1.0	0.1	0.3	0.0	14.4	21	82.1	4.5	T	78.0	33.1	17	250	331	415	
1958																				
1-16	1860.0	145494	36.5	10	0.5	0.0	0.2	0.0	10.4	16	73.4	11.5	T	75.0	33.4	8	234	325	393	
2-28	1680.0	145883	41	28	3.4	0.1	0.3	0.1	13.4	24	69.9	10.6	T	69.0	29.6	17	216	294	352	
3-27	1990.0	146076	46	18	1.1	0.1	0.1	0.1	9.3	21	78.2	3.4	T	70.7	33.2	9	220	314	371	
4-21	1540.0	146457	62	19	1.6	0.1	0.2	0.1	7.7	14	72.8	3.6	T	74.2	34.9	10	252	329	382	
5-26	1540.0	146739	70	48	1.6	0.1	0.2	0.1	21.0	18	68.5	4.2	T	73.0	22.5	12	200	275	375	
6-17	15500.0	146985	72	370	9.7	0.3	0.1	0.1	9.9	9	50.4	7.0	T	46.9	14.2	20	148	176	256	
7-31	12100.0	147346	73	210	6.7	0.3	0.1	0.0	18.5	6	38.3	3.1	T	49.0	20.4	4	164	207	249	
8-25	1900.0	147543	72	13	1.8	0.1	0.1	0.1	13.5	18	57.4	6.8	T	77.0	32.8	12	264	328	392	
9-23	714.0	147777	69	22	1.5	0.2	0.2	0.1	9.0	26	64.6	3.7	T	72.0	31.8	22	252	311	395	
10-22	390.0	148091	54	5	0.4	0.2	0.1	0.1	11.7	34	62.5	1.5	0.1	75.6	33.1	26	268	325	418	
11-26	1080.0	148291	39.5	10	0.7	0.2	0.1	0.1	11.1	21	75.3	2.7	T	70.9	36.6	14	248	328	386	
12-13	850.0	148391	32	8	0.6	0.4	0.1	0.1	11.3	25	70.1	1.8	T	80.5	35.8	14	268	348	424	
1959																				
1-19	950.0	148689	32	16	0.4	0.2	0.1	0.1	11.5	50	74.1	5.0	T	76.6	29.5	36	240	313	455	
2-26	5960.0	148934	38.5	124	6.2	0.2	0.1	0.1	8.8	10	46.5	2.8	T	45.6	17.8	5	132	187	241	
3-20	6440.0	149087	47	75	2.8	0.1	0.1	0.0	9.4	13	64.6	0.3	T	66.3	28.5	1	196	283	325	
4-25	3300.0	149378	60	32	2.2	0.1	0.2	0.0	7.0	15	70.3	10.4	T	72.3	30.2	14	232	305	375	
5-23	1740.0	149677	66	194	6.1	0.4	0.2	0.1	14.5	18	64.0	1.8	T	69.6	27.7	17	232	288	371	
6-15	1150.0	149934	76	33	2.5	0.2	0.2	0.1	9.1	24	64.4	4.7	T	59.2	30.6	16	204	274	340	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1959																				
7-27	350.0	150140	76.5	23	1.6	0.5	0.3	0.1	9.8	34	56.0	2.6	T	63.4	26.5	34	234	268	371	
8-28	452.0	150475	82.5	15	3.9	0.1	0.3	0.1	20.2	20	43.8	3.7	T	51.5	19.9	19	176	211	302	
9-11	270.0	150621	70	13	0.8	0.4	0.3	0.1	8.3	38	58.4	3.0	0.0	68.8	29.9	26	234	295	396	
10-19	1840.0	150893	56.5	47	2.8	0.4	0.2	0.1	11.5	22	71.4	9.7	T	61.7	28.6	21	204	272	373	
11-11	9200.0	150989	46.5	6	1.2	0.1	0.3	0.1	10.0	36	121.8	5.0	T	72.2	31.0	32	196	308	449	
12-8	944.0	151233	35	5	0.4	0.1	0.2	0.1	7.2	32	67.9	5.1	T	71.6	30.6	27	244	305	398	
1960																				
1-26	1700.0	151501	32	22	0.7	0.0	0.2	0.0	8.7	31	81.9	8.4	T	73.2	33.6	21	232	321	408	1.0
2-23	2120.0	151728	32.5	25	1.0	0.0	0.2	0.1	9.6	20	75.9	12.5	T	77.0	34.0	17	252	333	414	0.5
3-8	1360.0	151819	33.5	16	0.6	0.1	0.2	0.0	8.7	40	81.9	14.3	T	77.0	34.5	29	244	335	439	1.0
4-3	23700.0	151979	47.5	182	6.5	0.3	0.2	0.0	8.4	10	57.4	12.7	T	48.9	20.1	9	140	205	281	0.3
4-12	5650.0	152061	49.5	106	3.8	0.1	0.3	0.0	8.9	16	69.1	18.7	T	66.4	27.4	11	192	279	354	0.5
5-16	2800.0	152259	64	19	1.9	0.1	0.2	0.0	7.6	19	72.2	10.0	T	77.1	32.4	14	248	327	402	0.5
6-13	3550.0	152428	70.5	650	18	0.4	0.2	0.1	9.5	19	57.6	0.8	0.1	62.0	25.8	14	204	261	318	0.2
7-7	6600.0	152728	72.5	205	6.2	0.2	0.4	0.1	10.8	12	54.1	13.4	T	59.8	23.4	12	188	246	308	0.5
8-18	704.0	153031	77	13	2.0	0.1	0.2	0.1	6.9	17	62.1	1.6	T	74.0	33.3	17	268	322	365	0.4
9-22	514.0	153279	67	13	1.8	0.1	0.2	0.2	10.2	21	63.8	3.3	T	72.8	29.8	27	264	305	394	0.7
10-11	356.0	153489	61	7	0.9	0.1	0.2	0.1	9.8	21	60.1	3.0	T	71.8	30.5	23	260	305	374	0.6
11-11	388.0	153600	39	15	0.7	0.3	0.2	0.1	10.5	32	64.0	6.3	0.1	73.9	30.2	31	260	309	407	1.8
12-15	598.0	153822	36	9	2.6	0.0	0.3	0.1	7.8	22	63.6	5.1	T	66.6	32.5	21	244	300	379	0.9
1961																				
1-9	444.0	154060	34	4	0.3	0.3	0.2	0.2	10.4	44	74.7	9.2	T	77.6	34.3	33	260	335	441	1.9
2-6	399.0	154193	34	5	0.6	0.4	0.1	0.2	9.8	41	75.1	10.5	T	78.5	34.9	35	272	340	461	2.1
3-17	5600.0	154353	45	232	7.6	0.4	0.2	0.1	8.9	14	70.8	19.8	T	69.0	27.4	13	204	285	345	0.4
4	2020.0	154613	55	17	1.1	0.1	0.2	0.1	6.1	20	75.9	11.6	T	78.0	33.3	17	252	332	400	0.7
5-15	25700.0	154832	66	235	7.4	0.1	0.2	0.0	9.6	8	42.8	14.5	0.1	47.2	17.5	6	136	190	241	0.3
6-23	2310.0	155086	72	43	2.5	0.1	0.2	0.1	10.4	15	60.7	13.8	T	72.1	29.1	11	228	300	363	0.6
7-21	1180.0	155304	77	94	5.2	0.3	0.3	0.0	6.4	24	44.6	6.5	0.1	54.9	22.3	16	179	229	311	1.0
8-21	1220.0	155527	74	36	1.6	0.2	0.2	0.1	10.3	16	70.8	6.3	0.1	66.7	27.2	23	228	279	389	0.6
9-23	639.0	155693	70	48	1.7	0.2	0.2	0.1	7.8	16	60.7	3.8	0.6	76.6	18.4	37	260	267	375	0.7

SEVEN MILE CREEK NEAR MT. VERNON

Seven Mile Creek rises in the Mt. Vernon Hills Region east of Mt. Vernon and flows south and westerly into the Big Muddy River. The gaging station is 3 miles east of Mt. Vernon, and the elevation of the gage datum is 436.76 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 21.5 square miles.

The tabulation of water quality data is for the period from November 9, 1961, to September 19, 1966. Discharge and quality data are also summarized graphically. No duration curve of average daily flows was available for comparison with instantaneous flows.

Annual rainfall during the period of sample collection was from 8.62 inches above normal to 11.08 inches below normal, based on records for one station within the drainage basin. The average annual departure was —5.78 inches.

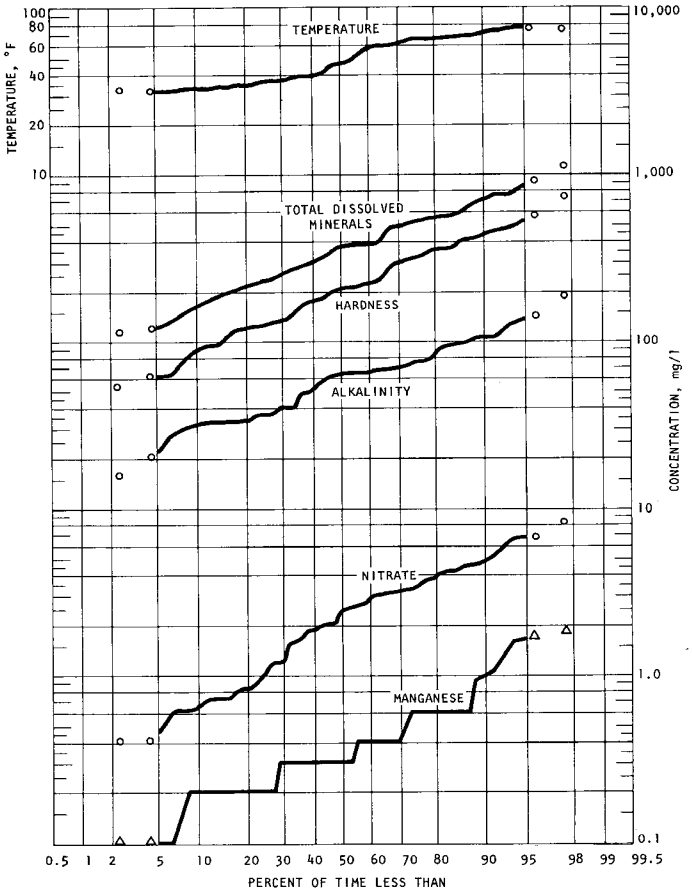
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 2.2 cfs/sq mi and was not less than 0.005 cfs/sq mi, with a median flow of 0.107 cfs/sq mi.

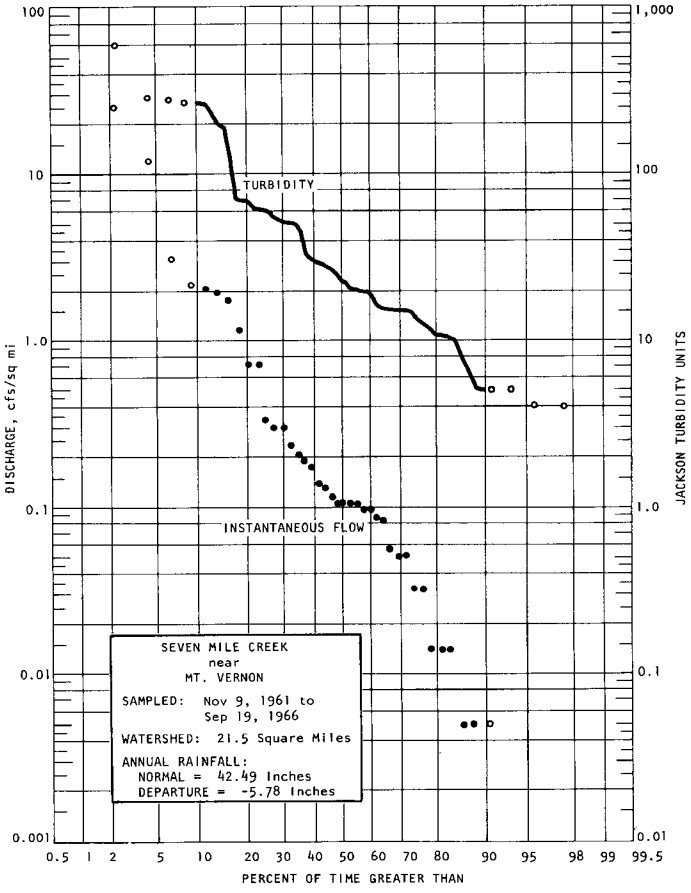
The turbidity was not less than 5 Jtu nor more than 270 Jtu for the central 80 percent of the time, with a median value of 25 Jtu.

Reported temperatures were never over 80 F and were over 70 F for 15 percent of the time. They were below 50 F for 55 percent and below 40 F for 35 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	30	65	110
Hardness (as $CaCO_3$)	90	210	440
Total dissolved minerals	160	380	710
Nitrate	0.6	2.4	4.8
Manganese	0.2	0.3	1.0





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
10-16		No sample taken, no flow																		
11-9	1.2	156094	39.5	4	0.3	0.2	0.2	0.1	12.4	25	319.0	2.6	0.1	82.0	39.2	33	68	366	574	0.1
12-7	7.2	156268	37.5	16	0.8	0.2	0.2	0.1	11.6	24	198.5	1.8	T	48.8	24.3	35	56	222	395	0.1
1962																				
1-26	261.0	156611	36	290	7.1	0.4	0.2	0.0	10.0	9	53.3	6.6	0.1	15.3	6.2	12	16	64	138	1.2
2-8	4.1	156701	32.2	4	0.4	0.4	0.2	0.0	12.0	22	209.8	1.8	T	49.0	26.9	38	64	233	394	0.0
3-13	15.8	157010	39	20	0.9	0.2	0.2	0.0	11.6	15	124.2	4.2	0.0	29.4	16.2	25	40	140	244	0.1
4-9	37.1	157214	47	50	2.9	0.3	0.2	0.0	10.7	14	83.5	3.4	T	21.2	9.5	23	32	92	192	0.1
5-10	1.9	157515	66	15	0.9	0.4	0.1	0.1	11.6	12	174.2	2.0	T	47.3	23.2	29	76	214	367	0.2
6-15	2.9	157815	69	63	2.7	0.2	0.1	0.0	8.2	14	136.4	1.7	0.1	39.8	17.9	23	60	173	282	0.1
7-17	2.5	158257	76	209	6.6	0.6	0.1	0.0	10.4	17	109.4	0.6	T	32.9	25.8	10	72	138	254	0.1
8-16		No sample taken, no flow																		
9-13		No sample taken, no flow																		
10-4	2.1	158704	58	58	2.5	0.3	0.2	0.1	8.8	9	105.5	1.2	0.1	27.6	12.2	20	40	119	213	0.2
11-8	1.1	158987	46	5	0.6	0.2	0.1	0.1	12.1	24	360.4	0.6	0.1	96.2	45.6	41	108	428	693	0.1
12-13	0.0	159183	34	21	1.0	0.4	0.2	0.1	8.7	29	638.5	1.0	0.1	170.4	82.2	62	192	764	1184	0.1
1963																				
1-11	5.0	159338	40.5	16	0.6	0.3	0.2	0.3	12.2	18	279.1	2.7	0.1	68.3	33.8	37	72	311	493	0.1
2-14	1.1	159547	33	11	0.3	0.2	0.2	0.1	11.2	19	410.6	3.0	0.1	102.4	50.6	46	108	464	747	0.1
3-14	6.5	159761	45	14	0.6	0.6	0.2	0.1	11.1	27	217.2	3.6	0.1	53.9	28.0	37	64	250	417	0.3
4-5	6.5	159919	50	17	0.6	0.2	0.2	0.0	11.4	18	187.4	1.6	0.1	47.4	23.7	34	68	216	384	0.1
5-10	0.7*	160145	70	15	0.6	0.6	0.2	0.0	8.4	15	249.5	1.9	0.2	68.0	33.6	30	100	308	492	0.1
6-11	2.2	160399	70	72	2.9	1.91	0.1	0.1	6.4	16	165.2	6.7	0.1	48.0	23.3	37	96	216	388	0.2
7-9	0.0	160620	66	274	10	.85	0.2	0.0	6.4	5	93.0	3.2	0.1	23.3	10.8	18	36	103	196	0.1
8-1	0.3	160844	76	51	2.7	.47	0.2	0.1	9.0	13	93.2	3.1	T	28.8	12.0	20	48	121	210	0.0
9-24		No sample taken, no flow																		
10-8		No sample taken, no flow																		
11-6		No sample taken, no flow																		
12-13	0.1	161857	35.5	27	1.0	1.06	0.1	0.1	11.0	17	406.1	3.2	0.1	87.8	44.9	36	34	404	630	0.1
1964																				
1-9	2.8	162010	32	30	1.3	.56	0.1	0.1	10.0	16	331.8	4.2	T	78.9	38.3	35	60	355	560	0.3
2-7	42.9	162216	38	53	2.7	.32	0.1	0.1	11.1	19	162.5	4.5	0.1	37.6	19.5	25	30	174	299	0.1
3-5	47.3	162359	40	73	4.7	.30	0.1	0.1	10.6	11	112.9	5.2	T	26.8	12.4	22	28	118	225	0.0
4-7	25.1	162634	60	21	1.3	.23	0.2	0.0	12.7	13	125.5	3.0	0.2	29.5	13.4	27	36	129	240	0.0
5-12	2.1	162949	68	45	4.1	.37	0.2	0.1	9.3	24	170.7	3.8	T	48.5	21.5	32	64	210	336	0.0
6-1	2.3	163102		33	1.4	.26	0.2	0.1	11.4	18	177.1	2.4	T	47.0	20.1	35	64	200	374	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
7-8	0.7	163477	76	295	6.5	.57	0.1	0.0	7.0	8	51.2	3.3	0.1	13.4	6.9	12	20	62	123	0.0
8-11		No sample taken, no flow																		
9-1		No sample taken, no flow																		
10-12		No sample taken, no flow																		
11-10		No sample taken, no flow																		
12-8	0.0	164815	36	23	1.1	.32	0.2	0.0	8.4	25	277.1	1.2	T	66.2	29.5	41	52	287	492	0.0
1965																				
1-13	2.2	165084	35	5	0.7	.06	0.1	0.2	13.5	22	313.3	2.6	0.1	77.5	34.9	41	68	337	552	0.2
2-25	3.4*	165277	33	10	1.3	.32	0.2	0.2	12.6	23	311.4	2.9	0.1	80.4	36.8	38	76	352	548	0.0
3-10	15.5	165550	41	16	0.7	.05	0.1	0.0	12.2	13	155.3	1.5	T	34.9	18.4	27	40	163	274	0.2
4-14	4.5	165689	55	13	0.6	.30	0.2	0.0	11.5	16	208.2	0.8	T	48.0	25.3	38	68	224	381	0.0
5-17		No sample taken, no flow																		
6		No sample taken, no flow																		
7-12	0.1	166652	74	62	3.8	.39	0.1	0.1	9.4	16	131.4	0.8	0.1	36.8	15.7	23	48	156	266	0.6
8																				
9-13	1.8	167211	68	31	1.9	.16	0.1	0.1	10.4	15	113.5	0.4	T	28.6	12.4	23	32	122	230	0.5
10-5	0.3	167330	58	7	0.6	.14	0.1	0.1	10.1	30	198.5	0.7	0.1	50.9	24.4	39	64	227	392	0.2
11-3	0.1	167531	47	20	1.0	.40	0.1	0.1	13.5	19	420.2	0.4	T	105.8	51.3	60	140	475	757	0.5
12-7	0.3	167828	37	199	12	1.60	0.2	0.0	14.7	30	519.6	0.7	T	123.2	63.7	63	124	570	908	0.1
1966																				
1-11	2.3	168096	34	5	0.2	.29	0.3	0.0	13.6	23	308.1	0.7	0.1	71.0	39.6	45	84	340	537	0.1
2-8	66.6	168247	32	24	1.4	.32	0.1	0.0	5.7	11	70.1	8.1	0.1	19.2	10.2	16	32	92	158	0.7
3-23	3.7	168601	56	11	0.6	.61	0.1	0.0	10.7	21	260.0	0.9	T	63.8	33.1	45	92	295	507	0.0
4-23	548.0	168755	59	6.11	43	1.69	0.1	0.1	7.6	10	68.7	4.6	0.0	21.3	7.3	19	36	83	172	0.2
5-25	45.0	169033	65	29	2.0	.30	0.1	0.0	13.4	13	153.0	2.0	T	42.0	19.0	31	68	183	310	0.0
6-21		No sample taken, no flow																		
7-30		No sample taken, no flow																		
8-25		No sample taken, no flow																		
9-19	3.0	169930	64	272	9.9	.61	0.1	0.0	4.6	7	38.7	2.5	T	15.2	3.9	14	32	54	117	0.3

*USGS average daily discharge

SKILLET FORK AT WAYNE CITY

The Skillet Fork rises in the Mt. Vernon Hills Region, west of Louisville, and flows south and east into the Little Wabash River. The gaging station is 1 mile north of Wayne City, and the elevation of the gage datum is 383.15 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 464 square miles.

The tabulation of water quality data is for the period from June 14, 1957, to September 18, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were generally greater than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 16.51 inches above normal to 7.29 inches below normal, based on one station record. The average annual departure was +4.13 inches.

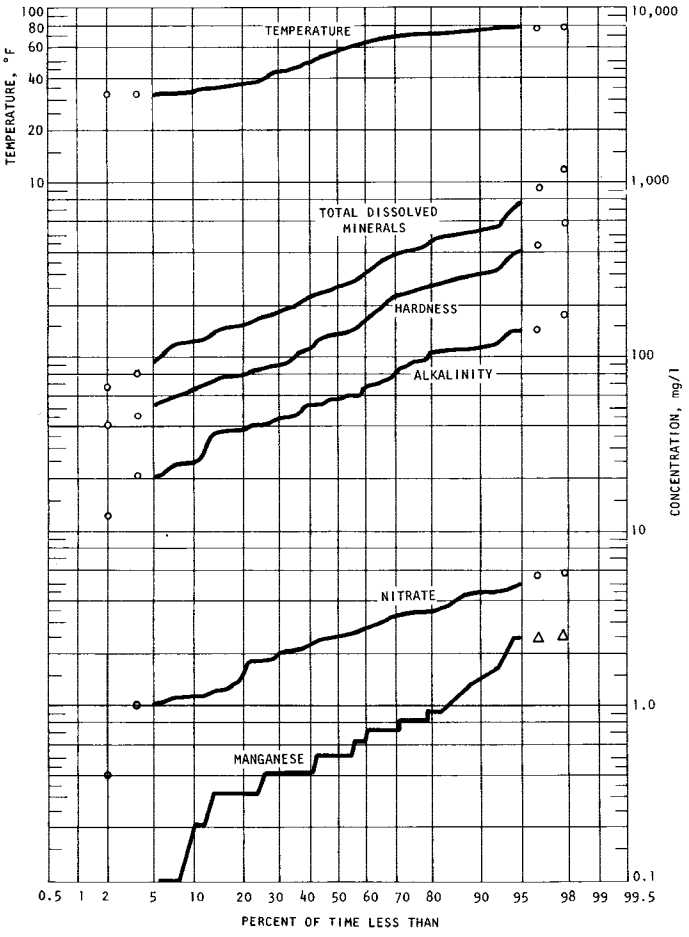
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 4.6 cfs/sq mi, and was not less than 0.0025 cfs/sq mi, with a median flow of 0.099 cfs/sq mi. The minimum average daily flow of record was 0 cfs in October 1953 and September 1954.

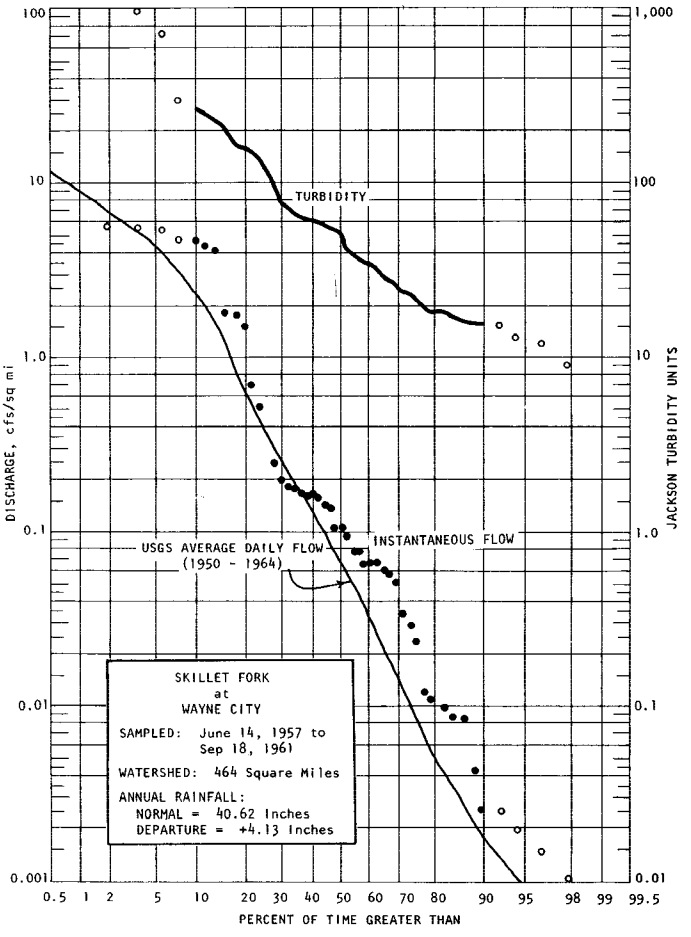
The turbidity was not less than 15 Jtu nor more than 270 Jtu for the central 80 percent of the time, with a median value of 50 Jtu.

Reported temperatures were never over 80 F and were over 70 F for 35 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	25	55	120
Hardness (as $CaCO_3$)	60	135	300
Total dissolved minerals	125	250	530
Nitrate	1.1	2.5	4.
Manganese	0.2	0.5	1.6





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-14	1950.0	143608	75	1000	12	0.7	0.2	0.1	5.4	9	24.9	2.6	0.1	11.9	2.4	9	20	40	79	
7-16	2080.0	143929	75	1650	22	1.4	0.2	0.0	4.4	9	23.9	1.8	0.2	11.5	3.8	3	12	45	66	
8-9	27.0	144159	74	165	0.4	0.4	0.2	0.0	7.2	30	41.9	3.2	T	22.0	7.9	21	44	88	167	
9-18	14.0	144485	68	61	3.6	0.4	0.2	0.2	5.8	19	36.2	1.8	T	19.2	7.3	15	44	78	153	
10-14	.5	144762	57	24	1.8	0.7	0.2	0.0	7.1	12	49.8	2.7	T	23.8	9.3	11	52	98	154	
11-20	2860.0	145114	47	158	6.2	0.2	0.1	0.1	7.9	11	40.3	2.8	T	16.0	6.7	6	20	68	123	
12-17	848.0	145301	45	725	18	1.3	0.1	0.0	8.4	94	109.8	3.8	T	35.5	18.2	64	52	164	378	
1958																				
1-14	50.0	145491	34	16	2.0	0.9	0.1	0.0	19.6	43	173.6	2.2	T	53.5	28.0	40	92	249	392	
2-12	50.0	145732	33	18	1.8	0.5	0.2	0.0	11.4	35	187.0	4.4	T	51.5	25.7	38	68	234	405	
3-13	876.0	145982	38	74	3.3	0.0	0.1	0.0	8.8	18	118.9	3.1	T	31.5	15.1	22	38	141	248	
4-16	77.0	146329	54	15	2.4	0.6	0.3	0.0	10.4	46	188.4	1.1	T	50.3	0.6	51	88	240	452	
5-19	31.0	146680	71	18	1.3	0.7	0.1	0.0	12.1	32	148.9	2.9	T	48.5	25.2	38	106	225	377	
6-24	46.0	146989	70	122	3.8	T	0.1	0.0	8.5	15	64.8	3.4	0.1	24.7	2.3	8	48	72	184	
7-23	2590.0	147274	73	210	4.4	0.1	0.1	0.0	8.5	12	26.3	1.2	T	13.9	5.5	5	24	58	99	
8-20	67.0	147508	74	43	3.2	0.4	0.2	0.0	7.3	15	40.1	2.4	T	18.5	8.8	18	40	83	148	
9-23	16.0	147760	68	70	1.3	0.5	0.1	0.0	7.6	15	52.2	2.0	T	21.0	6.7	19	44	80	173	
10-22	3.9	148008	59	12	1.3	0.8	0.1	0.0	8.6	31	72.0	1.5	T	30.4	13.1	28	72	130	232	
11-18	2300.0	148209	60	66	3.7	0.4	0.1	0.0	7.9	21	74.1	2.3	T	19.4	8.9	22	24	85	196	
12-11	85.0	148385	33	16	1.9	0.5	0.1	0.0	12.6	33	176.1	1.1	T	43.9	25.9	34	60	216	368	
1959																				
1-27	700.0	148730	33	39	3.0	0.4	0.1	0.1	8.5	24	125.1	1.2	T	31.3	16.1	28	40	144	271	
2-20	330.0	148902	32	300	5.6	0.5	0.1	0.1	10.8	26	156	1.8	T	38.4	21.2	32	52	183	340	
3-24	73.0	149155	48	13	1.9	0.3	0.1	0.0	10.4	38	199.3	1.0	T	53.6	28.9	43	84	253	431	
4-17	36.0	149330	60	22	2.1	0.1	0.1	0.0	6.4	41	228.3	2.4	T	60.6	39.0	72	120	312	529	
5-19	2180.0	149647	62	223	11	0.7	0.1	0.0	7.4	20	81.0	2.5	T	23.7	12.2	20	37	109	201	
6-26	5.7	149952	79	151	7.7	0.4	0.1	0.0	4.2	18	44.6	4.7	0.1	16.8	8.3	19	42	76	138	
7-27	1.2	150142	76	50	2.1	2.5	0.2	0.1	15.2	26	63.8	2.5	T	31.6	12.6	30	92	131	237	
8-24	24.0	150424	79	58	13	0.8	0.3	0.0	9.0	15	35.8	2.6	T	13.3	6.4	17	38	60	124	
9-24	3.9	150672	73	24	1.0	1.0	0.1	0.1	8.1	19	35.6	1.0	0.0	20.2	9.1	17	60	88	146	
10-16	77.0	150821	53	55	3.6	0.3	0.1	0.1	6.7	27	86.2	2.7	0.1	30.1	14.0	26	60	133	228	
11-10	28.0	150983	44	60	3.0	0.2	0.2	0.0	8.8	37	97.5	4.4	0.1	29.9	14.3	34	52	134	260	
12-15	2710.0	151236	41	97	4.8	0.4	0.2	0.0	7.2	14	61.9	4.4	0.1	18.2	7.7	18	28	77	175	
1960																				
1-6	92.0	151415	34	19	1.8	0.4	0.2	0.0	9.3	35	205.3	2.0	0.1	52.4	29.4	40	76	252	429	0.1
2-4	162.0	151610	37	51	1.4	0.3	0.2	0.0	8.9	48	224.4	3.3	T	53.8	30.5	43	68	260	478	0.1
3-15	79.0	151835	32	29	0.8	0.9	0.1	0.0	9.3	88	319.2	2.1	T	82.9	46.2	81	116	398	707	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
4-19	86.0	152071	62	64	2.1	0.5	0.2	0.0	6.0	49	221.7	0.4	T	62.4	32.8	54	108	291	499	0.0
5-17	31.0	152263	67	36	2.4	1.0	0.2	0.0	7.7	57	209.8	2.4	T	60.7	34.2	52	106	293	526	0.3
6-21	11.0	152526	77	250	6.2	0.7	0.1	0.0	8.8	23	65.2	5.5	0.1	23.2	10.9	27	57	103	202	0.2
7-28	36.0	152870	78	268	12	0.8	0.2	0.1	5.9	10	31.1	5.7	T	14.6	4.4	17	40	54	120	0.1
8-15	2.0	153025	80	28	1.5	1.6	0.2	0.0	5.8	97	35.6	1.9	T	25.6	9.7	60	60	104	272	0.2
9-12	0.7	153254	71.5	32	2.6	2.4	0.2	0.1	21.0	42	33.3	4.3	T	37.6	14.6	38	140	154	280	0.2
10-3	0.9	153373	68.5	36	1.2	2.4	0.2	0.1	4.7	42	27.2	3.2	T	31.6	11.4	35	112	126	220	0.1
11-7	1.2	153578	47.5	17	1.0	0.8	0.1	0.1	6.5	43	42.8	1.1	0.1	45.8	19.6	40	176	195	308	0.0
12-9	31.0	153761	38	145	7.1	0.3	0.1	0.1	5.7	60	60.3	3.3	0.1	21.5	8.0	45	36	87	233	0.2
1961																				
1-5	4.7	153938	35.5	16	1.3	0.5	0.2	0.1	8.4	230	311.8	1.3	T	97.2	47.2	148	108	437	927	0.0
2-10	5.3	154163	36	9	0.7	0.5	0.2	0.1	8.1	300	435.5	1.8	T	128.0	65.4	197	140	589	1245	0.1
3-3	116.0	154306	44	34	2.3	0.3	0.2	0.1	7.8	85	256.3	3.4	0.1	62.0	32.8	71	56	290	550	0.1
4-3	63.0	154567	49	28	2.3	0.6	0.2	0.0	9.5	75	213.5	2.0	T	58.5	31.0	59	72	274	506	0.2
5-16	245.0	154828	65	60	1.7	0.3	0.1	0.1	9.0	33	94.6	3.4	0.1	31.0	13.7	32	56	134	264	0.2
7-10	2.8	155290	76	27	1.0	1.6	0.2	0.1	10.5	40	88.7	0.9	0.1	42.0	17.5	35	104	177	309	0.1
8-17	19.0	155480	78.5	73	4.0	0.2	0.1	0.2	7.4	15	46.9	3.9	0.1	19.2	8.8	19	52	84	176	0.1
9-18	2.2	155689	69	36	1.8	1.4	0.2	0.0	6.6	106	60.7	2.7	0.1	31.7	12.3	61	48	130	333	0.0

SPOON RIVER AT LONDON MILLS

The Spoon River rises in the Galesburg Plain Region east of Kewanee and flows southward to its junction with the Illinois River. The gaging station at London Mills is on the downstream side of the highway bridge, and the elevation of the gage datum is 508.97 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 1070 square miles.

The tabulation of water quality data is for the period from June 27, 1957, to September 13, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were reasonably similar to those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 5.23 inches above normal to 8.58 inches below normal, based on records for three stations within the drainage basin. The average annual departure was +0.35 inch.

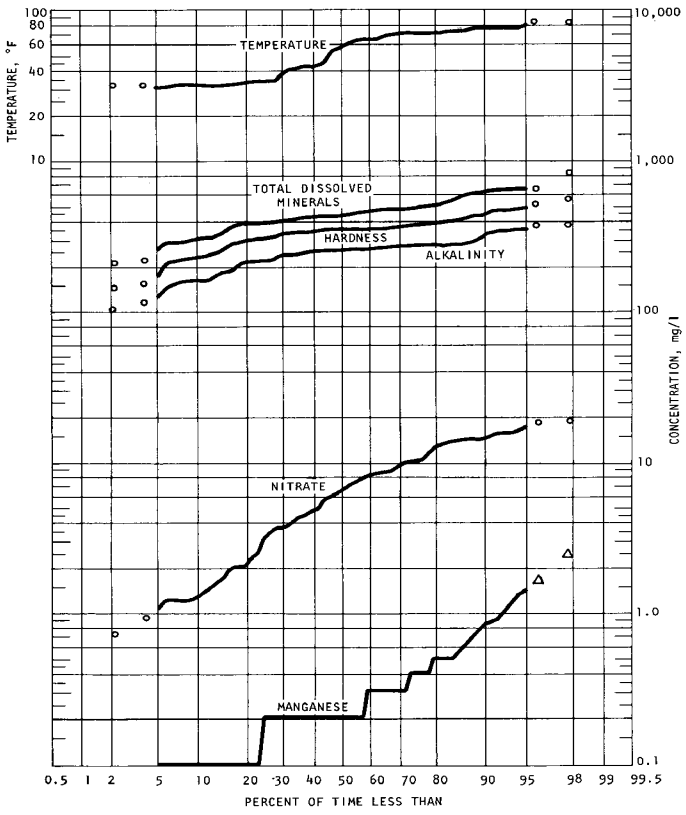
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.8 cfs/sq mi and was not less than 0.032 cfs/sq mi, with a median flow of 0.2 cfs/sq mi. The minimum average daily flow of record was 5.2 cfs in September 1963.

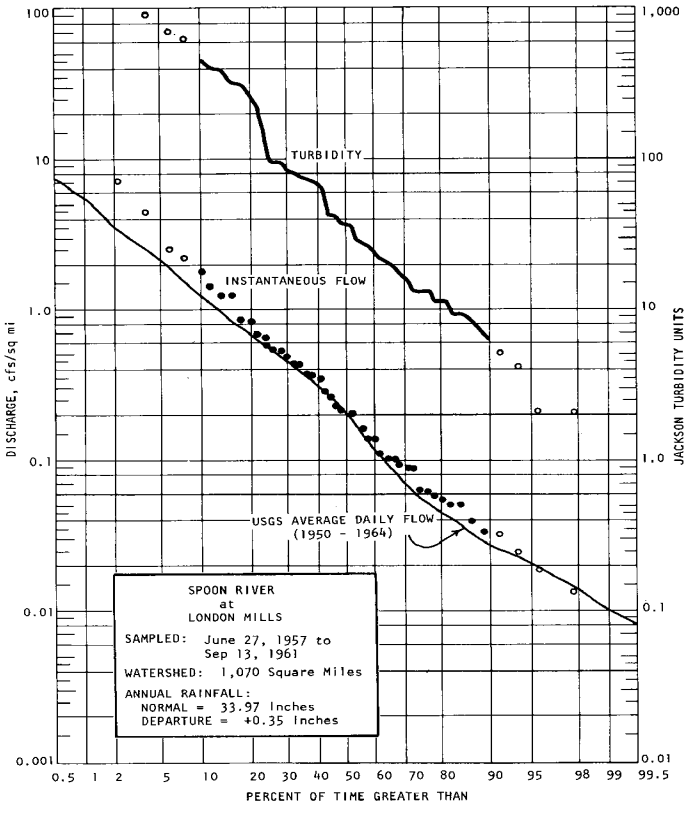
The turbidity was not less than 6 Jtu nor more than 470 Jtu for the central 80 percent of the time, with a median value of 35 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 35 percent of the time. They were below 50 F for 45 percent and below 40 F for 30 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	160	270	320
Hardness (as $CaCO_3$)	230	350	450
Total dissolved minerals	320	440	620
Nitrate	1.3	6.5	10.5
Manganese	0.1	0.2	0.8





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-27	359.0	143721	70	93	4.6	0.1	0.3	0.0	8.5	14	86.2	13.5	T	78.0	30.7	16	236	322	391	
8-15	50.0	144190	78	20	0.9	0.2	0.3	0.0	8.3	23	79.4	1.2	T	67.5	33.1	22	236	305	386	
9-19	20.0	144651	70	2	1.3	0.3	0.3	0.2	3.7	27	116.4	1.6	T	79.9	37.1	33	264	353	454	
11-27	94.0	145234	41	27	1.4	0.3	0.3	0.1	11.5	25	131.2	8.4	T	94.0	38.9	22	264	395	514	
12-19	454.0	145319	34	400	13	0.8	0.3	0.3	7.5	32	128.6	5.6	0.2	87.0	34.9	34	252	361	484	
1958																				
1-14	190.0	145496	32	13	0.6	0.2	0.3	0.1	10.2	21	127.5	10.1	T	91.0	38.9	25	272	387	496	
2-27	4660.0	145900	35	1380	61	2.4	0.2	0.1	7.8	7	40.7	9.5	T	37.5	11.6	8	100	142	202	
3-27	226.0	146141	44	9	1.0	0.1	0.3	0.1	7.3	17	101.8	3.9	T	85.5	36.3	14	260	364	442	
4-25	298.0	146478	55.5	11	4.0	0.3	0.3	0.1	4.6	16	114.0	3.2	T	79.8	36.0	16	238	348	432	
5-26	110.0	146768	73	17	1.5	0.2	0.3	0.1	9.1	19	93.4	3.6	0.1	81.5	36.4	22	276	354	435	
6-26	359.0	147061	66	82	10	0.2	0.2	0.1	19	13	102.2	14.2	T	89.8	34.0	15	262	365	450	
7-8	718.0	147114	73.5	310	4.0	0.4	0.2	0.2	14.6	11	85.6	6.1	T	86.3	29.7	7	244	338	408	
8-22	209.0*	147506	71	23	1.6	0.1	0.2	0.1	10.4	19	119.1	4.2	T	80.3	34.8	57	284	344	499	
10-22	61.0	148023	59.5	13	1.3	0.3	0.2	0.1	8.1	21	131.4	0.7	T	89.1	43.3	23	284	401	524	
11-10	51.0	148187	41	2	0.7	0.2	0.2	0.1	9.4	31	156.3	1.2	T	102.1	43.7	37	308	435	607	
12-18	26.0	148557	32.5	4	0.4	0.2	0.3	0.1	14.3	50	250.7	1.3	T	132.0	54.7	63	380	555	819	
1959																				
1-29	35.0	148966	32.5	9	0.9	0.5	0.3	0.2	10.5	40	179.6	2.0	T	103.0	43.4	48	296	436	645	
2-27	2620.0	149047	34.5	380	21	1.3	0.1	0.0	9.0	9	43.4	1.4	T	39.6	12.4	11	116	150	220	
3-30	554.0	149238	44.5	70	5.1	0.3	0.1	0.1	10.0	10	103.7	11.5	T	81.9	33.8	6	224	344	412	
4-30	1500.0	149488	58	289	18	0.9	0.1	0.1	10.8	11	80.4	14.3	T	78.4	27.7	8	216	310	382	
5-26	384.0	149783	72	93	4.4	0.2	0.3	0.1	10.8	14	92.6	8.4	T	83.9	35.4	17	269	355	423	
6		Lost in Transit																		
7-29	95.0	150297	83.5	72	3.5	0.1	0.2	0.1	9.1	15	72.8	4.8	T	60.6	20.3	19	176	235	329	
8-18	148.0	150379	78	78	4.6	0.2	0.3	0.1	5.9	20	85.8	2.4	T	56.6	19.3	26	158	221	319	
9-10	14.0	150586	72	41	4.2	0.4	0.3	0.2	4.5	25	163.7	2.2	T	92.4	41.6	32	264	402	551	
10-8	2290.0	150784	60.5	700	42	1.6	0.1	0.0	11.0	9	71.2	13.7	0.1	55.1	19.0	12	144	216	296	
11-23	505.0	151097	33	38	2.6	0.2	0.2	0.1	9.0	17	96.9	8.7	T	85.6	30.6	24	260	340	442	
12-15	535.0	151274	39	55	3.3	0.2	0.3	0.1	9.8	12	91.5	8.5	T	86.6	33.9	12	264	356	423	0.3
1960																				
1-19	1280.0	151500	32	205	8.1	0.3	0.2	0.0	10.9	12	83.1	15.3	T	82.8	33.8	10	252	346	401	0.2
2-23	450.0	151729	32.5	26	6.3	0.1	0.2	0.1	11.2	15	102.9	15.7	T	92.0	38.8	18	288	390	487	0.2
3-10	390.0	151820	32	29	1.5	T	0.2	0.1	9.4	16	94.0	13.0	T	89.9	35.6	16	276	372	465	0.1
4-3	7620.0	151975	43	312	14	0.4	0.2	0.0	9.0	7	60.9	18.9	T	59.4	20.2	10	164	232	317	0.2
5-24	1280.0	152352	66	81	6.1	0.2	0.3	0.1	11.4	11	85.4	18.1	0.1	81.4	32.7	9	239	338	395	0.3
6-23	2450.0*	152569	69	450	24	0.6	0.2	0.0	10.9	8	75.7	7.6	T	73.0	29.3	7	222	303	372	0.2

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
7-27	855.0	152895	75.5	900	24	0.8	0.2	0.1	8.3	9	83.3	10.0	0.1	25.0	25.0	6	156	249	293	0.3
8-31	168.0	153169	78	13	1.3	T	0.3	0.1	10.1	14	102.6	3.5	0.1	85.5	36.7	22	284	365	472	0.1
9-23	91.0	153292	66.5	19	1.5	0.1	0.2	0.2	6.9	22	120.3	4.3	T	80.1	36.2	31	256	349	486	0.2
10-15	65.0	153463	65	15	1.0	0.2	0.2	0.1	3.6	21	129.6	0.9	T	82.7	40.1	32	276	372	465	0.4
11-30	108.0	153720	34.5	11	0.6	0.1	0.3	0.1	12.5	18	121.4	6.5	T	91.4	39.8	23	284	392	512	0.3
12-28	67.0	153935	32.5	5	0.2	0.2	0.2	0.2	7.1	31	172.8	6.2	T	114.2	49.5	40	348	489	624	0.2
1961																				
2-1	42.0	154132	32	8	0.5	0.5	0.4	0.2	5.4	36	172.6	7.1	T	120.4	52.8	43	376	518	655	0.1
2-9	57.0	154199	34	7	0.3	0.5	0.3	0.5	7.3	40	156.1	10.0	0.1	110.4	48.2	43	340	474	657	0.2
3-14	880.0	154352	44	615	18	0.7	0.2	0.1	8.9	11	98.7	12.5	T	76.1	27.8	16	212	305	385	0.4
4-18	278.0	154710	47.5	22	1.1	0.2	0.2	0.1	4.6	16	100.0	6.8	0.1	81.1	36.0	17	256	351	449	0.2
5-4	241.0	154751	61	36	1.7	0.2	0.3	0.1	5.7	18	97.5	8.1	T	84.7	37.8	18	272	367	451	0.2
6-6	115.0	154982	72	41	1.8	0.1	0.2	0.0	5.8	16	94.2	5.7	T	86.6	34.9	21	280	360	440	0.3
7-26	146.0	155386	82	36	3.6	0.1	0.2	0.2	8.5	22	108.0	3.6	0.1	69.2	28.5	20	188	290	389	0.3
8-29	34.0	155570	76	66	1.4	0.2	0.2	0.1	3.2	29	97.1	2.0	0.1	74.0	38.4	35	276	343	453	0.2
9-13	215.0	155652	75.5	100	4.7	0.3	0.2	0.2	2.8	36	108.2	4.7	0.1	65.3	29.5	41	208	285	425	0.4

*USGS average daily discharge

VERMILION RIVER AT LOWELL

The Vermilion River rises in the Kankakee Plain Region between Gilman and Forrest and flows northwesterly to its junction with the Illinois River. The gaging station is 0.2 miles north of Lowell, and the elevation of the gage datum is 500.61 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 1230 square miles.

The tabulation of water quality data is for the period from May 28, 1957, to October 6, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-1961 were generally higher than those indicated by the USGS average daily flow records during 1950. 1964. Annual rainfall during the period of sample collection was from 9.23 inches above normal to 4.98 inches below normal, based on records for one station within the drainage basin. The average annual departure was negligible.

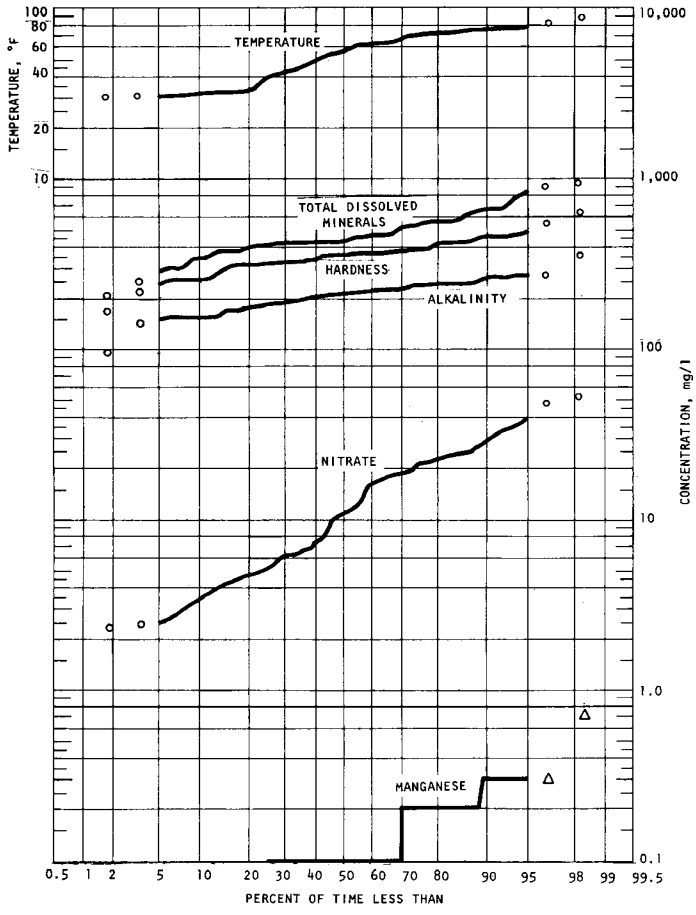
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.4 cfs/sq mi and was not less than 0.019 cfs/sq mi, with a median flow of 0.220 cfs/sq mi. The minimum average daily flow of record was 5 cfs in February 1961.

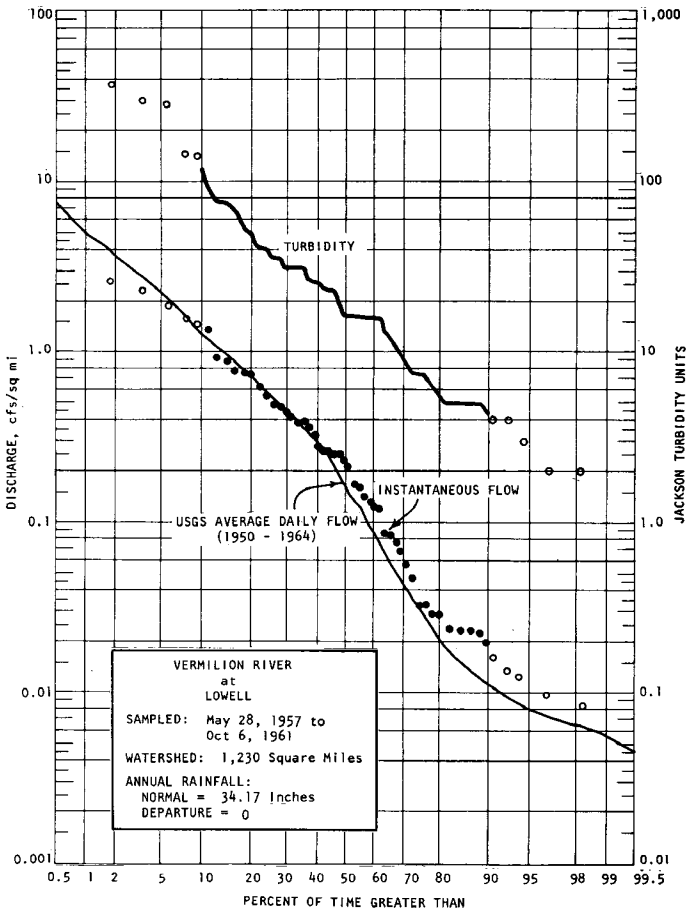
The turbidity was not less than 4 Jtu nor more than 120 Jtu for the central 80 percent of the time, with a median value of 20 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 30 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	150	220	265
Hardness (as $CaCO_3$)	250	360	470
Total dissolved minerals	310	440	660
Nitrate	2.8	11	27
Manganese	0	0.1	0.3





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
5-28	1130.0	143513	63	31	1.8	0.1	0.3	0.0	8.0	13	103.9	35.1	T	77.7	34.4	8	198	336	441	
6-25	930.0	143722	71	290	4.5	0.1	0.3	0.1	7.6	8	74.5	26.6	0.1	60.0	26.2	6	158	258	311	
7-16	1780.0	143949	75	375	5.1	0.2	0.3	0.0	10.7	7	61.1	16.3	T	54.5	21.8	3	146	226	263	
8-13	94.0	144208	77	4	T	0.1	0.5	0.1	0.7	13	140.5	5.4	T	54.0	40.0	14	160	300	380	
9-10	27.0	144447	66	25	1.5	0.3	0.5	0.4	6.7	28	278.7	3.0	T	89.5	52.2	36	184	438	645	
10-11	17.0	144840	50	5	0.6	T	0.6	0.5	2.3	43	313.5	3.6	T	90.5	56.2	55	188	457	694	
11-20	790.0*	145135	41	145	3.7	0.1	0.3	0.0	9.5	12	99.4	13.9	T	66.2	29.9	3	164	288	373	
12-10	324.0	145274	34	6	0.9	0.0	0.3	0.1	6.4	13	140.3	5.3	0.2	86.5	40.5	10	236	383	480	
1958																				
1-23	470.0	145575	32	2	0.4	0.7	0.3	0.1	5.3	13	123.2	18.2	T	80.5	38.2	11	222	358	437	
2-19	150.0	145802	31.5	3	0.5	T	1.2	0.1	4.7	22	174.6	7.2	T	99.8	51.2	14	272	460	563	
3-26	281.0	146143	43	5	0.9	0.1	0.3	0.1	7.7	13	127.1	8.0	T	72.5	39.4	6	200	344	431	
4-22	404.0	146370	58	16	1.6	0.1	0.4	0.1	2.2	13	123.8	6.7	0.1	75.2	37.0	9	206	340	418	
5-26	206.0	146737	74	5	0.3	0.1	0.3	0.1	2.3	15	127.5	5.6	T	71.0	39.1	17	216	338	436	
6-17	2950.0	146920	64.5	300	8.3	0.3	0.3	0.1	11.2	6	64.4	11.6	T	63.7	24.5	0	176	260	316	
7-23	1660.0	147280	65.5	40	2.5	0.1	0.3	0.1	18.3	8	86.4	6.7	T	80.6	32.0	8	244	333	421	
8-19	4350.0	147505	74	16	1.0	T	0.3	0.1	10.5	13	106.6	10.8	T	84.0	37.9	17	264	366	452	
9-26	56.0	147814	70.5	32	1.0	0.2	0.4	0.2	5.3	22	169.9	4.7	T	68.8	44.5	34	216	355	504	
10-24	28.0	148022	55	8	0.7	0.1	0.3	0.2	2.8	29	199.5	4.9	T	98.1	43.7	38	256	425	579	
11-19	177.0	148232	51	12	1.4	0.2	0.1	0.2	5.8	24	175.3	2.6	T	87.0	43.5	26	240	397	530	
12-16	40.0	148535	31	5	0.8	0.1	0.4	0.3	9.7	14	202.8	6.4	T	106.7	47.8	18	272	465.8	556	
1959																				
1-15	100.0		32.5	Broke bottle--no sample																
2-23	2320.0	148964	33	144	8.9	0.2	0.1	0.1	8.2	7	53.9	2.6	T	39.4	18.4	32	96	174	217	
3-20	882.0	149182	42	41	2.5	0.1	0.2	0.0	8.4	10	94.8	16.5	T	72.5	34.4	1	200	323	380	
4-15	490.0	149339	52.5	19	1.3	0.1	0.2	0.1	1.1	16	107.6	17.3	T	74.2	38.5	8	212	344	404	
5-14	590.0	149619	61.5	23	1.1	0.1	0.3	0.1	6.8	1.1	103.3	18.1	T	80.0	33.3	6	212	337	393	
6-17	260.0	149933	76.5	16	1.0	0.1	0.4	0.1	7.6	15	119.9	21.4	T	82.4	35.5	24	242	352	487	
7-22	36.0	150298	80	35	1.8	0.2	0.6	0.1	5.8	31	188.4	3.8	T	91.2	41.3	39	240	398	582	
8-12	22.0	150377	78	32	2.1	0.2	0.7	0.2	7.0	33	197.1	4.0	T	89.9	41.8	40	230	397	578	
9-11	12.0	150587	60	26	2.1	0.1	1.0	0.2	7.1	34	179.6	4.4	0.1	82.1	37.3	35	196	359	530	
10-1	169.0	150751	62	69	4.5	0.3	0.4	0.1	5.3	15	97.9	3.3	T	55.7	25.9	20	164	246	339	
11-18	325.0	151011	31.5	7	0.8	0.0	0.4	0.1	5.7	13	130.2	11.0	T	85.2	39.6	14	244	376	472	
12-16	515.0	151272	38.5	13	0.8	0.1	0.5	0.1	8.3	12	121.2	12.7	T	82.6	43.4	9	232	365	454	1.8
1960																				
1-14	3140.0		43	Sample received broken (frozen)																
2-4	660.0	151605	34	16	0.6	T	0.6	0.0	5.9	13	111.9	19.3	T	80.8	37.8	10	228	358	425	1.4

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
3-15	310.0	151841	32.5	9	0.4	T	0.8	0.1	6.1	14	120.3	22.4	T	84.4	39.5	10	232	374	461	1.7
4-15	950.0	152074	55	51	2.4	0.1	0.4	0.1	6.7	12	111.9	22.1	T	81.3	35.3	7	212	349	442	1.0
5-4	565.0	152220	61.5	6	0.4	T	0.3	0.1	2.7	13	115.2	23.8	T	79.7	38.2	12	224	357	409	0.7
6-22	1890.0	152567	66	99	4.7	0.1	0.3	0.1	9.8	8	86.2	25.9	0.1	79.8	33.9	5	228	339	414	0.1
7-21	302.0	152869	78.5	7	0.3	T	0.7	0.2	10.3	12	114.4	21.2	T	86.1	38.9	9	242	376	444	3.3
8-9	194.0	153021	81	77	4.1	0.3	0.5	0.3	6.4	15	133.1	10.4	T	72.9	36.8	20	208	334	440	1.3
9-7	28.0	153185	89	35	2.2	0.1	0.6	0.1	2.0	30	209.6	2.5	T	94.4	47.4	42	260	431	622	1.1
10-20	15.0	153496	49	11	0.6	0.1	0.7	0.1	3.3	42	261.7	6.3	T	89.5	54.5	57	236	448	695	0.9
11-4	40.0	153576	45.5	16	3.1	0.0	2.5	0.5	12.9	61	294.0	47.8	0.1	106.8	52.3	61	184	482	799	33.5
12-7	36.0	153775	34.5	5	0.5	0.1	0.6	0.4	7.8	41	238.0	24.2	T	96.8	50.8	56	248	451	668	9.7
1961																				
1-9	10.0	154015	32	2	0.4	0.1	0.9	0.4	8.1	57	324.6	52.9	0.1	132.0	55.7	76	264	559	910	18.0
2-7	20.0	154178	32.5	4	0.4	0.2	0.6	0.9	5.6	56	336.9	30.0	0.1	145.6	66.9	80	360	639	951	5.6
3-7	69.0	154304	43	16	0.9	0.3	0.3	0.4	4.6	28	171.3	12.0	0.1	79.9	36.7	35	200	351	527	3.2
4-5	159.0	154529	47.5	25	1.9	0.2	0.4	0.1	1.6	15	133.7	18.4	T	82.6	39.0	17	228	367	455	2.4
5-2	565.0	154753	56.5	31	1.5	0.1	0.2	0.1	6.3	13	111.1	34.0	0.1	80.7	36.2	14	220	351	450	1.8
6-1	302.0	154947	71	9	0.6	0.0	0.4	0.1	1.2	13	122.8	19.1	T	78.4	39.9	12	224	360	426	0.9
7-5	91.0	154233	74	24	3.2	0.2	0.4	0.2	0.9	17	164.6	9.5	0.1	62.8	43.0	20	176	334	426	0.5
8-3	107.0	155388	80	75	4.3	0.1	0.4	0.2	4.0	15	117.9	7.2	0.1	55.3	29.3	18	148	259	343	1.3
9-5	28.0	155619	77	47	3.3	0.2	0.4	0.3	8.6	36	191.9	4.2	T	68.8	37.2	50	180	325	491	0.8
10-6	950.0*	155839	61.5	23	1.4	0.1	0.2	0.2	10.2	8	97.7	23.8	T	88.0	37.5	3	248	374	419	1.2

*USGS average daily discharge

VERMILION RIVER AT PONTIAC

The Vermilion River rises in the Kankakee Plain Region between Gilman and Forrest and flows northwesterly to its junction with the Illinois River. The gaging station is near the center span of the Vermilion Street Bridge in Pontiac, and the elevation of the gage datum is 619.45 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 568 square miles.

The tabulation of water quality data is for the period from June 5, 1957, to September 27, 1961. Discharge and quality data are also summarized graphically.

Instantaneous flow measurements for samples collected during 1957-l961 were generally higher than those indicated by the USGS average daily flow records during 1950-1964. Annual rainfall during the period of sample collection was from 9.23 inches above normal to 4.98 inches below normal, based on records for one station within the drainage basin. The average annual departure was negligible.

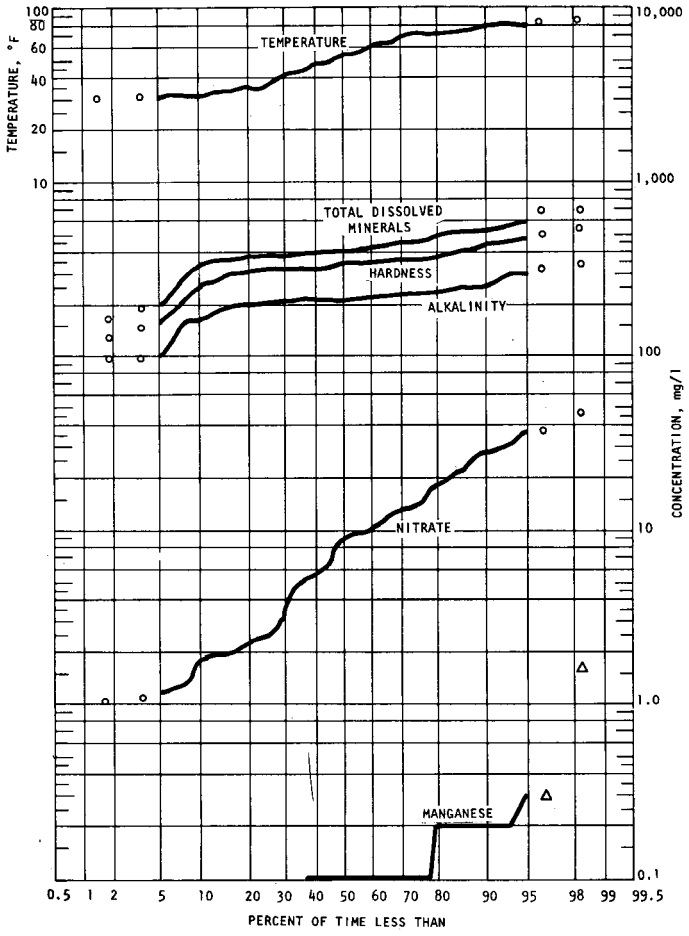
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 1.15 cfs/sq mi and was not less than 0.015 cfs/sq mi, with a median flow of 0.193 cfs/sq mi. The minimum average daily flow of record was 0.1 cfs in September 1954.

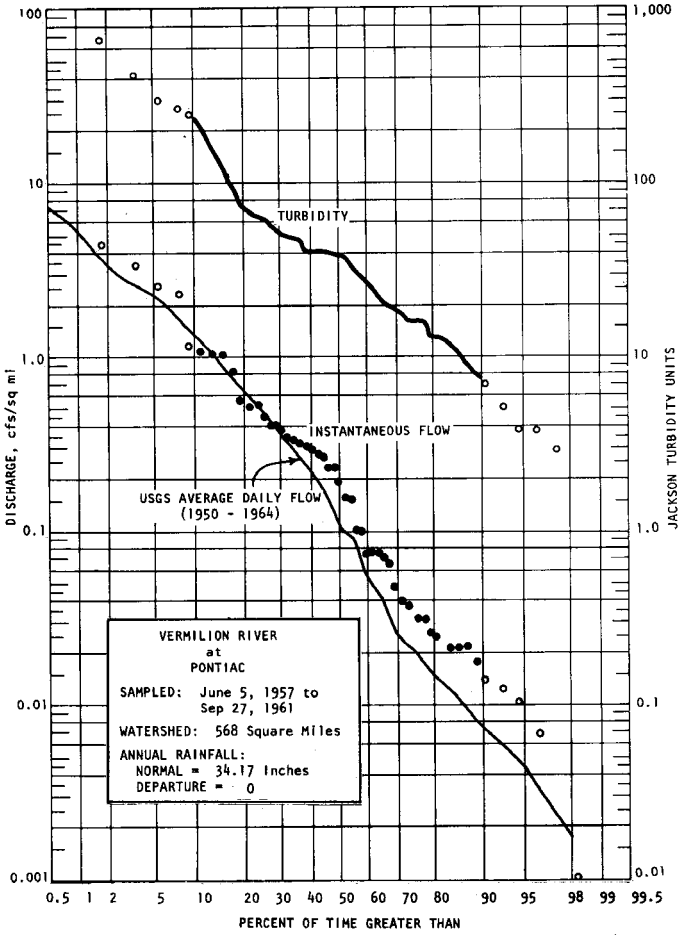
The turbidity was not less than 8 Jtu nor more than 250 Jtu for the central 80 percent of the time, with a median value of 40 Jtu.

Reported temperatures were over 80 F for 12 percent and over 70 F for 30 percent of the time. They were below 50 F for 40 percent and below 40 F for 28 percent of the time.

The analyses indicated the following:

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	170	220	260
Hardness (as $CaCO_3$)	270	350	440
Total dissolved minerals	330	430	520
Nitrate	1.8	9.0	28
Manganese	T	0.1	0.2





Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1957																				
6-5	230.0	143558	73.5	34	1.4	T	0.2	0.2	7.8	8	112.1	37.3	T	81.4	33.2	11	206	340	415	
7-5	462.0	143771	73	231	3.2	T	0.4	0.1	7.8	7	95.9	36.0	0.1	79.0	34.2	7	216	338	429	
8-15	42.0	144210	80.5	40	0.6	0.0	0.2	0.1	5.5	9	134.7	5.2	T	88.5	42.0	4	248	394	467	
9-11	10.0	144417	72	32	1.9	T	0.3	0.0	5.5	12	171.8	2.2	T	81.4	42.8	33	204	379	507	
10-17	7.2	144771	58	30	1.4	0.2	0.1	0.1	5.6	28	215.0	2.5	0.0	93.0	53.7	1	240	454	593	
11-14	60.0	144990	46	24	0.9	T	0.2	0.2	5.8	11	154.1	5.6	T	86.0	40.3	13	228	381	451	
12-11	100.0	145269	32	20	1.0	0.1	0.1	0.2	7.8	10	112.5	13.4	T	77.0	36.7	7	216	343	425	
1958																				
1-15	182.0	145487	34.5	4	0.4	T	0.2	0.1	6.7	8	112.1	17.7	T	80.0	37.7	3	220	355	425	
2-26	300.0	145855	36	300	6.8	0.2	0.2	0.0	5.2	6	57.0	8.7	T	88.5	17.5	1	96	169	213	
3-28	234.0	146119	42.5	38	2.4	0.1	0.3	0.1	3.5	9	109.0	9.5	T	72.5	35.4	6	206	327	399	
4-24	300.0	146373	56	50	2.7	0.2	0.3	0.1	3.5	10	105.3	8.6	T	72.7	37.9	2	212	338	389	
5-27	58.0	146740	71.5	39	1.7	T	0.1	0.1	11.7	8	117.0	5.1	T	79.6	40.4	4	236	365	398	
6-25	570.0	146959	66.5	255	7.5	0.0	0.3	0.1	12.8	6	93.2	10.4	T	73.9	32.8	3	212	320	383	
7-24	650.0	147278	74	60	3.8	0.1	0.3	0.0	11.3	6	85.0	10.9	T	82.4	35.4	3	252	352	407	
8-13	257.0	147441	80	21	1.2	T	0.3	0.1	11.4	5	80.6	13.4	T	79.0	30.8	14	252	324	406	
9-17	40.0	147720	66	48	1.4	0.1	0.3	0.1	6.0	8	141.7	1.9	T	73.1	42.3	9	216	357	427	
10-15	12.0	147964	65	16	0.9	0.1	0.1	0.1	6.4	11	170.3	2.4	T	83.3	48.3	14	244	407	511	
11-5	15.0	148102	52	12	1.0	0.1	0.1	0.2	6.5	35	177.7	1.3	T	92.3	48.8	27	256	432	576	
12-17	14.0	148493	33.5	13	1.3	0.2	0.3	0.2	6.7	11	155.9	1.8	T	106.2	48.8	15	308	454	529	
1959																				
1-14	18.0	148670	36	4	1.6	0.1	0.1	0.1	2.9	16	159.4	3.0	T	92.0	60.8	8	312	480	527	
2-18	600.0	148883	34	63	3.9	0.2	0.1	0.0	6.4	8	47.9	1.0	0.1	37.3	13.3	7	100	148	201	
3-19	195.0	149083	43	75	2.9	0.1	0.1	0.1	7.6	9	92.2	9.9	T	75.9	34.5	0	216	332	371	
4-23	325.0	149344	55	41	1.5	T	0.2	0.0	6.4	11	98.9	9.7	0.1	80.1	28.6	11	216	318	391	
5-20	171.0	149645	71	69	6.8	0.2	0.3	0.1	5.9	10	105.9	13.8	T	77.2	38.4	22	230	351	443	
6-24	42.0	149930	81	52	5.7	1.6	0.3	0.1	5.0	10	129.6	9.8	0.1	74.2	41.2	18	238	355	455	
7-30	42.0	150262	84	160	8.9	0.3	0.2	0.1	5.9	3	34.6	4.6	T	33.3	11.7	6	100	131	172	
8-19	18.0	150375	87	39	2.2	0.2	0.3	0.1	4.9	15	131.4	1.9	T	64.7	36.2	17	188	311	411	
9-17	.6	150624	57	25	1.5	0.2	0.3	0.2	6.3	34	169.7	3.0	0.0	70.6	44.1	41	220	358	530	
10-15	121.0	150799	52	63	2.7	0.1	0.2	0.0	10.5	7	82.9	14.0	0.1	66.3	28.5	9	196	283	359	
11-5	89.0	150947	50	5	0.3	T	0.3	0.1	6.1	9	117.0	12.7	T	81.0	37.3	11	236	356	425	
12-9	124.0	151174	35	18	1.1	T	0.3	0.1	3.1	9	122.2	6.1	T	75.0	39.8	10	228	351	398	
1960																				
1-14	1340.0	151411	44.5	435	12	0.3	0.3	0.1	8.5	7	76.1	28.1	T	61.1	26.8	13	164	263	336	0.1
2-10	2590.0	151694	36	690	22	0.1	0.2	0.1	6.9	6	81.7	28.1	T	74.1	29.4	4	200	307	366	0.1
3-23	190.0	151898	32.5	16	1.1	0.1	0.3	0.1	5.9	10	107.4	17.9	T	77.3	33.6	11	216	332	419	0.2

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1960																				
4-21	690.0	152096	59.5	129	3.3	0.1	0.3	0.1	6.4	7	95.0	30.4	0.0	79.7	36.0	3	220	348	391	0.1
5-12	154.0	152223	47.5	9	0.7	T	0.2	0.1	4.8	11	114.0	19.0	0.1	83.2	39.0	0	220	369	409	0.1
6-16	1520.0	152491	63.5	275	7.1	0.1	0.2	0.1	11.4	6	64.8	47.8	0.1	64.5	27.4	5	170	274	347	0.2
7-13	212.0	152781	81	41	2.0	T	0.4	0.1	5.6	6	97.5	21.1	T	78.0	35.0	9	232	339	419	0.2
8-11	38.0	152939	76	55	2.2	0.1	0.3	0.1	9.0	9	106.9	11.3	T	71.8	33.9	12	212	319	385	0.2
9-13	3.9	153222	69.5	20	0.9	0.1	0.2	0.2	3.8	11	170.7	1.2	0.1	70.7	49.4	21	232	380	464	0.0
10-11	5.8	153417	60	50	2.1	0.1	0.2	0.2	4.5	14	135.2	2.1	0.1	70.8	37.5	21	216	331	434	0.2
11-16	8.0	153646	50	16	1.0	T	0.2	0.2	2.9	12	179.8	2.6	T	86.0	46.9	19	244	408	512	0.1
12-9	12.0	153827	32	7	0.3	0.0	0.2	0.2	2.8	15	161.5	2.5	T	82.8	44.7	23	252	391	489	0.0
1961																				
1-16	12.0	154054	33	8	0.2	0.1	0.2	0.2	2.5	29	209.4	1.1	T	91.6	66.2	40	328	501	700	0.1
2-14	23.0	154190	38	0	0.3	0.1	0.2	0.2	1.8	24	214.8	5.5	T	137.0	48.3	32	348	541	696	0.4
3-20	142.0	154446	39.5	11	0.7	0.1	0.2	0.1	7.0	10	114.4	21.7	T	78.9	36.8	6	212	349	401	0.3
4-18	86.0	154707	44.5	38	0.9	0.1	0.2	0.1	5.7	18	128.2	8.9	T	71.4	38.1	18	208	335	413	0.2
5-25	134.0	154944	66	28	1.0	0.0	0.3	0.1	3.6	7	116.6	25.9	0.1	80.6	38.5	7	224	360	411	0.2
7-12	21.0	155288	75	41	1.3	T	0.3	0.3	6.0	9	129.6	6.4	T	72.4	42.3	9	222	355	411	0.2
8-29	8.4*	155548	78	13	0.6	0.1	0.3	0.1	3.8	19	120.1	2.0	0.3	59.4	41.2	20	208	318	393	0.1
9-27	1960.0	155726		95	6.4	0.1	0.2	0.1	12.5	4	56.4	14.9	0.1	53.8	23.0	7	168	229	281	0.3

*USGS average daily discharge

WABASH RIVER AT RIVERTON, INDIANA

The Wabash is an intersectional stream, rising in Indiana and flowing southward along more than one-third of the eastern border of Illinois. The gage at Riverton is located downstream of the Illinois Central Railroad bridge, and the gage elevation is 414.65 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 13,100 square miles.

Water quality data from samples collected at Hutsonville, Illinois, were analyzed by the Central Illinois Public Service Company for the periods from March 9, 1955, to June 29, 1960, and from January 8, 1962, to December 6, 1966; tabulations were made for the period from July 29, 1960, through December 1, 1961. Discharge and quality data are also summarized graphically.

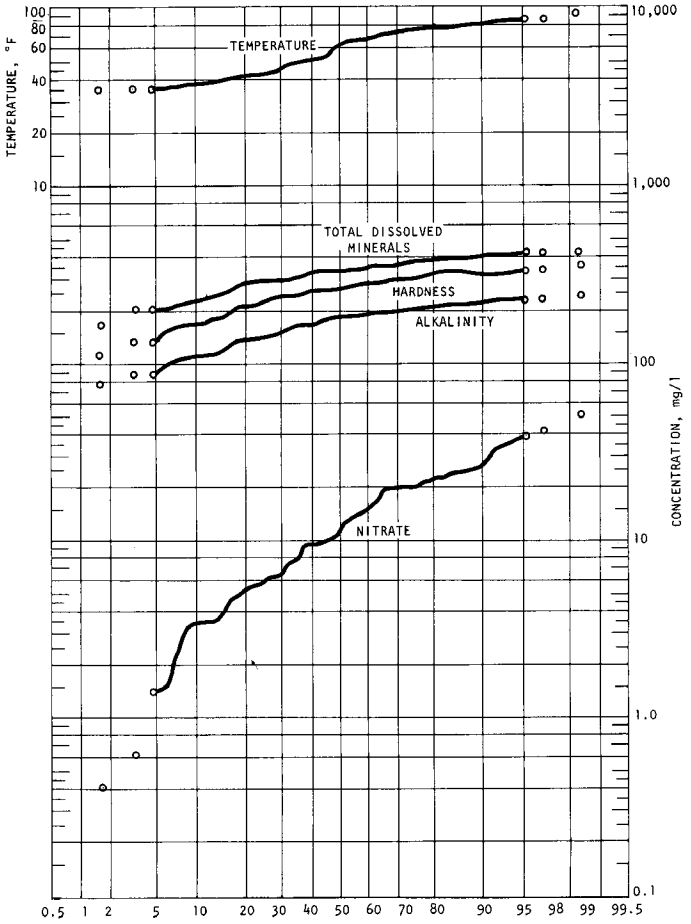
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow did not exceed 2.3 cfs/sq mi and was not less than 0.17 cfs/sq mi, with a median flow of 0.57 cfs/sq mi, during the first period (1955-1960). Instantaneous flow values for the second period were not analyzed.

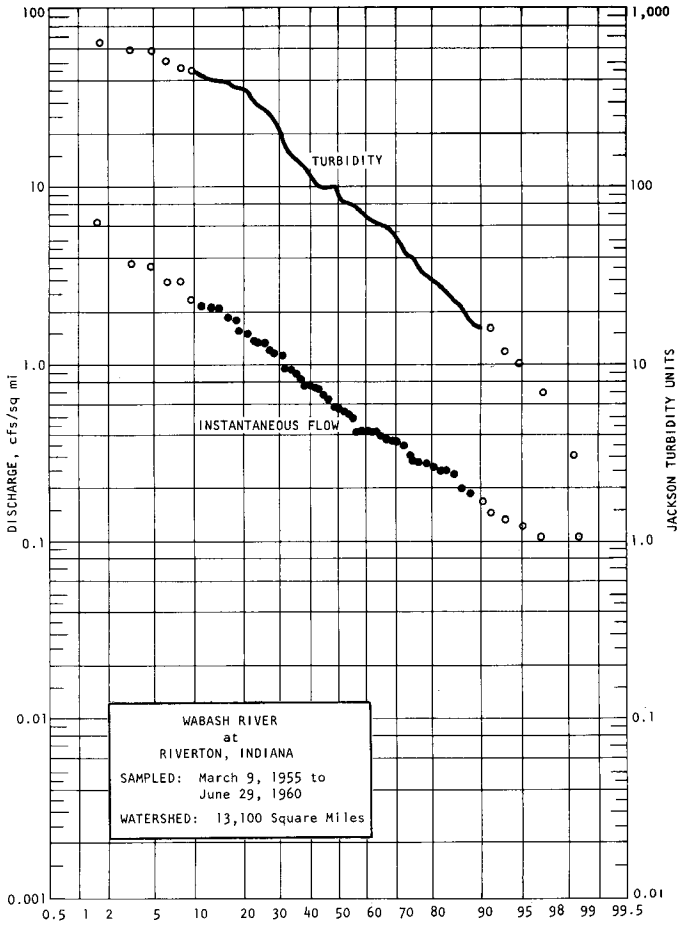
The turbidity was not less than 15 Jtu (1955-1960 and 1962-1966) nor more than 460 Jtu (1955-1960) or 500 Jtu (1962-1966) for the central 80 percent of the time. Median values were 90 Jtu (1955-1960) and 85 Jtu (1962-1966).

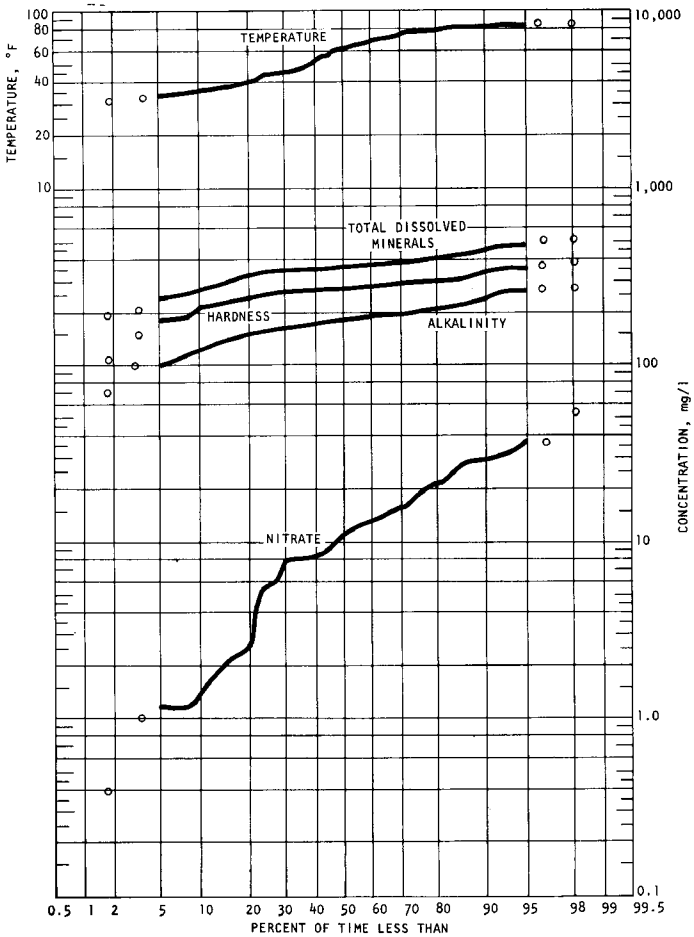
Reported temperatures were over 80 F for 15 (1955-1960) and 19 (1962-1966) percent of the time, and over 70 F for 37 (1955-1960) and 36 (1962-1966) percent of the time. They were below 50 F for 35 (1955-1960) and 38 (1962-1966) percent of the time, and below 40 F for 15 (1955-1960) and 19 (1962-1966) percent of the time.

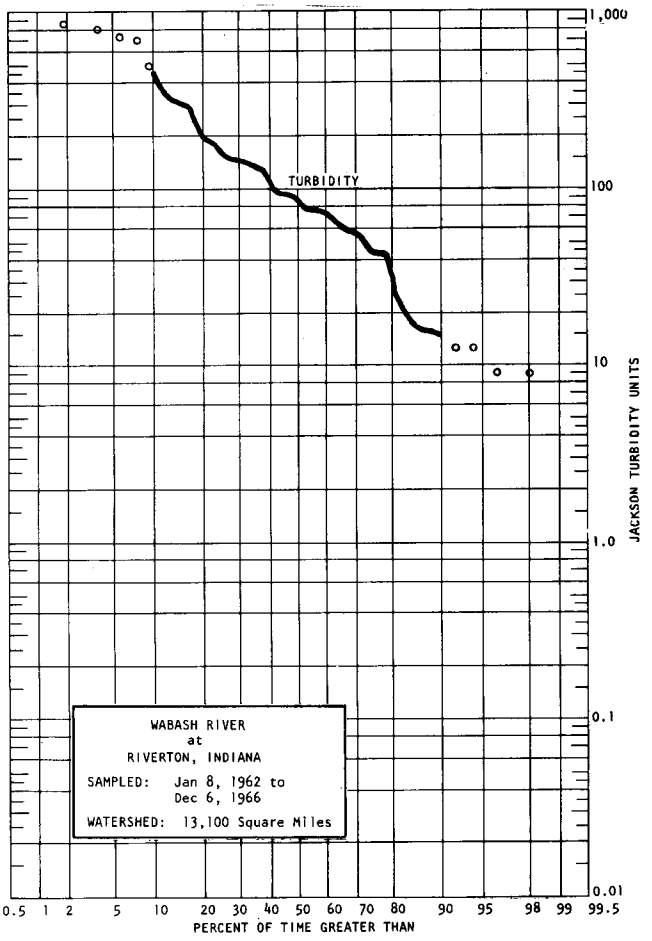
The analyses indicated the following:

		Concentration (*mg/l*) not exceeded for indicated percent of time		
		10%	50%	90%
Alkalinity (as $CaCO_3$)	(1955-1960)	110	180	220
	(1962-1966)	120	180	240
Hardness (as $CaCO_3$)	(1955-1960)	170	265	330
	(1962-1966)	210	275	335
Total dissolved minerals	(1955-1960)	225	340	405
	(1962-1966)	270	360	445
Nitrate	(1955-1960)	3.5	11.5	26
	(1962-1966)	1.4	10.8	29.7
Manganese	(1955-1960)	0	0	0
	(1962-1966)	0	0	0


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE


DISCHARGE, cfs/sq mi
JACKSON TURBIDITY UNITS
TURBIDITY
INSTANTANEOUS FLOW
WABASH RIVER
at
RIVERTON, INDIANA
SAMPLED: March 9, 1955 to June 29, 1960
WATERSHED: 13,100 Square Miles


TEMPERATURE, °F
CONCENTRATION, mg/l
TEMPERATURE
TOTAL DISSOLVED MINERALS
HARDNESS
ALKALINITY
NITRATE
PERCENT OF TIME LESS THAN


JACKSON TURBIDITY UNITS
TURBIDITY
WABASH RIVER
at
RIVERTON, INDIANA
SAMPLED: Jan 8, 1962 to Dec 6, 1966
WATERSHED: 13,100 Square Miles
PERCENT OF TIME GREATER THAN

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness ($CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1955																				
3-9		D-716	44	434	0.4	0.0			28.6	28	54.3	9.4	0.4	45.6	12.9	16	108	167	251	
4-4		No river sample																		
5-4		D-758	69	99	0.2	0.0			11.2	24	76.6	22.4	0.3	77.4	21.2	17	194	280	370	
6-13		D-773	63	511	0.0	0.0			15.0	15	60.6	20.0	0.6	59.4	20.6	2	144	233	292	
7-8		D-791	86	113	0.2	0.0			16.2	20	86.7	13.3	0.3	63.8	24.8	15	173	261	356	
8-5		D-806	93	42	0.1	0.0			8.6	19	67.1	3.5	0.2	50.2	21.1	7	140	212	290	
9-7		D-822	83	40	0.1	0.0			5.6	25	73.9	1.4	0.2	64.2	23.7	16	186	257	320	
10-10		D-836	65	461	0.1	0.0			8.2	15	52.7	13.0	0.3	43.9	12.8	13	110	162	216	
12-13		D-878	38	28	0.2	0.0			10.4	24	86.1	5.1	0.4	89.0	23.2	7	214	317	371	
1956																				
1-9	3200.0	D-903	40	7	0	0.0			11.6	16	12.4	10.0	0.6	92.7	27.9	19	246	346	425	0.0
2-7	5480.0	D-943	40	53	0.1	0.0			15.2	26	78.0	12.9	0.8	67.1	20.6	12	159	252	304	0.0
4-5	15800.0	D-970	58	469	0	0.0			9.8	19	70.5	19.3	0.5	60.0	16.7	13	138	218	290	0.0
5-9	11600.0	D-992	58	199	0.1	0.0			9.6	20	77.9	36.3	0.4	68.7	20.7	19	163	256	337	0.0
6-11	8730.0	D-1012	79	599	0.1	0.0			11.0	23	72.9	14.0	0.3	82.0	23.0	14	202	299	354	0.0
7-5	6380.0	D-1031	82	217	0	0.0			12.8	19	65.5	19.7	0.1	72.9	20.0	10	182	264	339	0.0
8-2	4880.0	D-1064	81	280	0.1	0.0			9.2	22	69.4	7.9	0.2	67.9	17.4	15	170	241	308	0.0
9-10	1890.0	D-1093	73	73	0.1	0.0			7.4	26	85.2	6.8	0.5	60.3	23.6	20	167	247	304	0.0
10-4	1340.0	D-1118	70	30	0.1	0.0			10.0	31	96.0	23.6	0.4	70.8	27.4	30	198	289	388	0.0
11-13	1340.0	D-1127	50	21	0	0.0			9.6	34	92.3	3.7	0.1	82.8	28.1	18	221	322	397	0.0
12-5	1600.0	D-1142	50	26	0	0.0			12.4	29	97.0	5.3	0.8	86.4	26.8	19	232	326	394	0.0
1957																				
1-7	2420.0	D-1166	41	12	0.1	0.0			12.8	29	99.3	21.2	0.8	90.0	27.8	15	220	339	427	0.0
2-7	4880.0	D-1182	43	34	0.1	0.0			9.6	29	00.0	19.7	0.5	80.8	26.4	9	182	310	385	0.0
3-7	10600.0	D-1204	44	242	0.1	0.0			13.0	19	86.1	19.7	0.3	64.3	19.2	0	112	239	279	0.0
4-10	46200.0	D-1225	45	269	0	0.0			10.0	14	52.9	42.4	0.3	44.5	12.6	14	89	162	221	0.0
5-7	18200.0	D-1242	61	120	0	0.0			12.4	19	70.7	19.7	0.3	67.5	20.3	12	163	252	341	0.0
7-2	81300.0	D-1286	76	300	0	0.0			14.0	9	24.7	14.4	0.8	32.6	7.3	4	77	111	166	0.0
8-6	9560.0	D-1315	77	399	0	0.0			11.8	18	55.8	9.5	0.1	56.0	17.5	9	148	211	290	0.0
9-5	3480.0	D-1331	76	68	1.2	0.0			8.6	26	80.9	3.5	0.4	72.6	24.9	13	194	283	353	0.0
10-4	3620.0	D-1347	65	45	0	0.0			12.0	23	75.7	4.6	0.3	71.5	21.6	18	195	267	335	0.0
11-6	5030.0	D-1359	55	64	0.1	0.0			11.6	24	75.6	3.6	0.4	75.8	23.6	9	193	286	345	0.0
12-3	5480.0	D-1378	43	16	0.2	0.0			19.4	23	84.9	21.2	0.1	90.0	26.5	8	222	333	387	0.0
1958																				
1-6	19900.0	D-6	36	77	0.1	0.0			10.4	18.2	76.2	9.8	0.4	77.2	22.1	3.5	183	280	338	0.0
2-5	7600.0	D-21	40	17	0.2	0			13.2	20.7	90.8	21.2	0.6	99.2	26.1	2.7	226	352	392	0.0
3-3	15300.0	D-41	38	352	0.2	0			11.4	13.3	75.5	6.1	0.8	59.6	16.8	5.2	136	212	284	0.0
4-7	8240.0	D-64	54	59	0.1	0			10.8	17.0	17.0	11.2	0.1	75.2	25.9	12.2	200	304	331	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness (as $CaCO_3$)	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1958																				
5-1	6680.0	D-74	58		0.1	0.0			6.4	23.1	23.1	5.5	0.3	76.8	25.6	8.1	200	292	341	0.0
5-29	5180.0	D-101	74	143	0.1	0.0			6.4	20.7	20.7	9.4	0	66.4	23.4	13.0	174	260	346	0.0
7-2	27700.0	D-128	77	135	0.1	0.0			13.4	17.6	67.3	17.0	0.2	69.2	17.6	19.3	185	254	320	0.0
8-1	30800.0	D-180	75	366	0.0	0.0			8.6	20.7	40.1	5.7	0.1	38.4	7.8	18.1	100	132	202	0.0
9-4	7290.0	D-196	76	100	0.3	0.0			18.0	21.3	92.3	7.1	0.2	78.4	23.6	21.6	215	300	369	0.0
10-1	5330.0	D-217	69	60	0.2	0.0			22.8	20.7	84.2	14.4	0.1	79.8	23.7	20.2	218	292	360	0.0
10-28	3340.0	D-246	55	22	0.1	0.0			23.0	24.9	84.7	7.6	0.2	84.9	27.2	15.7	237	324	411	0.0
12-1	19800.0	D-266	36	132	0.2	0.0			25.0	17.6	98.0	51.0	0.3	66.5	19.2	33.7	156	248	380	0.0
1959																				
1-2	5330.0	D-292	41	15.6	0.1	0.0			15.4	26.8	88.1	6.1	0.6	88.8	26.6	15.1	236	324	394	0.0
2-13	49000.0	D-306	35	97	0.1	0.0			10.8	16.4	54.8	10.5	0.2	36.8	9.2	14.8	89	132	205	0.0
3-3	24000.0	D-324	43	76	0.1	0.0			8.6	17.0	55.6	22.7	0.1	61.0	16.7	10.4	150	228	273	0.0
4-6	27500.0	D-349	53	400	0.1	0.0			12.4	15.2	51.1	9.8	0.3	54.4	15.6	6.0	135	200	264	0.0
4-29	23600.0	D-365	61	656	0.0	0.0			21.0	14.1	61.2	24.2	0.2	58.7	17.6	14.2	155	224	290	0.0
6-3	10000.0	D-381	74	359	0.0	0.0			21.8	19.5	56.6	20.0	0.1	66.1	20.1	14.9	180	252	344	0.0
7-1	12400.0	D-471	83	590	0.0	0.0			6.4	33.4	39.2	24.6	0.2	45.4	10.0	21.7	112	160	234	0.0
8-1	3620.0	D-498	87	69	0.0	0.0			7.8	21.3	82.0	0.4	0.3	66.1	20.1	17.7	179	256	317	0.0
9-1	2190.0	D-522	86	82	0.0	0.0			11.6	26.8	26.8	6.1	0.2	71.6	25.7	17.9	202	288	357	0.0
10-1	3340.0	D-557	72	60	0.1	0.0			12.8	21.9	70.5	4.8	0.4	58.6	20.6	11.9	161	236	307	0.0
11-3	2670.0	D-669	56		0.1	0.0			14.8	26.1	69.4	3.1	0.2	81.5	24.0	4.6	205	304	361	0.0
12-2	4600.0	D-709	46	10	0.1	0.0			19.8	24.9	85.8	39.3	0.6	85.7	25.5	12.9	200	324	435	0.0
1960																				
1-4	12200.0	D-736	38	32.4	0.1	0.0			23.6	26.1	82.6	33.2	0.6	75.8	24.0	14.8	177	292	407	0.0
3-4	7220.0	D-774	37	3.2	0.1	0.0			12.0	22.5	81.8	26.0	0.5	86.1	25.5	8.3	209	316	410	0.0
4-4	38500.0	D-802	52	100.0	0.1	0.0			14.0	23.1	43.2	1.6	0.4	49.4	14.7	0.4	110	180	206	0.0
5-4	9820.0	D-823	64	82.4	01	0.0			7.4	18.8	76.0	15.9	0.2	76.1	22.8	8.2	189	276	345	0.0
6-1	15000.0	D-847	71	415.0	0.0	0.0			16.6	20.0	80.5	20.0	0.2	65.5	19.3	16.0	163	244	369	0.0
6-29	39000.0	D-918	76	152.0	0.0	0.0			8.8	16.4	46.9	0.6	0.1	49.8	13.3	4.8	123	180	233	0.0
7-29		D-938	86		0.1	0.0			6.8	15.2	70.0	12.9	0.4	67.0	18.6	14.2	179	244	320	0.0
8-31		D-1034	85	62.5	0.1	0.0			12.6	28.0	58.5	13.3	0.5	73.0	21.0	10.0	186	268	340	0.0
10-4		D-1051	72	61.5	0.2	0.0			7.4	23.1	74.1	3.6	0.2	64.3	23.8	15.6	183	256	334	0.0
11-1		D-1087	60	68.0	0.1	0.0			4.6	29.7	84.9	3.2	0.4	72.2	25.3	20.0	202	276	370	0.0
12-1		D-2	51		0.0	0.0			8.0	30.4	82.4	14.2	0.4	84.2	26.3	14.2	219	316	396	0.0
1961																				
1-4		D-16	39	18.0	0.1	0.0			13.4	31.6	92.8	9.1	0.1	97.2	27.9	15.6	249	352	460	0.0
2-1		D-57	42	39.5	0.1	0.0			10.4	31.6	116.2	13.3	0.2	96.8	30.8	31.6	268	372	492	0.0
3-3		D-78	46	186.5	0.1	0.0			6.2	24.3	86.5	24.2	0.1	74.4	22.6	19.9	190	282	366	0.0
4-11		D-101	48	55.5	0.1	0.0			7.6	24.3	99.3	25.7	0.4	83.4	22.5	20.4	198	304	407	0.0

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1961																				
5-4		D-132	58	80.4	0.1	0.0			9.2	16.4	52.5	27.8	0.2	51.2	13.7	14.6	122	182	278	0.0
6-2		D-151	72		0.0	0.6			6.4	24.3	84.9	1.0	0.2	69.6	23.4	16.1	188	276	360	0.0
7-7		D-194	80	115.0	0.1	0.0			5.8	22.5	79.7	6.3	0.1	56.5	24.3	13.6	158	248	311	0.0
8-2		D-226	84	188.5	0.2	0.0			8.0	19.5	59.3	27.7	0.1	62.8	18.3	13.5	155	228	304	0.0
10-6		D-351	65	62.0	0.2	0.0			8.0	21.6	72.1	10.9	0.2	72.4	21.7	13.5	195	272	340	0.0
11-1		D-379	60	106.0	0.1	0.0			9.0	29.3	74.1	17.9	0.1	71.2	22.5	18.3	186	266	347	0.0
12-1		D-401	44	60.0	0.1	0.0			7.2	24.4	76.6	24.8	0.5	78.7	22.2	11.7	188	286	364	0.0
1962																				
1-8	18800.0	D-15	35	500	0.0	0.0			4.8	20	82.4	9.2	0.1	62.8	19.7	13	153	238	340	
2-8	24300.0	D-49	35	142	0.0	0.0			8.2	19	50.5	11.8	0.6	51.5	14.5	7	121	188	244	
3-1	31600.0	D-85	33	21	0.0	0.0			10.6	163	76.2	1.0	0.3	84.2	23.6	10	240	307	360	
4-5	17500.0	D-111	52	83	0.2	0.0			18.6	22	65.3	15.7	0.3	73.0	21.7	6	183	272	354	
5-1	15900.0	D-139	66	137	0.0	0.0			9.6	21	35.2	1.2	0.2	39.0	13.9	1	98	155	190	
6-1	7550.0	D-175	82	222	0.1	0.0			14.4	21	73.5	31.5	0.1	71.5	23.4	22	200	275	375	
7-3	4680.0	D-217	83	149	0.1	0.0			4.6	26	78.4	7.2	0.2	57.6	23.4	14	150	240	298	
8-1	8640.0	D-251	76	150	0.1	0.0			9.4	18	60.8	8.4	0.2	69.2	20.1	11	188	256	339	
9-4	3730.0	D-285	80	182	0.2	0.0			10.2	29	67.3	5.5	0.2	63.0	23.6	15	175	254	339	
10-4	2620.0	D-311	70	100	0.2	0.0			4.8	28	77.7	2.5	0.8	64.6	25.4	16	190	266	246	
12-5	2390.0	D-399	48	17	0.1	0.0			6.8	29	85.4	15.7	0.2	91.4	28.5	14	240	346	421	
1963																				
1-4	2070.0	D-21	46	9	0.1	0.0			9.4	30	94.3	21.5	0.2	92.6	29.4	26	260	352	464	
2-1	1690.0	D-71	39	16	0.1	0.0			10.0	38	105.6	18.7	0.1	104.4	31.9	32	262	392	504	
3-7	38000.0	D-106	34	801	0.2	0.0			25.6	18	33.3	26.0	0.9	30.8	7.0	7	70	106	205	
3-28		No river sample																		
4-3	24600.0	D-162	62	319	0.1	0.0			10.4	30	56.8	21.2	0.1	61.7	17.9	13	148	228	298	
6-3	4960.0	D-192	79	700	0.1	0.0			6.8	46	97.0	15.4	0.1	62.8	24.6	36	168	258	371	
6-28	2740.0	D-234	84	78	0.0	0.0			8.4	26	82.6	2.6	0.3	50.7	22.7	20	142	220	305	
8-1	4260.0	D-273	84	77	0.0	0.0			7.8	24	73.5	8.4	0.1	67.8	19.9	21	187	251	350	
9-9	1780.0	D-312	80	57	0.1	0.0			9.8	32	86.5	8.7	0.4	73.0	25.8	22	197	289	369	
9-30	1510.0	D-329	67	50	0.2	0.0			8.2	30	86.5	2.5	0.4	69.6	26.4	22	208	282	364	
11-1	1430.0	D-368			0.0	0.0			11.4	31	84.4	8.3	0.1	70.0	23.7	35	218	272	395	
12-5	1430.0	D-400	48	13	0.0	0.0			4.2	32	78.0	10.0	0.2	81.3	27.0	17	222	314	404	
1964																				
1-7	1130.0	D-10	49	15	0.0	0.0			5.4	42	107.3	6.1	0.8	92.5	30.4	36	270	356	482	
2-1	3470.0	D-33	38		0.1	0.0			7.4	28	79.1	24.2	0.3	63.8	18.7	28	161	236	330	
3-2	2060.0	D-72	47	18	0.1	0.0			5.0	33	97.8	10.0	0.4	76.3	27.3	28	212	303	399	
4-2	11900.0	D-107	46	131	0.1	0.0			10.0	27	100.9	36.3	0.1	73.0	20.8	18	143	268	383	
5-1	59600.0	D-140			0.0	0.0			12.0	17	58.3	7.7	0.2	50.6	12.7	10	111	179	252	

Date	Instantaneous discharge cfs	Laboratory number	Temperature °F	Turbidity Jtu	Iron Fe	Manganese Mn	Fluoride F	Boron B	Silica SiO_2	Chloride Cl	Sulfate SO_4	Nitrate NO_3	Ammonium NH_4	Calcium Ca	Magnesium Mg	Sodium Na	Alkalinity (bicarbonate) (as $CaCO_3$)	Total hardness	Total dissolved minerals TDM	Phosphate (filtered) PO_4
1964																				
6-12	4120.0	D-169	82		0.1	0.0			7.0	26	82.6	5.1	0.1	64.9	23.9	4	157	260	340	0.0
7-1	5660.0	D-209	85	131	0.1	0.0			6.0	22	69.2	16.6	0.1	73.2	22.1	8	181	274	357	0.0
8-11	2170.0	D-260	82	61	0.1	0.0			7.0	21	84.7	1.2	0.9	65.3	25.6	12	184	268	348	0.0
9-1	1730.0	D-277	78	74	0.1	0.0			6.8	27	84.4	8.3	0.2	64.1	24.4	20	181	261	351	0.0
10-1	1630.0	D-313	70	75	0.1	0.0			6.8	34	85.1	1.2	0.5	65.2	24.0	25	185	262	365	0.0
11-5	1430.0	D-351	61	45	0.1	0.0			3.6	37	89.2	2.0	0.8	68.8	25.6	31	208	277	383	0.0
12-4	1840.0	D-385	46	14	0.1	0.0			6.0	39	97.0	0.4	0.9	69.6	23.5	31	193	271	382	0.0
1965																				
1-5	5520.0	D-12			0.1	0.0			5.8	31	97.2	12.2	0.1	67.6	21.4	26	161	257	369	0.0
2-5	3900.0	D-42	37	45	0.1	0.0			8.6	31	104.2	14.4	0.2	78.4	23.4	8	154	292	375	0.0
3-4	17700.0	D-136	40	360	0.1	0.0			12.4	28	86.1	1.5	0.2	67.6	20.2	3	136	252	330	0.0
4-8	27000.0	D-209	56	890	0.1	0.0			17.0	23	48.8	30.3	0.3	49.9	13.3	9	100	179	275	0.0
5-6	16300.0	D-251	68	159	0.1	0.0			8.2	25	89.8	21.2	0.1	75.0	20.4	18	168	271	350	0.0
6-3	12900.0	D-395	72	219	0.1	0.0			6.2	26	87.3	29.5	0.2	78.4	22.4	9	163	288	387	0.0
7-1	4820.0	D-448	84	35.5	0.1	0.0			5.4	28	90.0	13.5	0.3	58.6	26.2	22	164	254	345	0.0
8-4	2500.0	D-464	80	143	0.2	0.0			4.0	27	83.2	6.1	0.4	64.4	25.4	16	177	265	360	0.0
9-2	2060.0	D-550	78	71	0.0	0.0			4.8	30	84.6	8.2	0.3	58.8	24.2	0	115	246	262	0.0
10-8	3470.0	D-584	64	95	0.1	0.0			3.6	29	84.7	13.3	0.2	73.6	24.3	16	182	284	362	0.0
11-3	2980.0	D-618			0.0	0.0			12.0	33	88.3	11.5	0.5	76.4	25.2	26	208	295	398	0.0
12-3	3220.0	D-669	43	44	0.1	0.0			7.0	33	84.9	8.4	0.6	82.8	27.5	18	226	320	464	0.0
1966																				
1-11		D-16	32	93	0.1	0.0			7.0	28	88.7	13.6	0.2	83.2	24.6	6	182	309	381	0.0
2-4		D-68	39	10	0.0	0.0			11.2	23	117.8	11.9	0.8	100.0	27.7	32	272	364	519	0.0
3-8		D-184	42	90	0.1	0.0			10.4	26	94.3	13.6	0.2	79.2	23.4	18	195	294	406	0.0
4-14		D-220	51	76	0.1	0.0			7.4	26	95.5	28.8	0.3	86.8	28.7	12	205	335	439	0.0
5-3		D-263	57	188	0.2	0.0			7.8	17	79.1	36.3	0.3	77.6	24.6	9	184	295	396	0.0
6-3		D-360	73	97	0.1	0.0			3.0	21	91.0	20.0	0.2	68.0	28.7	6	168	288	353	0.0
		D-391	87	50	0.1	0.0			3.8	25	86.9	9.1	0.1	48.8	23.9	22	138	220	321	0.0
9-2		D-446	85	28	0.1	0.0			10.6	25	100.3	15.1	0.3	68.0	25.8	30	193	276	416	0.0
10-4		D-550	69	59	0.1	0.0			6.4	31	115.7	1.7	0.6	72.4	28.1	20	182	296	409	0.7
11-9		D-593	60	66	0.1	0.0			2.0	33	107.9	2.2	0.8	76.4	25.9	33	212	297	414	0.0
12-6		D-625	36	312	0.2	0.0			13.4	20	80.5	54.4	0.6	61.0	17.1	25	128	223	329	0.4

WOLF CREEK NEAR BEECHER CITY

Wolf Creek rises in the Springfield Plain Region south of Stewardson and flows southwesterly and into the Kaskaskia River. The gaging station is 2.2 miles southwest of Beecher City, and the elevation of the gage datum is 535.48 feet above mean sea level, datum of 1929. The drainage basin above the gage has an area of 48 square miles.

The tabulation of water quality data is for the period from October 19, 1961, to September 21, 1966. Discharge and quality data are also summarized graphically.

No duration curve of average daily flow values is available for comparison with instantaneous flows.

Annual rainfall during the period of sample collection was from 6.8 inches above normal to 12.17 inches below normal, based on records for one station within the drainage basin. The average annual departure was —6.65 inches.

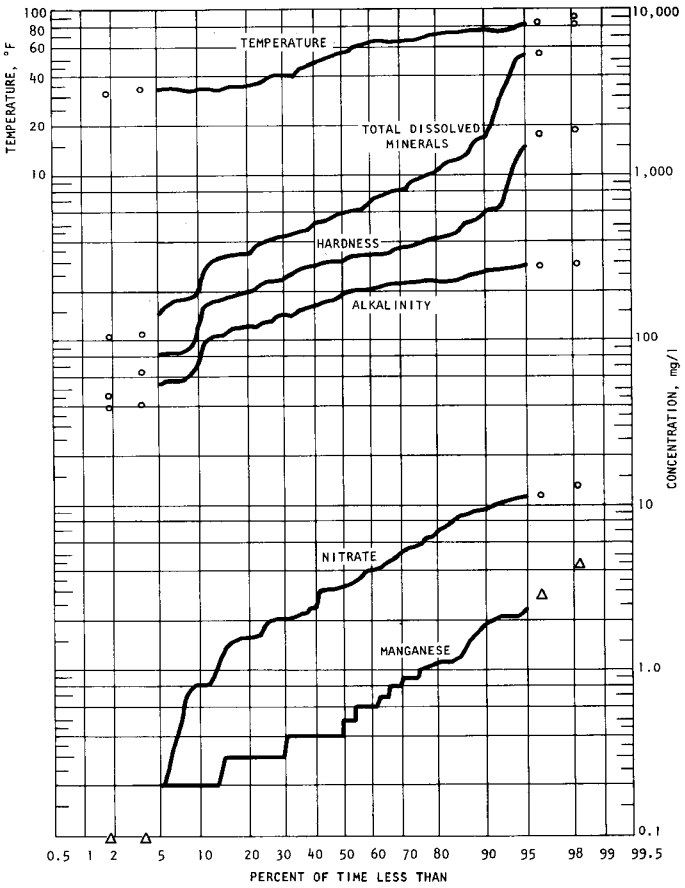
For 80 percent of the time, in the interval between 10 and 90 percent, the instantaneous flow ranged between 0.6 cfs/sq mi and 0 cfs/sq mi, with a median flow of 0.033 cfs/sq mi.

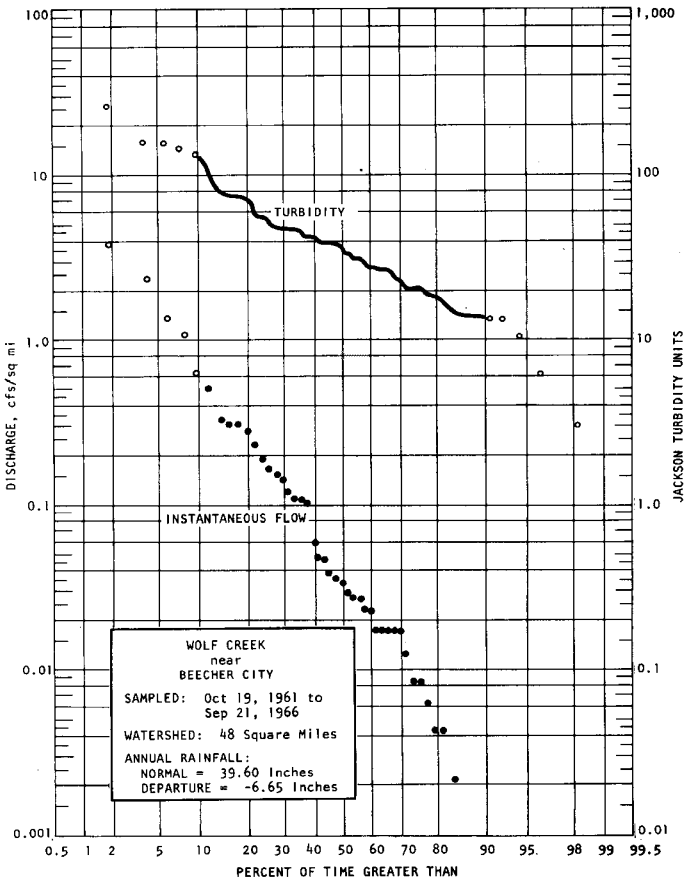
The turbidity was not less than 15 Jtu nor more than 130 Jtu for the central 80 percent of the time, with a median value of 35 Jtu.

Reported temperatures were over 80 F for 5 percent and over 70 F for 25 percent of the time. They were below 50 F for 40 percent and below 40 F for 25 percent of the time.

The analyses indicated the following :

	Concentration (*mg/l*) not exceeded for indicated percent of time		
	10%	50%	90%
Alkalinity (as $CaCO_3$)	80	190	260
Hardness (as $CaCO_3$)	110	310	620
Total dissolved minerals	210	590	1700
Nitrate	0.8	3.3	9.6
Manganese	0.2	0.5	1.8





Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1961																				
10-19	0.4	155900	53	21	0.8	1.4	0.2	0.1	9.2	620	76.1	4.1	T	106.4	33.8	331	148	405	1325	0.3
11-16	5.0	156147	52	21	1.2	0.4	0.2	0.1	10.7	320	70.3	1.6	T	87.8	30.3	177	204	344	838	0.3
12-5	9.1	156331	42	41	0.1	0.4	0.2	0.1	9.9	100	61.3	4.3	0.1	67.0	25.4	67	212	272	472	0.5
1962																				
1-19	25.0*	156496	33	13	0.5	0.2	0.2	0.1	8.4	47	52.7	6.3	T	50.0	18.2	34	148	200	306	0.2
2-5	190.0	156657	34	143	4.4	0.3	0.2	0.0	5.2	9	19.5	9.3	T	16.4	5.8	7	40	65	101	0.4
3-5	14.7	156967	37	3	0.4	0.2	0.2	0.0	10.4	78	61.5	4.6	0.2	64.0	21.4	52	184	248	401	0.1
4-19	5.1	157293	58	27	1.7	0.4	0.2	0.1	6.7	130	70.1	3.1	T	105.0	45.6	10	212	450	537	0.1
5-18	10.7	157457	72	47	2.3	0.3	0.1	0.1	10.3	71	61.7	5.4	0.1	63.7	19.1	60	200	238	418	0.3
6-28	1.7	157915	82	39	0.9	0.4	0.2	0.1	13.4	110	49.0	2.4	T	66.8	21.9	73	208	257	462	0.2
7-10	0.6	158073	75	46	1.7	0.8	0.2	0.1	9.2	152	65.2	1.6	T	80.0	28.7	95	240	318	572	0.2
8-23	0.0	158415	77	58	0.3	2.0	0.1	0.2	1.8	620	67.3	2.3	T	90.9	32.3	349	156	360	1271	0.1
9-19	0.2	158605	65	43	2.1	0.9	0.1	0.1	8.5	124	60.7	2.2	0.1	60.9	20.8	74	160	238	473	0.2
10-17	0.4	158817	57	70	3.3	2.8	0.2	0.1	12.9	1600	66.6	4.0	0.1	152.0	57.2	876	192	615	2932	0.3
11-15	1.6	158006	46	29	1.2	0.4	0.1	0.1	11.5	150	49.4	1.6	0.1	70.1	26.4	85	204	284	535	0.2
12-19	1.3	159201	34	14	0.9	0.5	0.3	0.0	10.2	420	68.9	0.8	0.1	99.2	39.6	232	252	411	1076	0.0
1963																				
1-17	0.8	159365	33	16	0.9	0.1	0.3	0.0	6.8	130	73.0	2.0	T	80.3	32.1	83	252	333	592	0.0
2-14	0.8	159550	32	18	1.2	1.2	0.2	0.0	5.8	570	78.0	3.2	0.1	108.2	41.6	316	240	441	1275	0.2
3-11	23.9	159764	43	36	1.5	0.2	0.1	0.0	9.8	83	55.5	13.5	0.3	50.3	17.3	50	120	197	390	0.6
4-11	5.3	159949	56	14	0.6	0.5	0.2	0.1	7.8	126	64.8	3.5	0.5	76.0	28.2	79	232	306	543	0.1
5-18	30.0	160218	66	71	2.5	0.3	0.2	0.1	10.7	54	41.6	8.6	0.1	44.1	15.7	40	136	175	316	0.3
6-13	2.3	160384	75	161	5.9	.84	0.2	0.1	6.8	74	35.0	6.4	0.1	40.2	13.7	50	120	157	313	0.2
7-26	0.0	160796	77	53	1.9	2.07	0.2	0.2	3.0	315	67.1	2.4	0.1	82.8	32.8	176	208	342	838	0.2
8-15	0.8	160989	69	149	2.2	1.14	0.1	0.1	4.4	345	47.1	3.3	0.1	76.0	30.6	194	200	316	826	0.2
9-18	0.0	161224	68	34	1.4	2.08	0.1	0.4	3.6	4813	77.8	7.9	0.1	330.5	139.0	2589	152	1398	8160	0.5
10-16	0.0	161423	64	27	1.8	.95	0.1	0.1	2.6	2281	912.3	3.6	T	367.3	225.3	1133	140	1845	5068	0.3
11-13	0.0	161626	41	32	2.8	.30	0.1	0.1	3.1	2650	1045.0	0.6	T	433.3	208.6	1407	172	1938	5825	0.1
12-11		No sample taken, no flow																		
1964																				
1-17		No sample taken, no flow																		
2-13	1.3	162239	36	45	3.1	.33	0.3	0.1	9.3	575	94.0	3.1	T	103.0	41.7	289	144	429	1214	0.2
3-13		162417	47	71	2.7	.17	0.3	0.0	8.2	35	36.4	9.7	T	23.8	6.7	30	56	87	190	0.7
4-15	5.9	162678	61	14	0.8	.57	0.2	0.0	9.9	155	76.5	1.5	T	76.1	26.6	92	200	300	605	0.1
5-14	2.2	162871	57	39	2.0	.87	0.2	0.1	6.4	185	62.9	2.0	T	86.5	28.3	109	244	333	611	0.1
6-10	0.1	163130	76	40	1.8	1.50	0.3	0.1	5.6	890	93.4	3.4	T	129.2	48.2	496	244	521	1790	0.1
7-31		No sample taken, no flow																		
8-19		No sample taken, no flow																		

Date	Instantaneous discharge	Laboratory number	Temperature	Turbidity	Iron	Manganese	Fluoride	Boron	Silica	Chloride	Sulfate	Nitrate	Ammonium	Calcium	Magnesium	Sodium	Alkalinity (bicarbonate)	Total hardness	Total dissolved minerals	Phosphate (filtered)
	cfs		°F	Jtu	Fe	Mn	F	B	SiO_2	Cl	SO_4	NO_3	NH_4	Ca	Mg	Na	(as $CaCO_3$)		TDM	PO_4
1964																				
9-12		No sample taken, no flow																		
10-15		No sample taken, no flow																		
11-19	0.0	164680	40	47	3.1	4.36	0.1	0.0	5.5	870	216.8	0.8	T	153.6	65.7	438	152	653	1871	0.2
12-16	0.2	164830	35	32	1.6	.65	0.2	0.3	7.7	405	80.0	4.0	T	77.9	28.6	223	140	312	933	0.4
1965																				
1-14	0.3	164998	33	26	1.5	.38	0.3	0.2	8.5	415	88.5	2.0	0.2	90.0	32.3	227	172	358	978	0.4
2-12		165170	38	130	3.4	.33	0.2	0.2	11.7	68	54.1	11.5	T	42.7	14.0	45	100	164	323	0.6
3-18	7.4	165427	38	15	0.8	.22	0.1	0.0	9.3	64	78.6	5.8	0.0	64.1	23.2	48	184	256	421	0.4
4-16	117.0	165677	50	267	9.4	.51	0.1	0.0	11.6	20	30.6	8.8	0.0	25.1	7.3	20	68	92	187	0.5
5-10	7.9	165933	68	21	1.4	.59	0.1	0.1	5.8	350	73.8	0.2	0.0	92.0	33.0	200	228	365	944	0.1
6-17	1.1	166276	66	23	1.0	.88	0.3	0.1	9.4	150	59.7	1.3	0.0	78.0	27.0	96	240	306	596	0.3
7-23	1.4	166730	83	34	1.4	.55	0.3	0.1	11.4	158	54.1	2.0	0.1	80.6	28.0	97.8	248	316	591	0.0
8-19	1.1	166992	77	77	2.9	1.33	0.2	0.2	6.4	184	71.2	3.4	T	76.2	27.7	134	260	304	652	0.3
9-17	64.6	167204	65	167	5.2	.27	0.2	0.1	6.8	13	13.4	4.9	T	14.8	1.9	14	40	46	103	1.2
10-11	3.1	167374	55	26	1.3	.28	0.0	0.1	8.9	275	44.8	2.1	T	63.0	17.8	163	148	230	716	0.5
11-11	.8	167552	48	24	0.9	1.74	0.1	0.1	11.9	255	60.7	0.0	T	95.6	36.0	126	280	386	767	0.3
12-3	.8	167823	40	19	1.5	.72	0.1	0.1	8.9	295	60.7	0.0	T	89.0	34.6	165	244	364	796	0.5
1966																				
1-10	6.5	168124	33	6	0.4	.35	0.1	0.1	10.6	114	62.9	5.6	T	82.5	29.5	71	256	327	524	0.3
2-14	15.8	168296	37	10	0.8	.27	0.0	0.1	9.4	54	53.3	11.1	0.1	56.2	19.3	35	164	219	344	0.3
3-7	15.0	168502	34	43	2.3	.44	0.1	0.1	14.0	61	60.1	7.1	0.1	63.0	20.4	45	184	241	384	0.3
4-22	53.2	168761	65	86	3.3	.39	0.2	0.0	14.6	30	44.4	10.8	T	45.9	15.9	24	136	180	274	0.4
5-6		168815	66	13	0.8	.43	0.2	0.1	13.6	55	72.2	3.1	0.1	74.0	25.7	45	232	290	437	0.1
6-16	1.8	169120	71	38	1.6	.55	0.1	0.1	10.3	78	49.0	0.9	T	71.0	24.5	52	228	278	440	0.1
7-14	0.0	169285	88	53	2.0	1.29	0.1	0.1	7.5	86	245.4	1.9	T	120.0	51.2	63	268	510	748	0.1
8-3		No sample taken, no flow																		
9-21	13.0	169874	63	48	2.1	.14	0.3	0.1	9.5	16	25.7	5.3	0.1	24.0	5.4	13	56	82	160	0.6

*USGS average daily discharge

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