

INTENSE RAINFALLS IN KENTUCKY



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND
ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER



KENTUCKY



INTENSE RAINFALLS IN KENTUCKY

Prepared By:
Art Clay, P.E., Supervisor
Student Training Program

Division of Water
Bureau of Environmental Protection
Department for Natural Resources
And Environmental Protection

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For many years the National Weather Service and other organizations have maintained a system of precipitation gaging stations throughout the state of Kentucky. Monthly records and annual summaries are made available for public use and provide a reliable means for obtaining rainfall data.

This information, however, does not provide an accurate description of intense rainfall produced by short duration thunderstorms which in many cases result in flash floods. Information of this type is usually difficult to obtain since conventional precipitation gages cannot accommodate more than a few inches of rainfall. In addition, storms which produce intense rainfalls usually affect small areas and, therefore, many times miss those watersheds which are gaged. For these reasons, very little published information exists pertaining to recorded intense rainfalls events. People can often be misled regarding the probability of occurrence of storms which produce rainfall of extremely high intensity.

The purpose of this report is to identify some of the intense storms of record in order to demonstrate that extreme rainfall events can occur and in fact have occurred in Kentucky and that design policies which consider these extreme events are not only justified, but absolutely necessary.

The information contained in this report was extracted from historical records, such as newspaper articles. In cases where reports have been compiled by Federal Agencies, the information has usually been developed from surveys conducted after the occurrence of the event. In many cases, however, it has been possible to develop data which is reliable for use in documenting the occurrence of extreme rainfall events.

This report contains a listing of several extreme rainfall events, which have occurred in Kentucky. In nearly every case the rainfall amounts have been determined from “bucket surveys” conducted after the occurrence. The procedure generally consists of an investigation of the affected area, interviews with local residents, and a search for containers, which might provide some indication as to the total amount of rainfall. Much of the information gathered in these surveys is discarded due to lack of sufficient evidence to support its reliability. However, when it can be substantiated that certain containers (i.e.; barrels, buckets, tubs) were empty prior to a storm and were located such that only direct rainfall could be trapped, this information is taken to be reliable and used in the evaluation of the storms.

For each storm listed in this report there is a map showing the communities affected and a data summary. It would be desirable to determine the exact areal extent of each event, but the short duration of this type storm and the methods involved in obtaining the data preclude such determinations.

This report is intended only to verify that very intense rainfall events have occurred in Kentucky. It is virtually impossible to identify susceptible areas from the information available. However, in the mountainous areas of Eastern Kentucky intense rainfall on steep slopes produces rapid runoff, with very little infiltration, causing flash floods.

It is hoped that interested individuals can be made aware that extreme rainfall events do occur in Kentucky. Engineers and designers must consider these occurrences in any and all work which may be affected by an act of nature.

INTENSE RAINFALLS IN KENTUCKY

IDENTIFICATION NUMBER	LOCATION OF NEAREST COMMUNITY	DATE	RAINFALL AMOUNT AND DURATION
1	Simpson, Ky.	July 4, 5, 1939	18.6" in 3 hrs. 20" in 6 hrs.
2.	Morehead, Ky.	July 4, 5, 1939	14" + in 2 hrs.
3.	Dingus, Ky.	July 29, 30, 1961	14" in 6 hrs.
4.	Manchester, Ky.	June 21, 1956	12" in 3 hrs.
5.	Middlesboro, Ky.	July 24, 1965	11" in 4 hrs.
6.	Middlesboro, Ky.	July 25, 1967	12" in 2 hrs.
7.	Scottsville, Ky.	June 23, 24, 1969	9.68" in 7 hrs.
8.	Lancaster, Ky.	July 8, 1955	7" in 2 hrs.
9.	Sanfordtown, Ky.	July 15, 1962	7" in 30 min.
10.	Paducah, Ky.	June 15, 1977	5.35" in 45 min.

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 1

LOCATION: CITY: Simpson
COUNTY: Breathitt
RIVER BASIN: Kentucky River

DATE: July 4, 5, 1939

RAINFALL: MAXIMUM AMOUNT: 18.6 inches 20 in.
DURATION: 3 hours 6 hrs.

OTHER AFFECTED AREAS: Keck, Meatscaffold, Van Cleve, Taulbee,
Wilhurst

TOTAL AFFECTED AREA: 600

AFFECTED STREAMS: Fozen Creek, Quicksand Creek, Boone Fork,
South Fork of Quicksand Creek

PROPERTY DAMAGE: Several Thousand Dollars

LOSS OF LIFE: 52

REFERENCES: (1) "Jackson Times", Jackson, Ky., June 6, 13, 20, 27, 1939;
(2) "Schrader, Floyd., 1945, Notable Local Floods of 1939-
Part 2; Flood of July 5, 1939 in Eastern Ky., U.S. Geological
Survey, Water Supply Paper 967-B;
(3) U. S. Dept. of Commerce, Probable Maximum and TVA Pre-
Cipitation for Tennessee River Basins; Hydrometeorological
Report No. 45, May, 1969, pp. 14, 15, 33, 35, 50

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 2

LOCATION: CITY: Morehead, Ky.
COUNTY: Rowan
RIVER BASIN: Licking River

DATE: July 4, 5, 1939

RAINFALL: MAXIMUM AMOUNT: 14 inches plus
DURATION: 2 hours

OTHER AFFECTED AREAS: Clearfield, Farmers

TOTAL AFFECTED AREA: 600 SQ. MI.

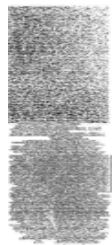
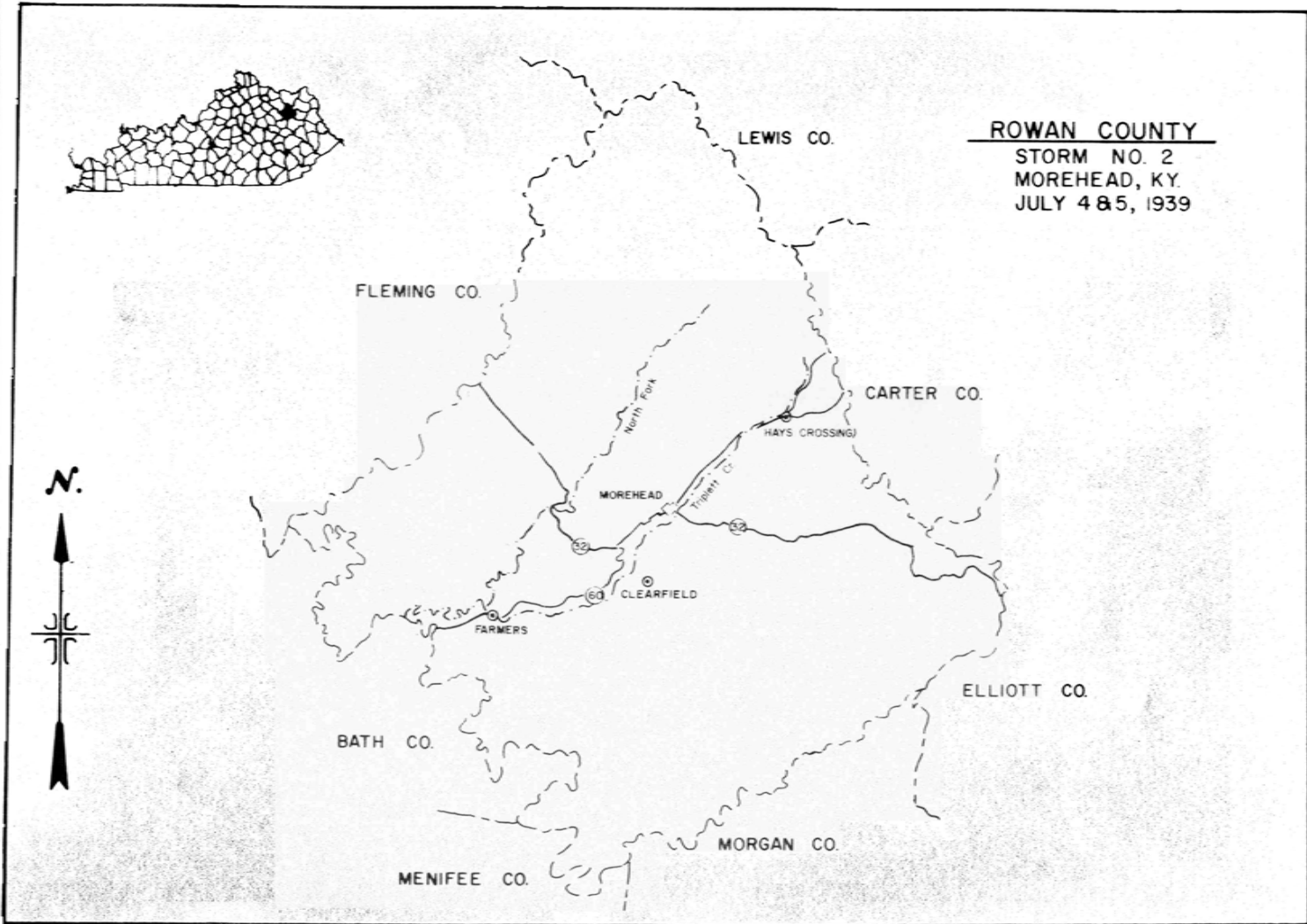
AFFECTED STREAM: Triplett Creek

PROPERTY DAMAGE: \$2,000,000

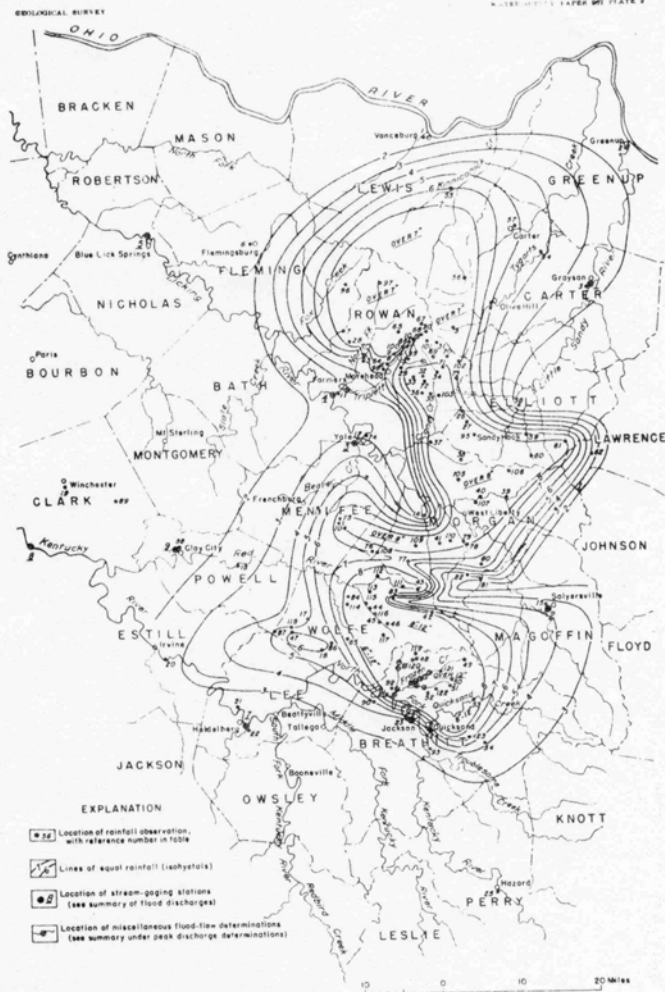
LOSS OF LIFE: 25

REFERENCES: (1) "Morehead Independent", Morehead, Ky.,
June 6, 13, 20, 27, July 3, 1939
(2) Schrader, Floyd F. 1945, Notable Local Floods
In 1939, Part 2; Flood of July 5, 1939 in
Eastern Kentucky, U. S. Geological Survey
Water Supply Paper 967-B

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STORMS 1 & 2



MAP OF EASTERN KENTUCKY SHOWING LOCATION OF OBSERVATIONS OF RAINFALL AND ISOHYETALS FOR TOTAL PRECIPITATION JULY 4-5, 1939, AND LOCATION OF STREAM-GAGING STATIONS AND MISCELLANEOUS MEASUREMENTS OF FLOOD FLOW

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 3

LOCATION: CITY: Dingus, Ky.
COUNTY: Morgan & Magoffin
RIVER BASIN: Licking River

DATE: July 29, 30, 1961

RAINFALL: MAXIMUM AMOUNT: 14 inches
DURATION: 6 hours

OTHER AFFECTED AREAS: Wrigley, Mordica Ridge, West Liberty, and
Salyersville

TOTAL AFFECTED AREAS: Undetermined SQ. MI.

AFFECTED STREAMS: Elk Fork, Straight Creek, Lick Creek, Pricy Creek,
Lacy Creek, Big Mine Fork, Litteral Fork

PROPERTY DAMAGE: \$9,000,000

LOSS OF LIFE: None

REFERENCES: (1) "The Salyersville Independent", Salyersville, Ky
August 4, 1961
(2) "Licking Valley Courier", West Liberty, Ky.,
August 3, 10, 24, 1961
(3) Hannum, C.H. 1963, Floods of July 29, 30,
1961 in Eastern Kentucky, U.S. Geological
Survey Open File Report

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 4

LOCATION: CITY: Manchester, Ky.
COUNTY: Clay and Owsley
RIVER BASIN: Kentucky River River

DATE: June 21, 1956

RAINFALL: MAXIMUM AMOUNT: 12 inches

DURATION: 3 hours

OTHER AFFECTED AREAS: Southern Owsley and Northern Clay County,

TOTAL AFFECTED AREAS: 18 SQ. MI.

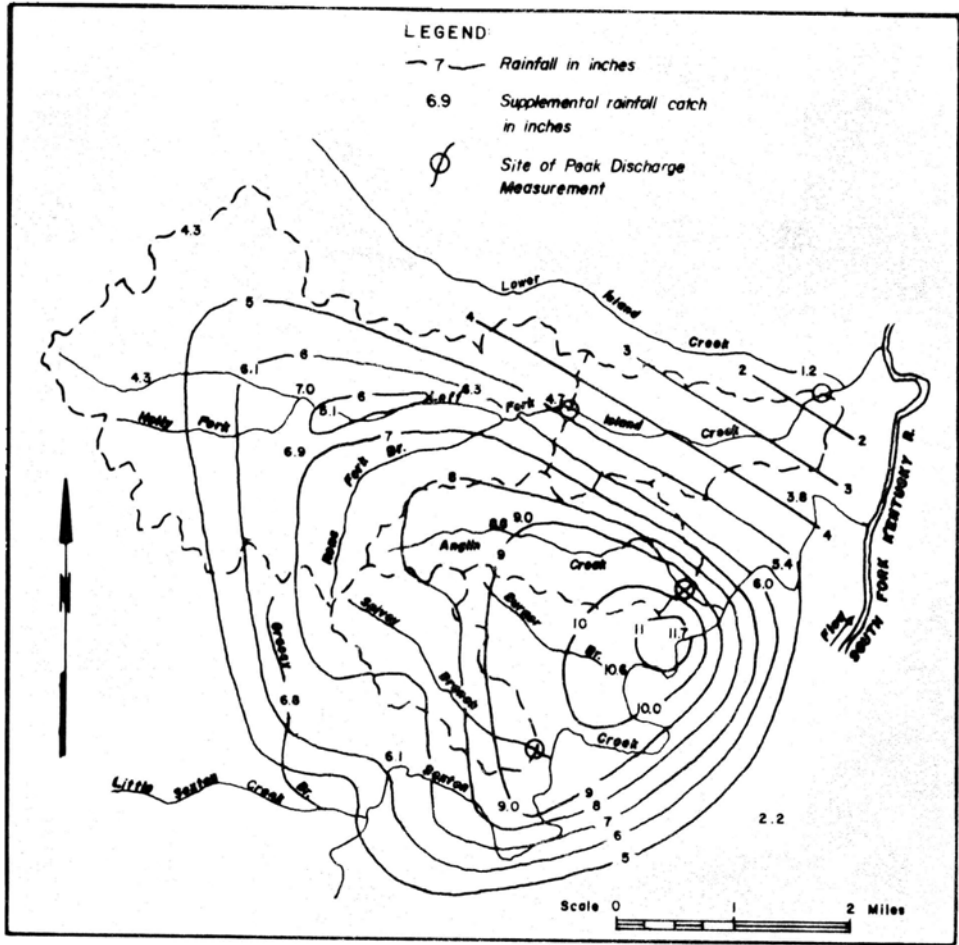
AFFECTED STREAMS: Sextons Creek, Bullskin Creek, Jacks Creek,
Grassy Branch

PROPERTY DAMAGE: \$100,000; 200 homes damaged

LOSS OF LIFE: None

REFERENCES: (1) "Manchester Enterprise", Manchester, KY.,
June 28, 1956
(2) U.S. Dept. of Commerce, Probable Maximum
and TVA Precipitation for Tennessee River
Basins; Hydrometeorological Report No. 45,
May, 1969, pp 6,8.

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STORM NO. 4
MANCHESTER, KY
JUNE 21, 1956



INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 5

LOCATION: CITY: Middlesboro, Ky.
COUNTY: Bell
RIVER BASIN: Cumberland River

DATE: July 24, 1965

RAINFALL: MAXIMUM AMOUNT: 11 inches
DURATION: 4 hours

OTHER AFFECTED AREAS: Ferndale, Premier, Noetown, Higbrite,
Beams Fork, Kettle Island, Fourmile

TOTAL AFFECTED AREAS: Undetermined SQ. MI.

AFFECTED STREAMS: Straight Creek
Yellow Creek

PROPERTY DAMAGE: Several Thousand Dollars

LOSS OF LIFE: None Reported

REFERENCES: (1) "Middlesboro Daily News," Middlesboro,
Kentucky July 24, 26, 27, 28, 1965

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 6

LOCATION: CITY: Middlesboro, Ky.
COUNTY: Bell
RIVER BASIN: Cumberland River

DATE: July 25, 1967

RAINFALL: MAXIMUM AMOUNT: 12 inches

DURATION: 2 Hours

OTHER AFFECTED AREAS: Undertermined

TOTAL AFFECTED AREAS: Undertermined SQ. MI.

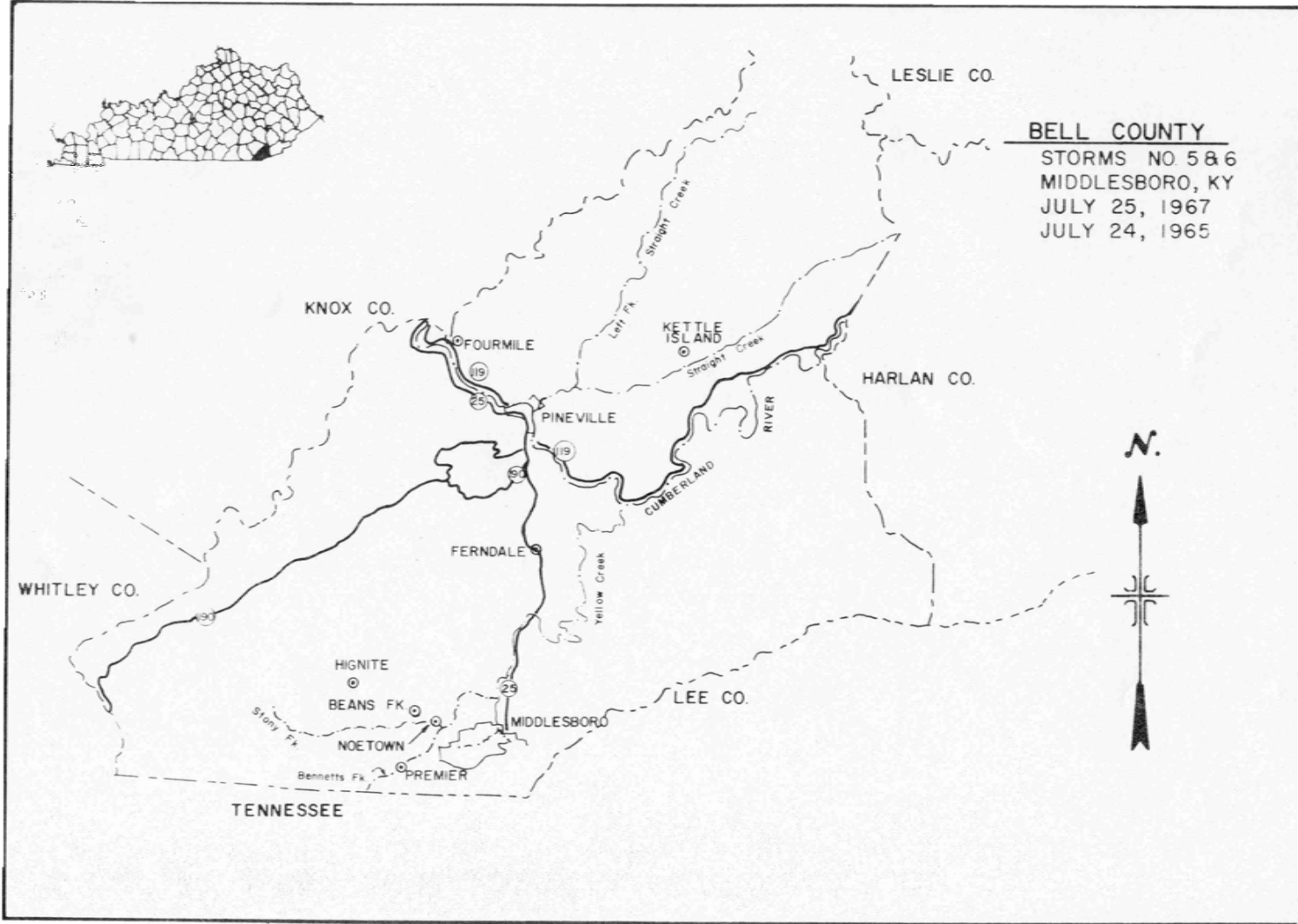
AFFECTED STREAMS: Yellow Creek, Straight Creek

PROPERTY DAMAGE: 1.3 Million

LOSS OF LIFE: One Unconfirmed

REFERENCES: (1) Middlesboro Daily News", Middlesboro,
Ky., July 26, 27, 28, 1967

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NATURAL RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 7

LOCATION: CITY: Scottsville Ky.
COUNTY: Allen
RIVER BASIN: Green River

DATE: June 23, 24, 1969

RAINFALL: MAXIMUM AMOUNT: 9.68 inches
DURATION: 7 hours

OTHER AFFECTED AREAS: Petroleum, Adolphus, Calvert Springs

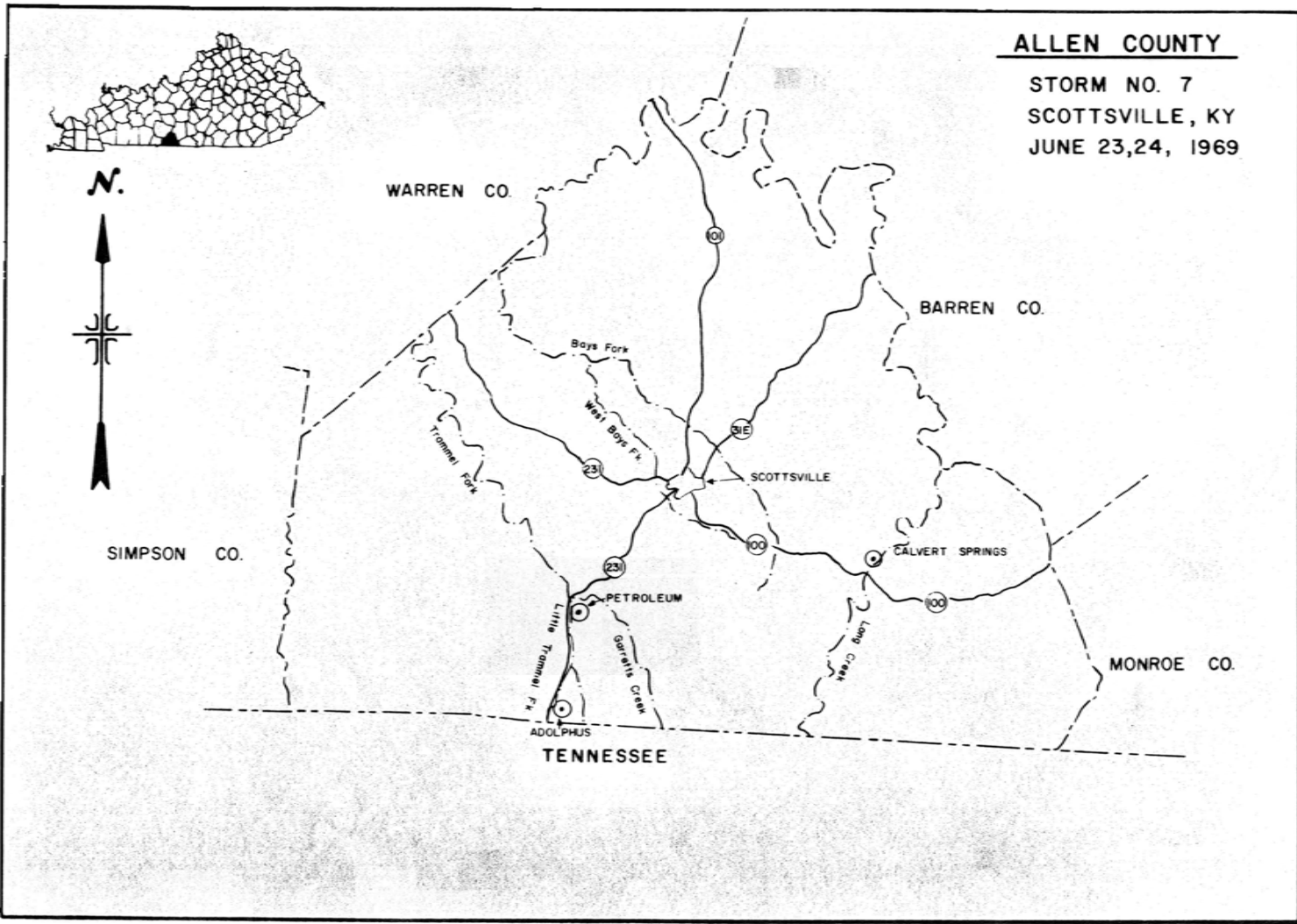
TOTAL AFFECTED AREA: Undetermined SQ. MI.

AFFECTED STREAMS: Trammel Fork, West Bays Fork, Long Creek,
and Garretts Creek

PROPERTY DAMAGE: Public: 3-5 Million; Personal: 25 Million

LOSS OF LIFE: Three

REFERENCES: (1) "The Citizen Times", Scottsville, Ky. June 26,
July 3, 1969
(2) Hannum, C.H., Floods of June 23-24 in
South Central Ky. Summary of Flood in
U. S. in 1969
U.S. Geological Survey Water Supply
Paper 2030



NATURAL RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 8

LOCATION: CITY: Lancaster, Ky.
COUNTY: Garrard
RIVER BASIN: Kentucky River

DATE: July 8, 1955

RAINFALL: MAXIMUM AMOUNT: 7 inches
(see comment below)
DURATION: 2 hours

OTHER AFFECTED AREAS: McCreary, Buckeye

TOTAL AFFECTED AREA: Undetermined SQ. MI.

AFFECTED STREAMS: Sugar Creek, Paint Lick Creek, Scotch Fork,
Back Creek, and Long Branch

PROPERTY DAMAGE: \$1,000,000

LOSS OF LIFE: None

REFERENCES: (1) "The Central Record", Lancaster, Ky.,
July 4, 1955
(2) Sam Vanover, District Conservationist,
Garrard County, USDA Soil Conservation
Service

Comment: Recorded information indicates that the amount was greater than 4 inches. Information obtained from eyewitness accounts indicate that the maximum amount was thought to be about 7 inches.

INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 9

LOCATION: CITY: Sanfordtown, KY
COUNTY: Kenton
RIVER BASIN: Licking River

DATE: July 15, 1962

RAINFALL: MAXIMUM AMOUNT: 7 inches
DURATION: 30 minutes

OTHER AFFECTED AREAS: Undertermined

TOTAL AFFECTED AREAS: Undetermined SQ. MI.

AFFECTED STREAMS: Banklick Creek

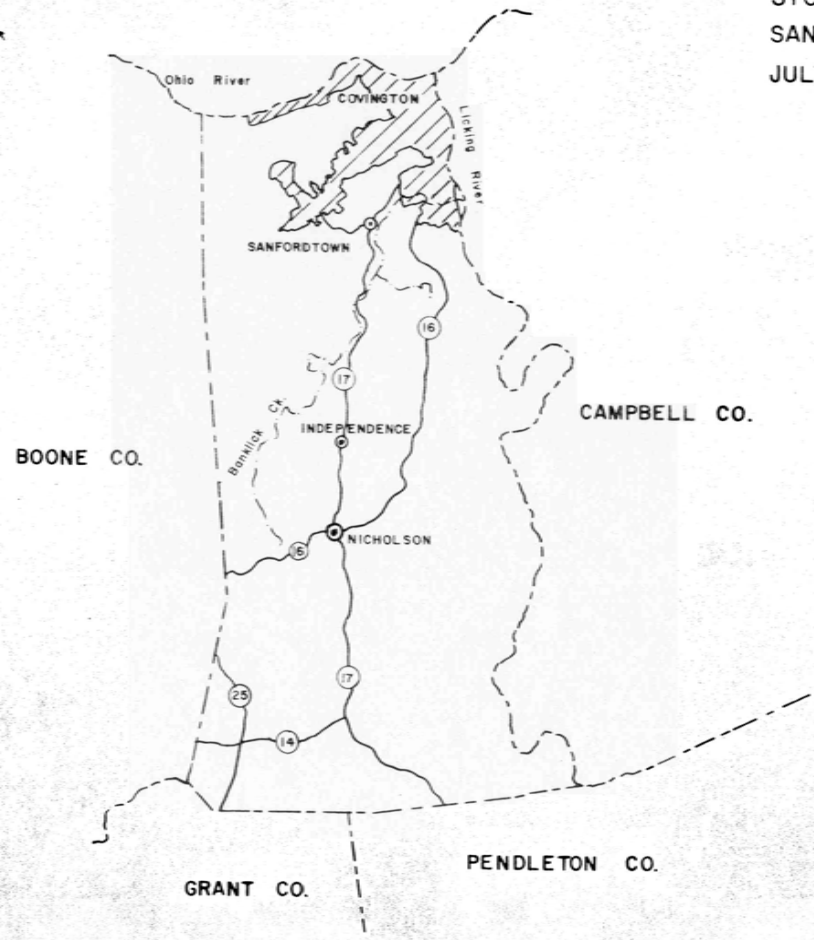
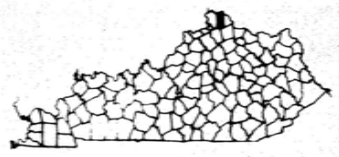
PROPERTY DAMAGE: Over 1 Million Dollars

LOSS OF LIFE: One

REFERENCES: (1) Hannum, C.H., Floods of July 15, 1962
In Banklick Creek Basin; Summary of
Floods in U.S. in 1962; U.S. Geological
Survey, Water Supply Paper 1820

KENTON COUNTY

STORM NO. 9
SANFORDTOWN, KY
JULY 15, 1962



INTENSE RAINFALLS IN KENTUCKY
STORM DATA SUMMARY
IDENTIFICATION NUMBER 10

LOCATIONS: CITY: Paducah
COUNTY: McCracken
RIVER BASIN: Ohio River

DATE: June 15, 1977

RAINFALL: MAXIMUM AMOUNT: 5.35 inches
DURATION: 45 minutes

OTHER AFFECTED AREAS: Undertermined

TOTAL AFFECTED AREA: Undertermined SQ. MI.

AFFECTED STREAMS: Perkins Creek, Island Creek and
Crooked Creek

PROPERTY DAMAGE:

LOSS OF LIFE: None

REFERENCES: (1) "Sun Democrat", Paducah, Ky.,
June 15, 1977

McCRACKEN COUNTY

STORM NO. 10
PADUCAH, KY
JUNE 15, 1977

