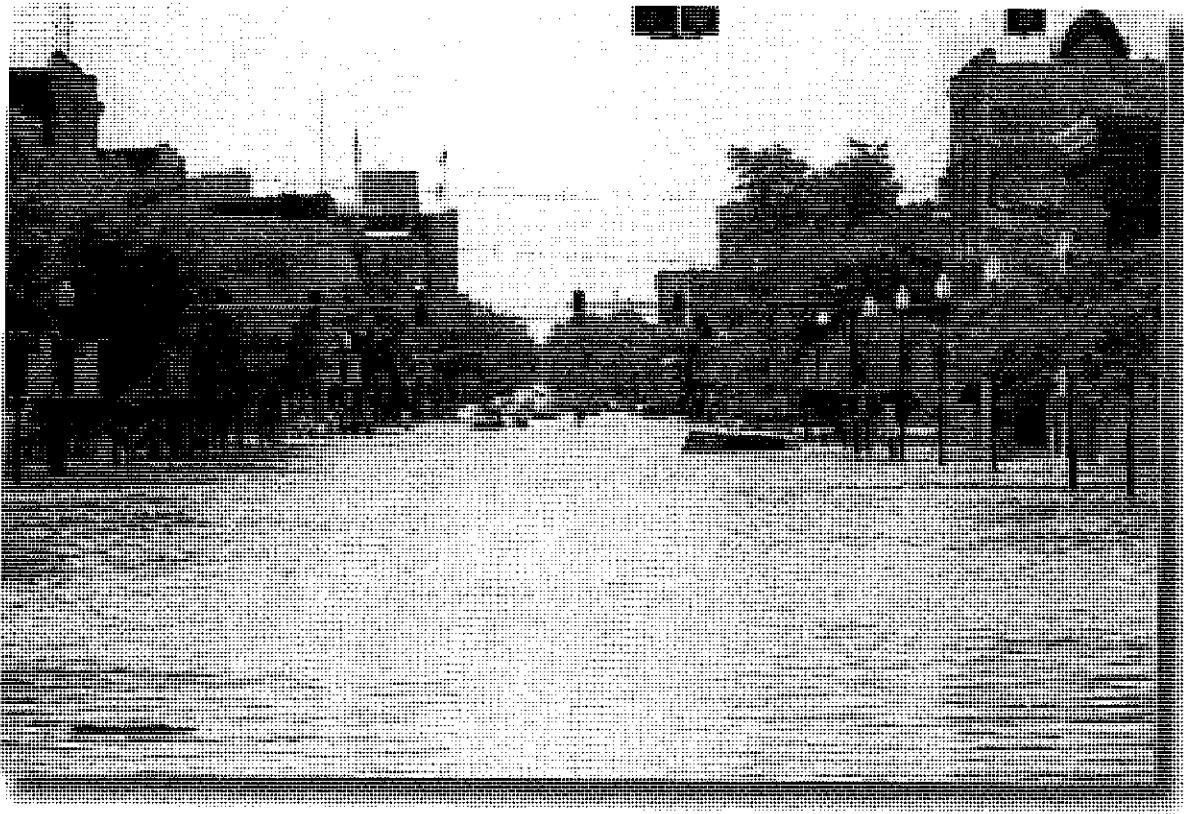


In cooperation with the Federal Emergency Management Agency

Floods of August 21–24, 2007, in Northwestern and North-Central Ohio



Open-File Report 2009–1094

Floods of August 21–24, 2007, in Northwestern and North-Central Ohio

By David E. Straub, Andrew D. Ebner, and Brian M. Astifan

In cooperation with the Federal Emergency Management Agency

Open-File Report 2009–1094

**U.S. Department of the Interior
U.S. Geological Survey**

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

U.S. Geological Survey, Reston, Virginia: 2009

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Conversion Factors, Datums, and Abbreviations

| Multiply | By | To obtain |
|--|---------|--|
| Length | | |
| inch (in.) | 25.4 | millimeter (mm) |
| foot (ft) | 0.3048 | meter (m) |
| mile (mi) | 1.609 | kilometer (km) |
| kilometer (km) | 0.621 | mile (mi) |
| Area | | |
| square mile (mi ²) | 2.590 | square kilometer (km ²) |
| Flow rate | | |
| cubic foot per second (ft ³ /s) | 0.02832 | cubic meter per second (m ³ /s) |
| foot per second (ft/s) | 0.3048 | meter per second (m/s) |
| meter per second (m/s) | 2.237 | mile per hour (mi/h) |
| knot (kts) | 1.15 | mile per hour (mi/h) |

Vertical coordinate information is referenced to North American Vertical Datum of 1988 (NAVD 88), unless otherwise noted.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Elevation, as used in this report, refers to distance above the vertical datum.

Abbreviations

- FEMA – Federal Emergency Management Agency
- GIS – Geographical Information System
- GPS – Global Positioning System
- HEC-RAS – Hydrologic Engineering Center - River Analysis System
- NOAA – National Oceanic and Atmospheric Administration
- NWS – National Weather Service
- Ohio EMA – Ohio Emergency Management Agency
- ODNR – Ohio Department of Natural Resources
- TIN – Triangulated Irregular Network
- USACE – United States Army Corps of Engineers
- USGS – U.S. Geological Survey

Floods of August 21–24, 2007, in Northwestern and North-Central Ohio

By D.E. Straub¹, A.D. Ebner¹, and B.M. Astifan²

Abstract

Heavy rains in northwestern and north-central Ohio on August 19–22, 2007, caused severe flooding and widespread damages to residential, public, and commercial structures in the communities of Bluffton, Bucyrus, Carey, Columbus Grove, Crestline, Findlay, Mansfield, Ottawa, and Shelby. On August 27, 2007, the Federal Emergency Management Agency (FEMA) issued a notice of a Presidential declaration of a major disaster affecting Allen, Crawford, Hancock, Hardin, Putnam, Richland, Seneca, and Wyandot Counties as a result of the severe flooding. Rainfall totals for most of the flooded area were 3 to 5 in., with some locations reporting as much as 8 to 10 in. Three National Weather Service (NWS) gages in the area indicated a rainfall recurrence interval of greater than 1,000 years, and two indicated a recurrence interval between 500 and 1,000 years. Total damages are estimated at approximately \$290 million, with 8,205 residences registering for financial assistance.

The U.S. Geological Survey (USGS) computed flood recurrence intervals for peak streamflows at 22 streamgages and 8 ungaged sites in and around the area of major flooding. The peak streamflows at Sandusky River near Bucyrus streamgage and at seven of the eight ungaged sites had estimated recurrence intervals of greater than 500 years. The USGS located and surveyed 421 high-water marks and plotted high-water profiles for approximately 44.5 miles of streams throughout the nine communities.

Introduction

Heavy rains on August 19–22, 2007, caused severe flooding in northwestern and north-central Ohio. The flooding was the result of rain generated from the remnants of Tropical Storm Erin, combined with an east-west-oriented stationary front that stalled over northern Ohio. Waves of slow-moving thunderstorms continued across the area for 5 days, causing rivers to flood several communities in the area. The flooding was concentrated in the headwaters of three watersheds: the Maumee River, the Sandusky River, and the Muskingum River (fig. 1). Flood

damages to residential, commercial, and public buildings were particularly severe in nine communities within these watershed areas. The cities of Findlay and Ottawa were severely damaged by floodwaters from the Blanchard River. The village of Bluffton was flooded by Riley Creek, a tributary to the Blanchard River. The village of Columbus Grove was flooded by Plum Creek, a small tributary to the Ottawa River. The Blanchard and Ottawa Rivers flow into the Auglaize River, a tributary to the Maumee River. The city of Bucyrus was flooded by the Sandusky River. The village of Carey was flooded by Spring Run, a tributary to Tymochtee Creek, which is a tributary to the Sandusky River. The city of Crestline was flooded by two tributaries to Paramour Creek, which is the head of the Sandusky River. The city of Mansfield was flooded by Touby Run, a tributary to Rocky Fork Mohican River, and by the Rocky Fork Mohican River. The city of Shelby was flooded by Black Fork Mohican River. The Rocky and Black Forks of the Mohican River are part of the Muskingum River watershed.

Because of the magnitude of and damages from this flood, a Presidential Disaster Declaration, FEMA-1720-DR (Federal Emergency Management Agency, 2007), was declared for eight counties (fig. 2) on August 27, 2007. Seven counties required both Individual³ and Public⁴ Assistance, and one required only Individual Assistance. A Presidential Disaster Declaration puts into motion long-term Federal recovery programs to assist individuals, businesses, and public entities.

The U.S. Geological Survey (USGS), in cooperation with the Federal Emergency Management Agency (FEMA), completed a study to document this historic flood by describing pertinent flood information including high-water marks, peak-streamflow and stage data, estimated recurrence intervals⁵,

³ "Individual Assistance" is defined as assistance to individuals and households (Federal Emergency Management Agency, 2008a).

⁴ "Public Assistance" is defined as assistance to state and local governments and certain private nonprofit organizations for emergency work and the repair or replacement of disaster-damaged facilities (Federal Emergency Management Agency, 2008b).

⁵ Recurrence interval is the average length of time within which the magnitude of a given flood or rainfall event will be equaled or exceeded (Riggs, 1968). It is determined as the reciprocal of the probability that a given event will be equaled or exceeded in any given year. For example, the 100-year flood has a 0.01 (1 percent) probability of being equaled or exceeded in any given year. Rainfall recurrence intervals are reported as a function of both magnitude and storm duration, whereas flood recurrence intervals are reported only as a function of magnitude.

¹U.S. Geological Survey, Columbus, Ohio

²National Weather Service, Cleveland, Ohio

2 **Floods of August 21–24, 2007, in Northwestern and North-Central Ohio**

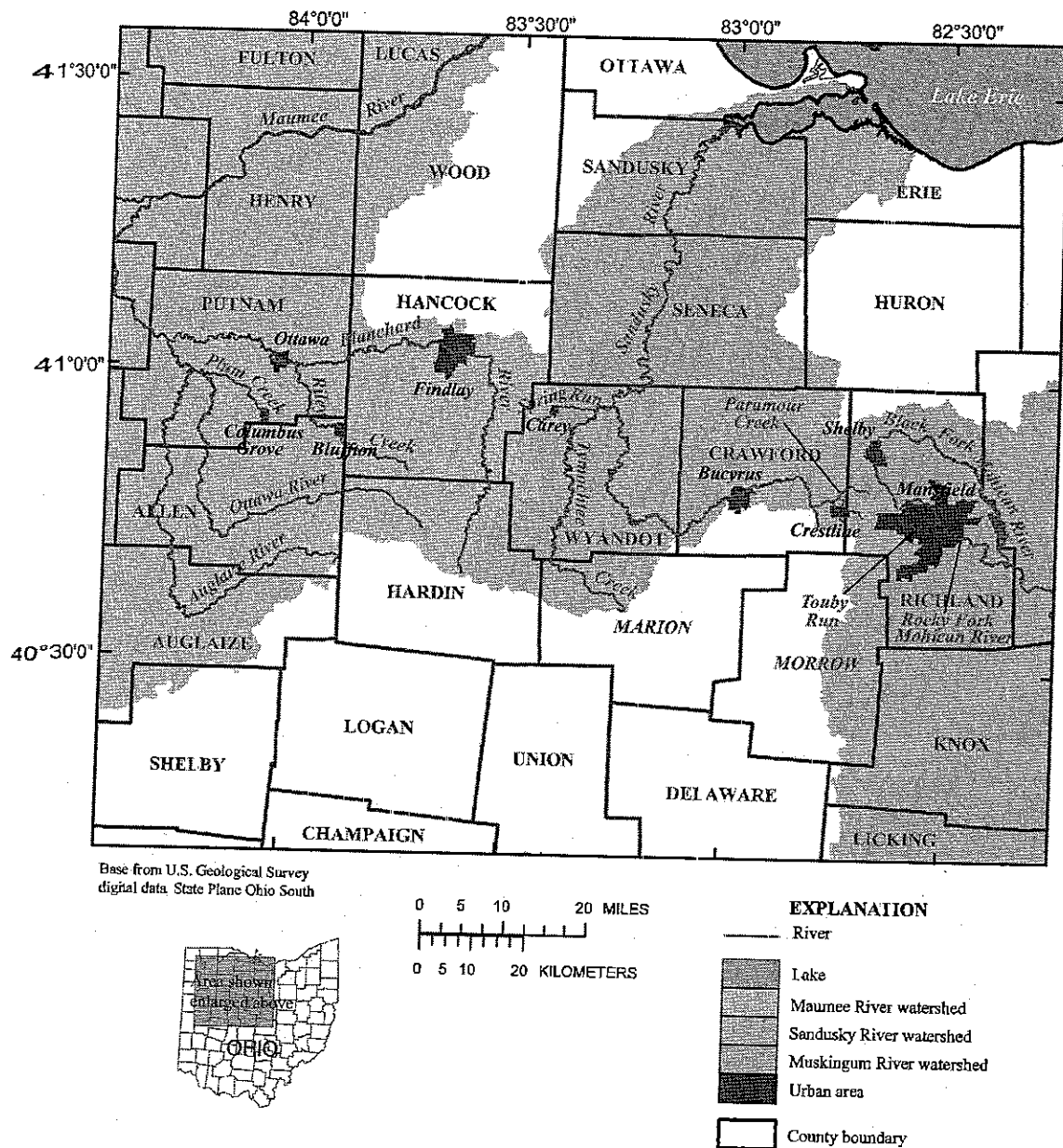
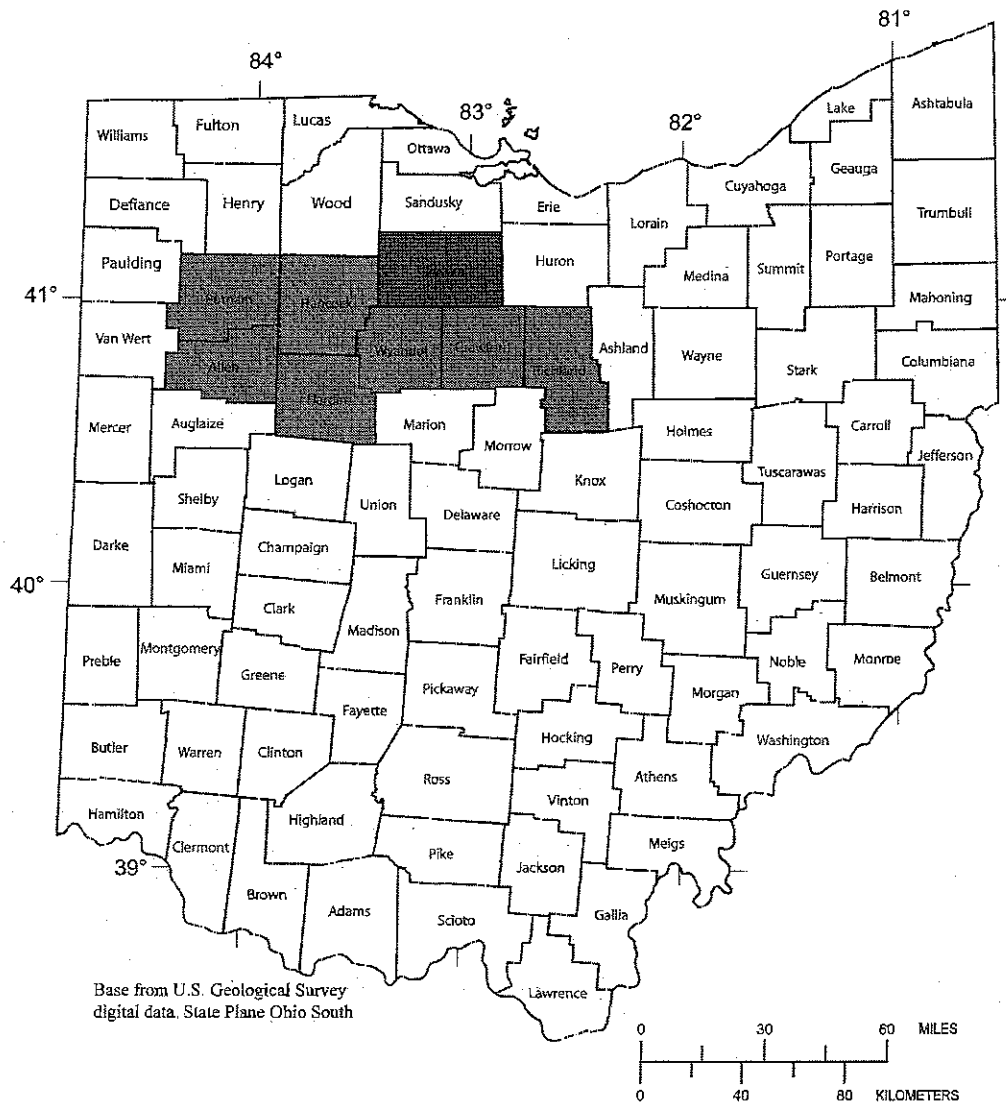


Figure 1. Location of nine communities within disaster area in northwestern and north-central Ohio in which the U.S. Geological Survey collected high-water-elevation data.



EXPLANATION



-  Individual Assistance (includes damage to private property)
-  Individual and Public Assistance (includes damage to private and public property)

Figure 2. Ohio counties declared as disaster areas under FEMA declaration 1720 (modified from Federal Emergency Management Agency, 2008).

and maps of estimated flood inundation. Documentation of flood events can assist Federal, State, and local agencies in making informed decisions on flood-plain management and flood-emergency practices.

Purpose and Scope

This report describes the meteorological and hydrologic conditions leading to the floods, magnitude and frequency estimates for selected rainfall and stream sites, and damage estimates for the affected communities. The USGS located 421 high-water marks along approximately 44.5 mi of streams through the nine communities affected by the floods. The affected communities, main flooding source, extent of the high-water marks, and number of high-water marks within each community are described herein. Peak-streamflow and recurrence-interval estimates were determined for the main flooding source within each of the nine communities. Peak gage-height, streamflow, and recurrence-interval estimates were determined at 22 streamgages in and around the flooded area, 3 of which are located within the 9 communities.

Meteorological Events Associated With the Flood

The National Oceanic and Atmospheric Administration (NOAA) divides Ohio into 10 regions based on similar climatological characteristics. The storm of August 19–22, 2007, mainly affected parts of five regions in the northwest quarter of the State. The state and regional rainfall totals are summarized from the “Monthly Water Inventory Report for Ohio” from the Ohio Department of Natural Resources (ODNR). The conditions for the 3 months before the August 2007 storm are summarized in the May, June, and July 2007 reports (Kirk, 2007a, b, and c). The monthly report for August 2007 (Kirk, 2007d) includes the rainfall data from this storm and associated flood

Antecedent Climatic Conditions

In general, the weather leading up to the storm was dry. Precipitation in the area was below normal⁶ for May, June, and July. The State average precipitation amounts for these months in 2007 were 1.60, 2.92, 3.72 in., respectively. These State averages were 41, 76, and 91 percent of normal, respectively. May 2007 ranked as the third driest May over 125 years of record (Kirk, 2007a). June was also dry, with Putnam County receiving the least amount of precipitation in the State at 0.41 in. (Kirk, 2007b). In July, Ohio received some precipitation from scattered showers and thunderstorms. Much of Ohio received 0.25 to 0.50 in. of rain from July 4 through 6 and another 0.25 to 0.50 in. on July 10 and 11. Most of the State

also received 1 to 3 in. between July 17 and July 28. During late July, the greatest amount of rain fell in an area from northwestern to east-central and southeastern Ohio (Kirk, 2007c). The 10 climatic regions of Ohio, the average precipitation and percent of normal of each region, and an isohyetal plot of the total precipitation for July are shown in figure 3A.

The “Monthly Water Inventory Report” for August (Kirk, 2007d) includes the rainfall during August 19–25 in the monthly totals. The precipitation for August was above normal for most of Ohio except the southern part of the State (fig. 3B). The statewide average was 5.75 in., 2.31 in. above normal. Precipitation was heaviest in the Northwest climatic region with a total of 10.10 in., which was 6.91 in. above normal. August 2007 was the seventh-wettest August during 125 years of record for the State as a whole. Regionally, this was the wettest August of record for the Northwest, North-Central, and Northeast climatic regions of Ohio. Upper Sandusky (Wyandot County) reported 13.77 in. and Pandora (Putnam County) reported 13.61 in. of precipitation in August. Radar estimates show that localized areas in Wyandot County probably received more than 15 in. of rain for the month, and unofficial reports indicated more than 17 in. (Kirk, 2007d).

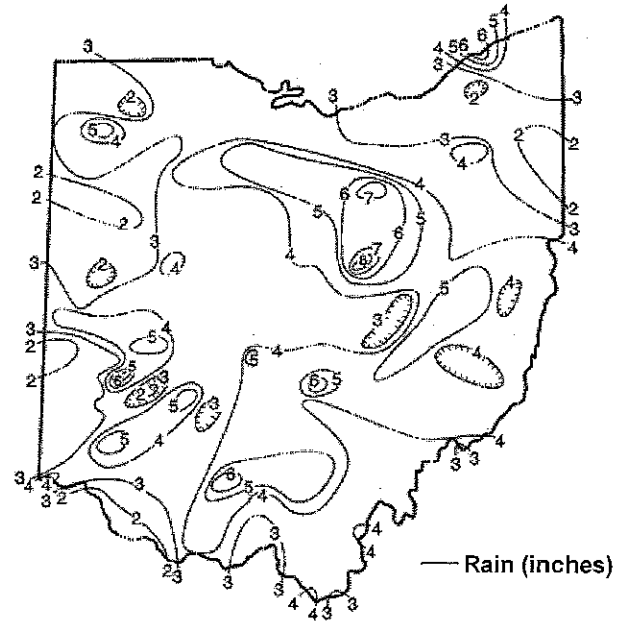
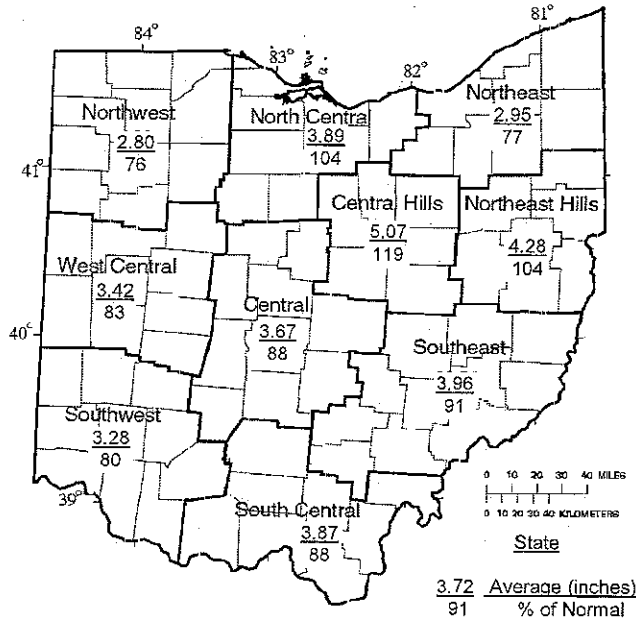
The precipitation fell as showers and thunderstorms and varied greatly across the State. The first significant rain of the month occurred on August 5. Approximately 0.5–1.5 in. fell from northwestern to southeastern Ohio as showers and thunderstorms. During August 7–9, another storm generally dropped 1.5–3.0 in. of rain, with as much as 5.0 in. in some locations in northern Ohio. The most significant precipitation fell during August 19–22, with the northeastern two-thirds of Ohio receiving 1 to 3 in. of rain. A large area in northwestern and north-central Ohio received 3–5 in. of rain, with as much as 8–10 in. reported at some locations (Kirk, 2007d).

The Storm of August 19–22, 2007

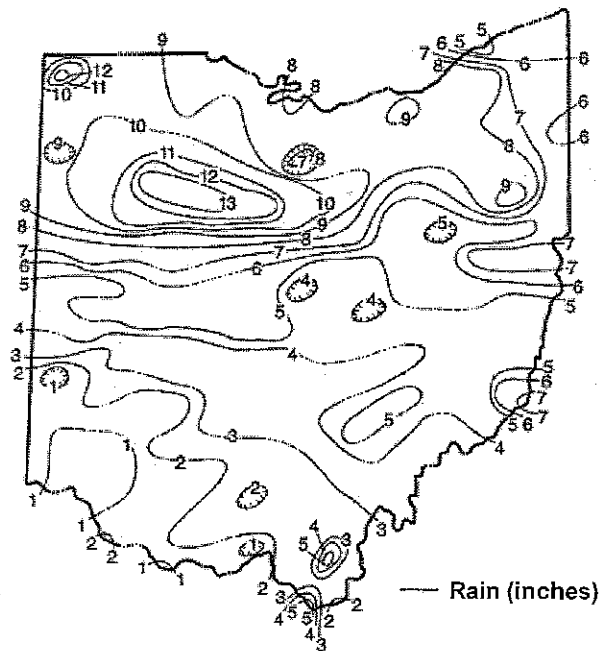
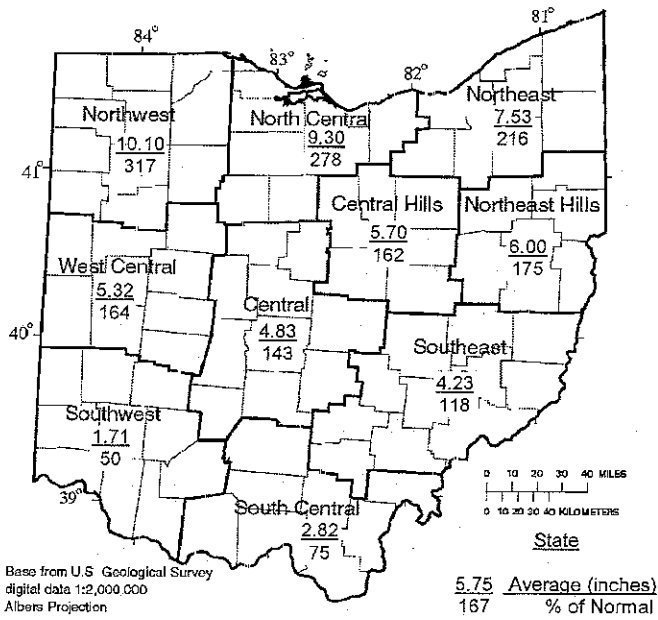
The flooding that affected northwestern and north-central Ohio was caused primarily by the interaction between tropical moisture associated with the remnants of Tropical Storm Erin and an east-west-oriented stationary front that stalled over northern Ohio. Several waves of slow-moving thunderstorms moved across northwestern and north-central Ohio from the evening of Saturday, August 18, through the morning of Wednesday, August 22, producing widespread rainfall totals in excess of 4 in. across much of northwestern and north-central Ohio. The heaviest rainfall during the 5-day storm event fell from the evening of August 20 through the morning of August 21, with as much as 10 in. in 10 hours near the Upper Sandusky area (National Climatic Data Center, 2008). The 7-day precipitation totals for the area from August 19–25, 2007, based on data from 68 NWS rainfall stations (National Oceanic and Atmospheric Administration, 2007), are shown in figure 4. Rainfall intensities and recurrence intervals for selected National Weather Service (NWS) stations (National Weather Service, 2008) from the storms that affected Ohio from August

⁶ “Normal” refers to the average value for the period 1951–2000 (Kirk, 2007 a, b, c, and d).

A: JULY



B: AUGUST



Base from U.S. Geological Survey digital data 1:2,000,000 Albers Projection

Figure 3. Regionally averaged monthly total precipitation and percentage of normal precipitation for the 10 climatic regions and the monthly hyetograph of Ohio by National Weather Service for July and August 2007 (from Kirk, 2007c, d).

6 Floods of August 21–24, 2007, in Northwestern and North-Central Ohio

19 to August 25 are listed in table 1. The time period used in table 1 is varied in order to show the most intense period of rainfall at each of the selected rain-gage sites. The 1-day precipitation totals at the Upper Sandusky, Bucyrus, and Ottawa rain gages correspond to a greater than 1,000-year recurrence interval.

The meteorological origins of the floods can be traced back to August 16, when Tropical Storm Erin made landfall along the Texas coastline while a cold front was moving southward through Ohio. This front eventually stalled on August 18 near the Tennessee River Valley before moving back north across Ohio on August 19 as a warm front and stalling once again just south of Lake Erie on August 20. As the front retreated, a subtropical high-pressure system strengthened over the southeastern United States. The clockwise circulation around this large high-pressure area brought the copious amounts of tropical moisture associated with the remnants of Tropical Storm Erin from Texas northward through the Mississippi River Valley then eastward across the Ohio River Valley.

Rainfall began across extreme northwestern Ohio on the evening of August 18 ahead of the warm front and slowly spread south and east through the rest of northern Ohio as the front stalled during the day on August 19. Following a lull during the evening of the 19th, thunderstorms redeveloped across northern Indiana in the early morning of August 20 and moved eastward across northern Ohio along the frontal

boundary. These storms intensified during the late morning as they reached north-central Ohio, with as much as 4 in. of rain falling in less than an hour and a half from Medina County east to Mahoning County.

These storms dissipated along the eastern border of Ohio during the early afternoon as sunshine returned across Indiana and western Ohio, destabilizing the tropical airmass now in place and leading to yet another round of thunderstorms. These storms again tracked eastward along the frontal boundary, which had sagged slightly southward during the day and focused the heaviest rainfall along the U.S. 30 corridor through Ohio.

During the evening, a westerly nocturnal low-level jet⁷ formed in the wake of the afternoon storms, once again triggering new thunderstorm development in western Indiana. This low-level jet intensified and pushed into northwest Ohio during the early morning, creating a moisture-rich breeding ground for continual thunderstorm development. Storms repeatedly moved over the same areas overnight, resulting in rainfall totals of 6 to 10 in. across a wide area stretching from northwest to north-central Ohio.

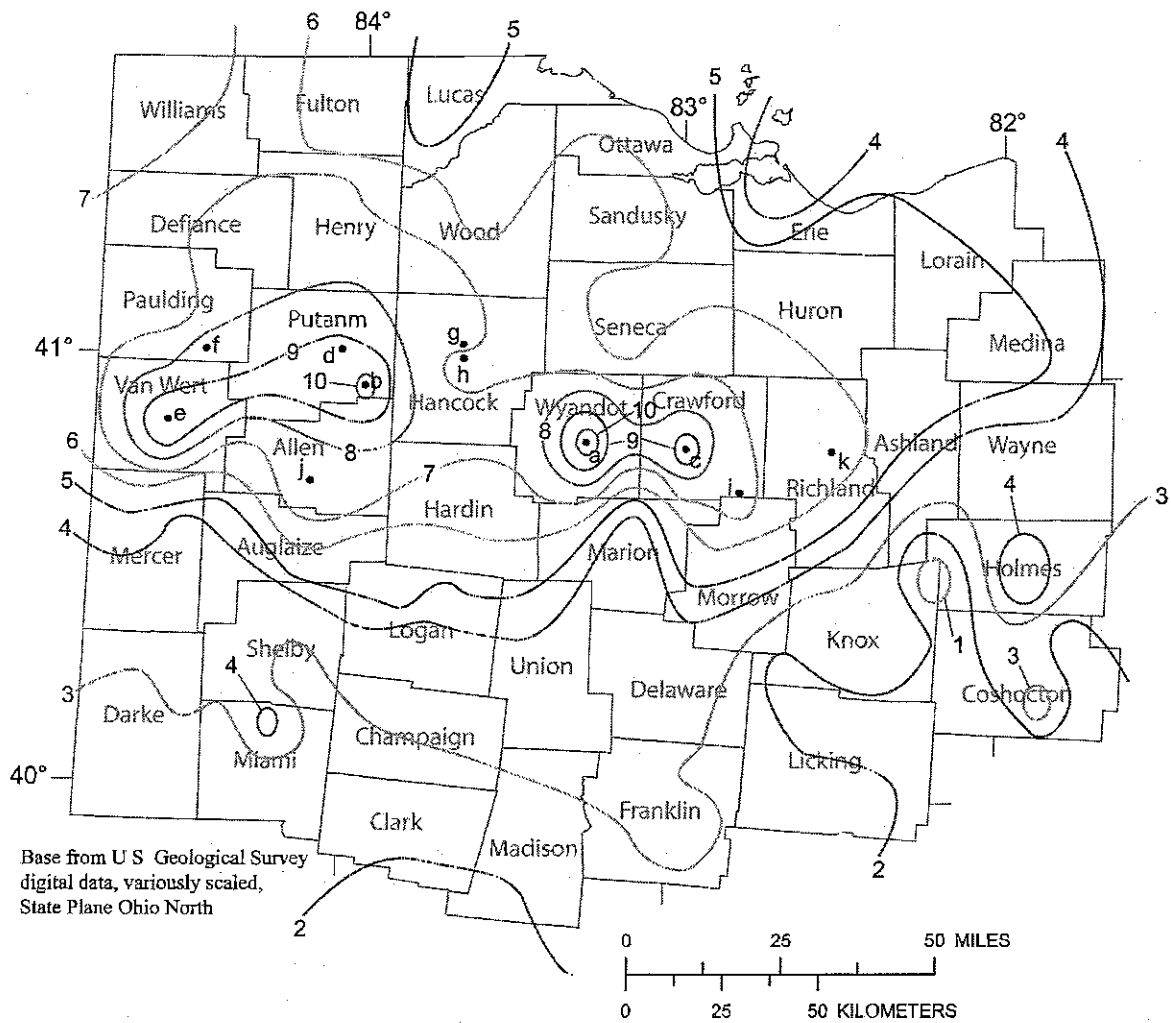
⁷ A nocturnal low-level jet is defined as a jet stream (relatively strong winds concentrated within a narrow band in the atmosphere) that forms at night, typically near the Earth's surface below an altitude of about 2 km, and usually attains speeds of less than 60 knots (Ahrens, 2003).

Table 1. Precipitation totals and recurrence intervals for selected National Weather Service rain gages in Ohio, August 19–25, 2007.

[Data from National Oceanic and Atmospheric Administration 2007; >, greater than]

| Station Name | County | Dates (2007) | Period (days) | Precipitation (inches) | Recurrence interval ¹ (years) |
|---------------------|----------|--------------|---------------|------------------------|--|
| Upper Sandusky | Wyandot | August 21 | 1 | 9.35 | > 1,000 |
| Upper Sandusky | Wyandot | August 19–25 | 7 | 10.30 | 200–500 |
| Pandora | Putnam | August 19–25 | 7 | 10.03 | 500–1,000 |
| Bucyrus | Crawford | August 19–25 | 7 | 9.14 | 200–500 |
| Bucyrus | Crawford | August 21 | 1 | 8.68 | > 1,000 |
| Ottawa | Putnam | August 19 | 1 | 8.14 | > 1,000 |
| Van Wert 1 S | Van Wert | August 19–25 | 7 | 9.98 | 500–1,000 |
| Grover Hill | Paulding | August 21 | 1 | 6.76 | 200–500 |
| Findlay WPCC | Hancock | August 19–25 | 7 | 7.61 | 100–200 |
| Findlay FAA Airport | Hancock | August 19–25 | 7 | 6.42 | 25–50 |
| Galion Water Works | Crawford | August 21 | 1 | 6.11 | 100–200 |
| Lima WWTP | Allen | August 19–25 | 7 | 7.75 | 50–100 |
| Mansfield WSO AP | Richland | August 19–25 | 7 | 6.78 | 25–50 |

¹From National Weather Service (2008).



EXPLANATION

- 4 ——— Line of equal 7-day total rainfall in inches
- a Rain-gage station name
 - a - Upper Sandusky
 - b - Pandora
 - c - Bucyrus
 - d - Ottawa
 - e - Van Wert 1 S
 - f - Grover Hill
 - g - Findlay WPCC
 - h - Findlay FAA Airport
 - i - Gallion Water Works
 - j - Lima WWTP
 - k - Mansfield WSO AP



Figure 4. Isohyetal map of 7-day rainfall totals for August 19–25, 2007, in northwest Ohio, from National Weather Service rain gages

General Description of the Floods

Water levels rose in many streams throughout the eight counties (fig. 2) as a result of the severe rain during August 19–24, 2007. Many homes, businesses, and structures were affected by floodwaters, particularly within nine communities of these counties (table 2). The USGS analyzed data from selected streamgages in and around the flooded counties to determine the extent of the flooding. Streamgage records and other streamflow-estimation techniques were used to determine the frequency and magnitude of this flood event within the disaster area. Data from streamgages in and around the disaster area are presented to show that the rivers outside and downstream from the flooded area were able to convey the water safely with minimal damages to residences and structures. The omission from this report of any rivers or communities that experienced flooding is not a reflection of the severity of the flooding or the impact on those communities but rather is due to the lack of available streamflow data and/or high-water-elevation data.

High-Water Marks

High-water marks are an indication of the water level at peak stage of a river during a flood event. They can be used to determine the peak streamflow or to calibrate peak-flow models used to determine flood-inundation areas. High-water marks are usually determined from mud, seed, or debris lines (or a combination thereof) left behind as the floodwaters receded. Examples of seed, mud, and or debris lines that indicated water elevations for this flood are shown in figure 5. Trees are generally a good place to find high-water marks because seeds and small debris get caught in the bark. Several distinct lines can be left after an event as floodwaters recede. For example, a flood with a secondary peak or an upstream bank failure can leave a distinct debris or mud line below the actual peak high-water mark (right picture figure 5B). The accuracy of the high-water marks is subjectively rated by the USGS personnel locating the mark, as outlined in Lumia and others (1986). High-water marks can be rated “excellent” (within 0.02 ft of the true high-water mark), “good” (within 0.05 ft), “fair” (within 0.10 ft), or “poor” (greater than 0.10 ft).

Table 2. Extent of high-water-mark profiles within nine communities in affected disaster area FEMA–1720–DR

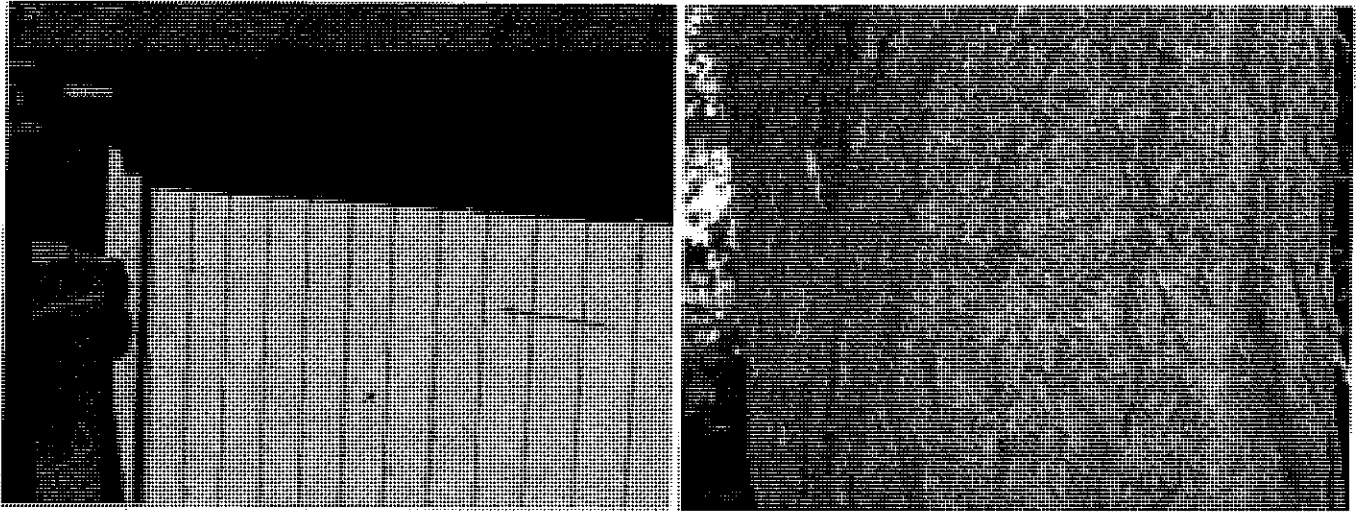
[Abbreviations: I, Interstate; SR, State Route; CR, County Road; IR, Township Road]

| Community | County | Flooding source | Downstream limit | Upstream limit | Stream miles | Number of high-water marks |
|---------------------------|----------|--|---|----------------------------|--------------|----------------------------|
| Maumee River Watershed | | | | | | |
| Bluffton | Allen | Riley Creek | Bentley Road | I-75 | 2.4 | 30 |
| Columbus Grove | Putnam | Plum Creek | Road 11 | IR 11R | 2.9 | 27 |
| Findlay | Hancock | Blanchard River | CR 140 (04189000) ¹ | IR 241 | 7.6 | 87 |
| Ottawa | Putnam | Blanchard River | Road I-9 | CR 8 | 7.5 | 32 |
| Sandusky River Watershed | | | | | | |
| Bucyrus | Crawford | Sandusky River | Kerstetter Road, CR 121 (04196000) ² | SR 30 | 4.6 | 44 |
| Carey | Wyandot | Spring Run | IR 100A | SR 15 | 2.9 | 30 |
| Crestline | Crawford | West unnamed tributary to Paramour Creek | West Main Street, SR 30 N | West Bucyrus Street, CR 35 | 1.1 | 6 |
| | | East unnamed tributary to Paramour Creek | Oldfield Road, SR 61 | Norfolk Southern Railroad | 1.9 | 18 |
| Muskingum River Watershed | | | | | | |
| Mansfield | Richland | Rocky Fork Mohican River | Lucas Road, SR39 | Bowman Street | 6.4 | 53 |
| | | Touby Run | Mouth | Home Road | 4.3 | 51 |
| Shelby | Richland | Black Fork Mohican River | London West Road/CR58 | Mickey Road | 2.9 | 43 |

¹ USGS streamgage Blanchard River near Findlay, Ohio

² USGS streamgage Sandusky River near Bucyrus, Ohio

A



B



C

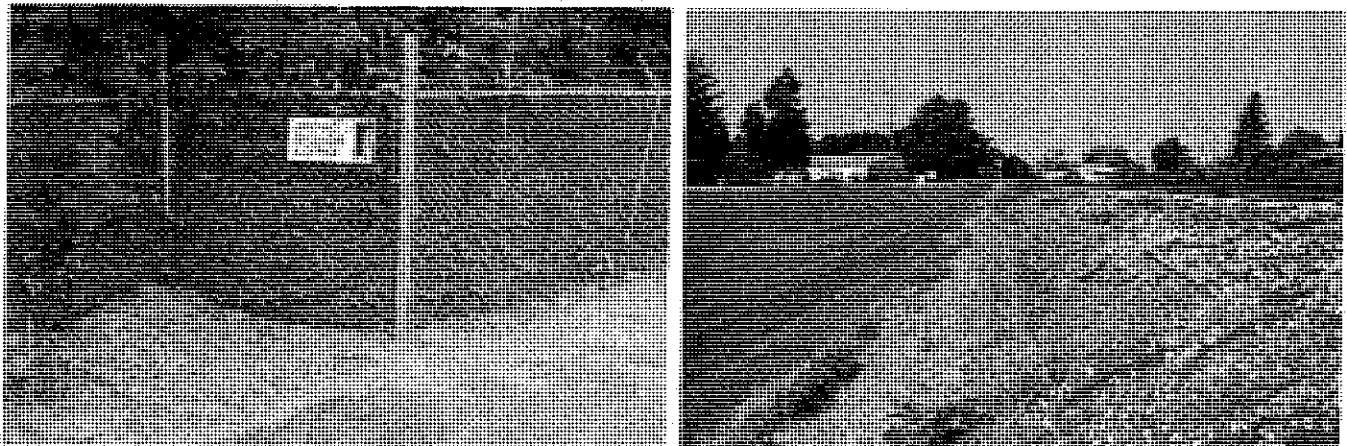


Figure 5. Examples of lines used as high-water marks at selected locations in the flooded area *A*, Seed line on buildings or trees. *B*, Mud lines on buildings. *C*, Debris lines on fence or ground.

The USGS located and surveyed 421 high-water marks along approximately 44.5 mi of streams within the 9 communities flooded in this event (figs. 6–14, at back of report). All high-water marks (table 3, at back of report) were surveyed and referenced to the North American Vertical Datum of 1988 (NAVD 88) and the North American Datum 1983 (NAD 83). The elevations of the high-water marks were determined by use of a Global Positioning System (GPS) and differential leveling. The initial horizontal position of each mark was determined by handheld GPS units and then repositioned directly on aerial photographs in a Geographical Information System (GIS).

To determine the high-water profile, a reference distance and elevation must be associated with each high-water mark. The reference distance is usually estimated by the distance along each stream's main channel from a selected location, usually the mouth or a bridge. Flood profiles were determined for each stream in the nine communities by this method (figs. 15–25, at back of report) except for the city of Ottawa. In and near Ottawa, the main channel of the Blanchard River has a high degree of meandering relative to the flood plain and, at several locations, the main-channel flow is against the general direction of the floodflow; therefore, the horizontal distance was estimated to align with the majority of the floodflow across the flood plain.

The USGS created maps of estimated flood inundation superimposed on aerial photographs for the nine communities (figs. 26–34, at back of report). The estimated flood-inundation areas were determined by the high-water-mark elevation data placed on a Triangulated Irregular Network (TIN) generated from LIDAR⁸ data. The extent of this flood on the tributaries to the main flooding source may be greater than shown in the figures because high-water marks were not collected on the tributaries.

Flood Stages and Streamflows

The USGS examined the streamflow data from 22 streamgages (table 4 and fig. 35, at back of report) that were in and around the area affected by this storm. The USGS located and surveyed high-water marks around four streamgages in the flooded area: two active streamgages (Blanchard River near Findlay 04189000 and Sandusky River near Bucyrus 04196000); one discontinued (Touby Run at Mansfield 03130500); and one stage-only⁹ (Blanchard River at Ottawa 04189260). Two more streamgages (Sandusky River near Upper Sandusky 04196500 and Tymochtee Creek at Crawford 04196800) are within the counties of the disaster declaration, but no high-water marks were collected. The remaining streamgages are listed to present the areal extent of the flooding.

⁸ LIDAR (Light Detection and Ranging) is an optical remote-sensing technique used to determine ground elevations. The data were collected as part of the Ohio Geographically Referenced Information Program (OGRIP).

⁹ A stage-only streamgage records the water level only; streamflow is not computed.

Streamflow at a streamgage is generally determined by a rating curve, which is the relation between river stage, or gage height, and streamflow. Rating curves are usually developed by mathematically relating measured gage heights and corresponding measured streamflows—collectively termed “input points”—over a range of flows (Rantz and others, 1982). Streamflow between or beyond the input points is then determined by interpolation or extrapolation. Ideally, the measurements should span the entire probable range of flows at the gage, but high-flow data are sometimes difficult or unsafe to collect. Extrapolating the rating curve beyond the highest data point can lead to large errors in streamflow estimates (Rantz and others, 1982). Techniques to define high-streamflow data points on a rating curve are available by applying the energy and continuity equations at specific locations when direct measurements are not possible, practical, or safe. By indirectly determining the streamflow on the basis of high-water marks, the rating curve can be defined for extreme floodflows without physically measuring the flow during dangerous measurement conditions. Indirect methods also can be used to determine streamflow at ungaged locations where streamflow data are unavailable. Streamflows for the August 2007 Ohio event were determined by the rating-curve method at 20 of the 22 streamgages and are presented in table 4 (at back of report).

The USGS was able to directly measure the streamflow and gage height at several different water levels at both the Blanchard River near Findlay and Sandusky River near Bucyrus gages during the August 2007 flood. Direct measurements of stage and flow were made at the Blanchard River near Findlay streamgage at the peak gage height of 18.46 ft (772.22 ft, NAVD 88) and a streamflow of 14,500 ft³/s at about 1:00 p.m. on August 22, 2007. Only once, during the 1913 flood, was there a higher estimated stage and streamflow (18.50 ft and 22,000 ft³/s) in the 81 years of record¹⁰. Unfortunately, conditions at the Sandusky River near Bucyrus streamgage were considered unsafe when the streamgage and roadway were submerged by the flood; thus, field crews were unable to directly measure the peak streamflow. Measurements before and after the peak gage height, as well as high-water marks at the Bucyrus streamgage, helped to define the flood hydrograph for this event. As derived from surveyed high-water marks and indirect methods, the gage height and streamflow estimated for the Sandusky River near Bucyrus streamgaging station were 12.17 ft (967.21 ft, NGVD 29) and 15,800 ft³/s. The peak streamflow was estimated to have occurred at about 10:00 p.m. on August 21, 2007; these were the highest recorded gage height and streamflow estimate at this site for the 55 years of record¹¹. Because the Touby Run at Mansfield streamgage was not active and the Blanchard River at Ottawa streamgage was

¹⁰ The Blanchard River at Findlay streamgage was operated from October 1923 until present day. The 1913 flood information was determined by indirect methods for this gage site and was not part of the continuous systematic record.

¹¹ The Sandusky River near Bucyrus streamgage was operated from August 1925 to November 1935, July 1938 to December 1951, December 1963 to September 1981, and October 1995 to present day.

a stage-only gage, direct measurements were not done at these locations. Surveyed high-water marks on the upstream and downstream side of the concrete weir at the Touby Run at Mansfield streamgage site indicated a peak gage height of 5.29 ft. The streamflow was estimated to be 1,200 ft³/s and was based on extrapolating the rating curve and an indirect method using a weir equation (Hulsing, 1967). The peak streamflow was estimated to have occurred on August 21, 2007; the recorded gage height and the streamflow estimate at this site were the highest for the 33 years of record¹². The Blanchard River at Ottawa streamgage recorded a gage height of 31.70 ft¹³ on August 23, 2007. No streamflow information was available for the Blanchard River at Ottawa streamgage; however, by use of an

indirect method, the streamflow was estimated to be between 25,600 and 49,400 ft³/s.

An estimated streamflow was computed by an indirect method at seven of the nine communities, owing to the lack of streamflow data (table 5). Selection of the most appropriate indirect method was based on the quality of the high-water marks, required stream-geometry data, and channel characteristics associated with the particular indirect method. Four indirect methods were used to determine streamflow at the selected locations in the seven communities: (1) the slope-area method, which uses a uniform-flow equation based on channel geometry, water-surface profiles, and roughness coefficients (Dalrymple and Benson, 1968); (2) the contracted-opening method, which uses the energy equation to compute the drop in water surface at bridges or channel contractions (Matthai, 1967); (3) the Manning's equation method, which uses channel characteristics and roughness coefficients (Chow, 1959); and (4) the routing method using a Hydrologic Engineering Centers River Analysis System (HEC-RAS) model to match the water-surface profile based on high-water-mark elevations (U.S. Army Corps of Engineers, 2005).

¹² The Touby Run at Mansfield streamgage was operated from August 1946 to September 1978. A peak flow was also estimated for the July 2, 1987, event.

¹³ The Blanchard River at Ottawa streamgage is a stage-only station operated from November 1995 to present. This station is a river forecast site for the National Weather Service. Historical stage data from before 1995 were obtained from the NWS Web page (National Weather Service, 2007).

Table 5. Peak streamflows and estimated recurrence-interval ranges at selected communities in the flooded area in Ohio, August 21–24, 2007.

[mi², square miles; ft, feet (above streamgage datum); ft³/s, cubic feet per second; >, greater than; N/A, not available]

| Streamflow determined at selected communities by indirect methods | | | | | |
|---|--|----------------------------------|--|---------------------------------|--|
| Community | Stream | Drainage area (mi ²) | Method for determining streamflow | Streamflow (ft ³ /s) | Estimated recurrence-interval range (years) ¹ |
| Bluffton | Riley Creek | 35.8 | Slope-area | 10,300 | > 500 |
| Carey | Spring Run | 3.51 | Contracted-opening | 597 ² | > 500 |
| Columbus Grove | Plum Creek | 17.1 | Contracted-opening | 1,780 | 100–500 |
| Crestline | West Unnamed Tributary to Paramour Creek | 5.29 | Manning's Equation | 3,000 | > 500 |
| Crestline | East Unnamed Tributary to Paramour Creek | 1.76 | Routing method (using HEC-RAS), Manning's Equation | 698 | > 500 |
| Mansfield | Rocky Fork Mohican River | 10.3 | Contracted-opening | 2,030 | > 500 |
| Ottawa | Blanchard River | 625 | Manning's Equation | 25,600 to 49,400 ³ | > 500 |
| Shelby | Black Fork Mohican River | 30.4 | Contracted-opening | 6,340 | > 500 |

¹ Recurrence-interval estimated from StreamStats (Koltun and others, 2006)

² Spring Run overflowed its banks upstream from the contracted-opening site at the Toledo Street bridge. An undetermined quantity of that overflow may have escaped into the unnamed tributary to the north, thereby bypassing the contracted-opening site. Flow from the unnamed tributary enters Spring Run approximately 300 feet downstream from Toledo Street.

³ Range based on Manning's equations at two different locations.

Recurrence Intervals

The recurrence intervals at each streamgage were estimated by comparing the peak streamflow of this event with the gage-weighted streamflow estimates as published in Koltun and others (2006). For streamgages where record was insufficient to compute a reliable recurrence-interval estimate and also for the ungaged sites, recurrence intervals were estimated by means of Ohio StreamStats (U.S. Geological Survey, 2008). Peak stage, peak streamflow, and recurrence-interval range for selected USGS streamgages for this flood event are listed in table 4 (at back of report). For stations on regulated streams, a recurrence interval is not given.

Record peak streamflow occurred on Touby Run at Mansfield (station 03130500), Sandusky River near Bucyrus (station 04196000), and Sandusky River near Upper Sandusky (station 04196500). The streamgage at Bucyrus indicated a greater than 500-year peak floodflow. At the Findlay streamgage, peak floodflow slightly exceeded the 100-year recurrence interval. Peak flows at the streamgages at Mansfield and Upper Sandusky were in the 50–100 year flood range. Recurrence intervals at the other streamgages were smaller.

The peak floodflows for the ungaged sites were compared to estimates from Ohio StreamStats to establish approximate recurrence intervals for this flood. At eight of the nine ungaged locations, the estimated recurrence interval was greater than 500 years. At the Plum Creek site in Columbus Grove, the estimated recurrence interval was between 100 and 500 years.

Flood and Storm Damages Associated With FEMA–1720–DR

Although it was not possible to determine an exact value of the damages caused by the flooding, Ohio Emergency Management Agency (Ohio EMA) was able to obtain some estimates of the extent of the damage. According to the Ohio EMA (Drew Whitehair, written commun., 2008), 8,205 households registered for assistance as a result of this flood. Damages to public property were estimated to be in excess of \$290 million. FEMA approved nearly \$124 million of assistance to aid in the repair of both public and private properties. The Small Business Administration approved an additional \$114 million in loans to aid with repair of local businesses affected by the flooding.

Summary

A severe storm swept across northwestern and north-central Ohio during August 19–22, 2007, with as much as 10 in. of rain reported in some areas. Rainfall recorded at some National Weather Service sites exceeded a 1,000-year

recurrence interval. Because of the intensity of the rainfall, several streams flooded homes and businesses in nine communities throughout the area. Eight counties were declared a Federal disaster area on August 27, 2007.

The USGS located 421 high-water marks and generated peak flood profiles on 11 streams throughout the nine communities. Peak streamflows, stages, and recurrence intervals were estimated by high-water marks and/or streamgage data at 30 locations in and around the flooded area.

The highest peak streamflow of record occurred at three streamgages: the Sandusky River near Bucyrus, the Sandusky River near Upper Sandusky, and Touby Run at Mansfield. The streamgage on the Blanchard River near Findlay recorded the second highest streamflow for the 81 years of record. Many of the streams in the selected communities of the flooded area had a peak-streamflow recurrence interval of greater than 500 years. Damage was estimated by the Ohio Emergency Management Agency at more than \$290 million.

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Tables 3 and 4, High-Water-Mark Location Maps, Flood Profiles, and Inundation Maps

[In separate files]

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

¹Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| Riley Creek near Bluffton, Ohio (distances referenced to a point 93 ft downstream from Bentley Road) | | | | | | | |
| LB17 | Left | Fair | 40° 54' 25" | -83° 53' 55" | 433 | 810.62 | Debris line on 8 in.-diameter locust tree, 7.0 ft above ground, 40 ft from stream, and 60 ft in from soybean field. |
| RB14 | Right | Poor | 40° 54' 27" | -83° 53' 53" | 645 | 810.71 | Seed line on tree, 6.3 ft above ground, at edge of channel, about 400 ft upstream from bridge. |
| LB16 | Left | Fair | 40° 54' 24" | -83° 53' 42" | 1,548 | 811.50 | Debris line on 6-in.-diameter hackberry tree, 5.6 ft above ground, about 20 ft in from soybean field, 90 ft from stream. |
| RB13 | Right | Good | 40° 54' 18" | -83° 53' 38" | 2,772 | 812.62 | Seed line on tree, 5 ft above ground, 25 ft from channel, about 300 ft upstream from powerlines. |
| LB15 | Left | Fair | 40° 54' 11" | -83° 53' 40" | 3,653 | 812.99 | Debris line on 6-in.-diameter elm tree, 5.0 ft above ground, about 40 ft from stream, in flood plain just below 2-ft culvert, in field opposite Hillcrest Dr., about 200 ft upstream from 450 Riley St. |
| LB14 | Left | Fair | 40° 54' 03" | -83° 53' 32" | 4,641 | 813.15 | Debris line on 6-in.-diameter hackberry tree, 6.2 ft above ground, 20 ft from stream in flood plain, behind 280 Riley Street, across from Pinebrook. |
| RB12 | Right | Good | 40° 54' 02" | -83° 53' 30" | 4,805 | 813.89 | Seed line on tree, about 4 ft above ground, about 15 ft from right edge of channel, behind Legton, adjacent to sewage-treatment plant. |
| LB13 | Left | Poor | 40° 53' 55" | -83° 53' 26" | 5,554 | 815.75 | Debris line on yellow pole cable stay, 2.9 ft above ground, at southeast corner of Riley and Spring Streets. |
| RB11 | Right | Good | 40° 53' 57" | -83° 53' 23" | 5,637 | 816.04 | Seed line on tree, 6 ft above ground, on streamward side of pond and gravel path, across pond (Buckeye Lake) from picnic pavilion, about 300 ft upstream from closed truss bridge at Bluffton Legton Post. |
| LB12 | Left | Fair | 40° 53' 52" | -83° 53' 17" | 6,357 | 816.44 | Debris line on apple tree, 3.8 ft above ground, 40 ft from stream, behind 112 Riley St., behind gray shed. |
| LB11 | Left | Poor | 40° 53' 50" | -83° 53' 15" | 6,540 | 816.52 | Abrasion on 6-in.-diameter hackberry tree, 30 ft from stream, 300 ft downstream from Main St. bridge, between 106 and 108 Riley St., behind red shed. |
| RB10 | Right | Fair | 40° 53' 50" | -83° 53' 10" | 6,917 | 817.52 | Drift line on ground, 150 ft upstream of Main St. bridge. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB09 | Right | Fair | 40° 53' 37" | -83° 53' 13" | 8,372 | 821.48 | Seed line on tree, 1.5 ft above ground, 75 ft downstream from SR 103 bridge. |
| LB10 | Left | Fair | 40° 53' 36" | -83° 53' 17" | 8,674 | 823.88 | Debris line on wood fence, 3.5 ft above ground, 5 ft from end of fence, at northeast corner parking lot of community market. |
| RB08 | Right | Good | 40° 53' 29" | -83° 53' 19" | 9,374 | 824.14 | Mud line on back corner (downstream side) of red feed store (Kent), just downstream of Cherry St. bridge (building will be destroyed after harvest, end of Nov.) |
| LB09 | Left | Good | 40° 53' 33" | -83° 53' 25" | 9,374 | 824.34 | Mark on left doorframe by owner of M&R Plumbing and Heating, 0.8 ft above ground, on Cherry St. |
| RB07 | Right | Fair | 40° 53' 28" | -83° 53' 33" | 10,513 | 825.25 | Seed line on large tree, about 7 ft above ground, downstream side of Harmon football field, 100 ft upstream from bridge. |
| LB08 | Left | Good | 40° 53' 29" | -83° 53' 35" | 10,513 | 825.29 | Mud/seed line on inside of entrance door to Moreys, at corner of College and Triplett Dr. |
| LB07 | Left | Fair | 40° 53' 24" | -83° 53' 36" | 10,919 | 823.84 | Debris line on base of utility pole #711C2135, 0.8 ft above ground, on Triplett Dr. |
| RB06 | Right | Good | 40° 53' 23" | -83° 53' 29" | 10,919 | 825.36 | Mud line on Harmon Field football scoreboard support I-beam, 4.55 ft above ground, streamward side. |
| LB06 | Left | Fair | 40° 53' 17" | -83° 53' 35" | 11,584 | 826.29 | Debris line on chain-link fence, behind school soccer field near southeast corner, off Triplett Dr. |
| LB05 | Left | Fair | 40° 53' 16" | -83° 53' 36" | 11,684 | 827.05 | Debris line on upstream railroad tie, 180 ft west of railroad abutment. |
| RB04 | Right | Fair | 40° 53' 16" | -83° 53' 29" | 11,997 | 827.55 | Seed line on pine tree, 4.7 ft above ground, in small grove behind barn and pond, at end of South Mound St. |
| LB04 | Left | Good | 40° 53' 15" | -83° 53' 30" | 11,997 | 827.39 | Seed line on 6-in.-diameter mulberry tree, 7.9 ft above ground, 15 ft north of 2.5-ft-diameter cottonwood tree. |
| LB03 | Left | Good | 40° 53' 11" | -83° 53' 26" | 12,558 | 828.62 | Seed line on 5-in.-diameter hackberry tree, 2.4 ft above ground. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route.]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RB03 | Right | Fair | 40° 53' 13" | -83° 53' 23" | 12,558 | 828.76 | Drift line along bank on left side of gravel access drive at 192 Geiger St. |
| LB02 | Left | Fair | 40° 53' 08" | -83° 53' 23" | 12,940 | 830.07 | Seed line on 1-ft-diameter boxelder tree, 3.8 ft above ground, 30 ft from left bank. |
| RB02 | Right | Good | 40° 53' 08" | -83° 53' 21" | 13,008 | 830.26 | Seed line on 10-in.-diameter Buckeye tree, 40 ft downslope from yard edge, behind 30 Sara Ln. |
| LB01 | Left | Fair | 40° 53' 05" | -83° 53' 23" | 13,286 | 829.92 | Drift line along left bank, 20 ft from edge, 10 ft northwest of 8-in.-diameter locust tree, 120 ft downstream of bridge. |
| RB01 | Right | Good | 40° 53' 04" | -83° 53' 21" | 13,372 | 830.84 | Seed line on bridge abutment, 2 ft above gravel, 5 ft under bridge deck from downstream side of bridge. |
| Sandusky River near Bucyrus, Ohio (distances referenced to a point 90 ft downstream from County Road 121) | | | | | | | |
| L01 | Left | Fair | 40° 48' 13" | -83° 00' 20" | 100 | 967.14 | Mark observed by resident of Kerstetter Rd., on centerline of road, left bank, about 7 ft past end of guardrail. |
| L02 | Left | Fair | 40° 48' 13" | -83° 00' 21" | 119 | NA ³ | Debris line on left upstream bank of bridge, on ground, between 8th and 9th wooden guardrail-support post. |
| R01 | Right | Fair | 40° 48' 15" | -83° 00' 22" | 190 | 967.18 | Seed/mud line on tree, 6 ft above ground, upstream from small tributary, 75 ft west of river. |
| L03 | Left | Good | 40° 48' 14" | -83° 00' 21" | 226 | 963.49 | Mud line on tree, 2.5 ft above ground, 50 ft from left bank, 200 ft upstream from bridge. |
| R02 | Right | Poor | 40° 48' 15" | -83° 00' 22" | 247 | 967.19 | Mud line on 6-in.-diameter tree, 5 ft above ground, 50 ft upstream from R01. |
| L04 | Left | Fair | 40° 48' 13" | -82° 59' 52" | 2,637 | 970.31 | Seed line on 10-in.-diameter tree, 50 ft from river bank, about even with western fence line of Bucyrus sewage-treatment plant. |
| L05 | Left | Good | 40° 48' 09" | -82° 59' 32" | 4,345 | 972.24 | Mud line on vertical 6 in. x 6 in. post, next to main vertical pole for cable bridge, on left bank, upstream side of bridge. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route.]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| R06 | Right | Fair | 40° 48' 12" | -82° 59' 28" | 4,525 | 972.82 | Mud line on tree, 5 ft above ground, in small grove at edge of flood plain, just below shelterhouse, 500 ft downstream from HWM R05. |
| R05 | Right | Excellent | 40° 48' 11" | -82° 59' 23" | 4,964 | 973.05 | Mud line on back side of circular "Rotary International" sign, 0.94 ft above bottom of sign, at "Field of Dreams" baseball complex. |
| R04 | Right | Excellent | 40° 48' 11" | -82° 59' 19" | 5,758 | 972.98 | Mud line on red entry door to red brick concession-stand building, 4.01 ft above metal weatherstripping, at baseball field in Aumiller park. |
| R03 | Right | Excellent | 40° 48' 11" | -82° 59' 18" | 5,758 | 973.00 | Mud line on red entry door to red brick concession-stand building, 4.05 ft above metal weatherstripping, at baseball field in Aumiller park. |
| L06 | Left | Good | 40° 48' 02" | -82° 59' 12" | 5,988 | 973.08 | Seed line on 24-in.-diameter double-trunk tree, in ravine of cemetery, cemetery side of tree, on path toward river. |
| L07 | Left | Good | 40° 48' 11" | -82° 59' 09" | 6,615 | 973.22 | Seed line on 11-in.-diameter black walnut tree, in park, stream side of tree. |
| R07 | Right | Fair | 40° 48' 12" | -82° 59' 15" | 6,723 | 973.18 | Mud line on "WRONG WAY" sign, at upstream end of baseball field, near ford across Blanchard River. |
| L08 | Left | Excellent | 40° 48' 16" | -82° 59' 09" | 7,134 | 973.22 | Seed line on twin tree, on left bank next to grass field near pedestrian bridge and ford, about 400 ft from river. |
| L09 | Left | Excellent | 40° 48' 25" | -82° 59' 02" | 8,798 | 974.16 | Mud line on screen of small shed behind 706 West Warren St., upstream side of shed. |
| R08 | Right | Fair | 40° 48' 33" | -82° 59' 03" | 9,374 | 974.70 | Seed line on tree, 3 ft above base, at edge of flood plain just upstream from Victory Lane. |
| 11 | Left | NR | 40° 48' 31" | -82° 58' 58" | 9,738 | 975.59 | Mud line on house trailer, downstream from W. Mansfield Rd. bridge. |
| 12 | Left | NR | 40° 48' 32" | -82° 58' 55" | 9,947 | 975.71 | Mud/seed line on sign, just downstream from W. Mansfield Rd. bridge, on left bank. |
| 13 | Right | NR | 40° 48' 33" | -82° 58' 56" | 9,947 | 975.69 | Seed line on downstream right bank abutment. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| 16 | Left | NR | 40° 48' 32" | -82° 58' 54" | 9,977 | 975.73 | Seed line on downstream left bank abutment. |
| 15 | Right | NR | 40° 48' 33" | -82° 58' 55" | 10,092 | 976.03 | Seed line on right upstream abutment. |
| 10 | Left | NR | 40° 48' 32" | -82° 58' 52" | 10,092 | 976.80 | Seed line on house with blue painted block and white vinyl siding. |
| 14 | Right | NR | 40° 48' 35" | -82° 58' 56" | 10,442 | 976.56 | Seed line on blue door on upstream right bank. |
| 17 | Right | NR | 40° 48' 35" | -82° 58' 52" | 10,480 | 976.48 | Seed line on tree upstream right bank, just downstream from railroad bridge. |
| 21 | Right | Excellent | 40° 48' 39" | -82° 58' 46" | 11,015 | 977.81 | Seed line on downstream right low steel of West Mary St. bridge, about 0.3 ft higher than low steel. |
| 22 | Right | Excellent | 40° 48' 39" | -82° 58' 46" | 11,075 | 977.89 | Seed line on upstream right low steel of West Mary St. bridge, about 0.4 ft higher than low steel. |
| 20 | Right | Excellent | 40° 48' 40" | -82° 58' 48" | 11,107 | 978.59 | Seed line on rear support and lattice of balcony, behind 400 West Mary St. |
| 23 | Left | Excellent | 40° 48' 40" | -82° 58' 43" | 11,257 | 978.67 | Mud line on concrete block of loading area, under concrete overhang, behind Quinn's Rental at upstream left side of West Mary St. bridge. |
| 24 | Left | Excellent | 40° 48' 41" | -82° 58' 40" | 11,494 | 978.84 | Seed line on left door frame of shed with "OPEN" sign above door, on downstream left bank of Tiffin St. bridge. |
| 26 | Left | Poor | 40° 48' 42" | -82° 58' 39" | 11,643 | 980.04 | Debris line on root of a 2-ft-diameter pine tree, about 2 ft above ground, about 30 ft upstream from Tiffin St. bridge. |
| 27 | Right | Fair | 40° 48' 45" | -82° 58' 42" | 11,667 | 979.73 | Seed line on right brown support pole of deck, 3 ft above ground, south side of building, under deck, at southernmost apartment of River View Apartments, on southeast corner of Tiffin and River Sts. |
| 25 | Left | Fair | 40° 48' 43" | -82° 58' 39" | 11,713 | 979.90 | Dennis line on double-trunked, V-shaped, 7-in.-diameter tree, 4 ft above ground, about 110 ft upstream from Tiffin St. bridge. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------|-------------------------|-------------|--------------|---|------------------------|---|
| 28 | Right | Good | 40° 48' 47" | -82° 58' 42" | 11,777 | 980.71 | Seed line on utility pole #781B4172, about 210 ft east of intersection of Tiffin and River Streets, between houses 320 and 322 on River St. |
| 29 | Right | Excellent | 40° 48' 47" | -82° 58' 41" | 11,866 | 980.70 | Debris line on fencepost at end of fence between houses 316 and 320 River St. |
| R10 | Right | Excellent | 40° 48' 48" | -82° 58' 35" | 12,175 | 981.02 | Mud line on window, 1.32 ft above bottom of glass, building at corner of River St. and N. Sandusky Ave., about 100 ft upstream from R09. |
| L10 | Left | Fair | 40° 48' 46" | -82° 58' 33" | 12,271 | 980.32 | Debris line on ground near bottom of gasoline marker on downstream left bank of SR 4 bridge, about 30 ft downstream from bridge. |
| R09 | Right | Excellent | 40° 48' 49" | -82° 58' 33" | 12,271 | 980.74 | Seed/mud line on window, 1.18 ft above bottom of glass, building at corner of River St. and N. Sandusky Ave. |
| R11 | Right | Excellent | 40° 48' 49" | -82° 58' 32" | 12,378 | 981.24 | Mud line on window of Good Eats restaurant on River St. |
| L11 | Left | Good | 40° 48' 46" | -82° 58' 31" | 12,438 | 980.83 | Seed line on corner fencepost of North Bucyrus Power Co., upstream side of SR 4 bridges, near 2nd strap from bottom, on fencepost nearest bridge. |
| R13 | Right | Excellent | 40° 48' 50" | -82° 58' 30" | 12,578 | 981.07 | Mud line on front entry door, 0.78 ft above bottom of glass, Flome City Ice plant. |
| R12 | Right | Excellent | 40° 48' 50" | -82° 58' 29" | 12,640 | 981.08 | Mud line on side of entry door, 1.04 ft above bottom of glass, Home City Ice plant. |
| R15 | Right | Good | 40° 48' 54" | -82° 58' 26" | 12,794 | 981.39 | Seed line on downstream side landward corner of tan pole barn, 2.17 ft above ground, behind old block barn, 100 ft landward from playground at 153 Plymouth St. |
| R14 | Right | Fair | 40° 48' 53" | -82° 58' 25" | 12,875 | 981.38 | Mud/seed line on side of blue stairs to playground slide, 8 ft above ground, in small park just upstream from Home City Ice. |
| R16 | Right | Fair | 40° 48' 53" | -82° 58' 23" | 13,053 | 977.78 | Mud line on utility pole 78102-110, 3 ft above ground, adjacent to park and 202 Blicke St. |
| R17 | Right | Excellent | 40° 48' 49" | -82° 58' 19" | 13,600 | 981.57 | Mud line on window, 2.2 ft above bottom of glass, streamward side of house at 519 N. Lane Ave. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route.]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| L12 | Left | Excellent | 40° 48' 42" | -82° 58' 19" | 13,620 | 976.56 | Seed line under North Lane St. bridge left bank, 10 ft upstream from downstream side of bridge. |
| R18 | Right | Good | 40° 48' 49" | -82° 58' 18" | 13,712 | 981.55 | Mud line on plywood door cover, 5.48 ft above door sill, in brick building across road from 519 N. Lane Ave. |
| L13 | Left | Good | 40° 48' 41" | -82° 58' 18" | 13,779 | 982.14 | Mud line on 30-in.-diameter tree, 75 ft upstream side of N. Lane St. bridge. |
| R19 | Right | Excellent | 40° 48' 43" | -82° 58' 16" | 13,891 | 981.80 | Mud line on sidewalk entry door, right window, 0.60 ft from bottom of glass, at 315 Clinton St. |
| R20 | Right | Excellent | 40° 48' 44" | -82° 58' 14" | 14,071 | 981.71 | Mud line on downstream end of white pole barn, 3.87 ft above base of siding, on Clinton St. across from small brick house and just downstream from water-treatment plant. |
| R22 | Right | Excellent | 40° 48' 45" | -82° 58' 13" | 14,300 | 981.77 | Seed line on inside wall, 3.68 ft above door sill, of Bucyrus Water Treatment Plant warehouse, at upstream entry door. |
| L14 | Left | Good | 40° 48' 38" | -82° 58' 13" | 14,337 | 982.35 | Seed line on rear side of front right wheel of old wagon in front yard of house on E. Mary St. |
| R21 | Right | Excellent | 40° 48' 46" | -82° 58' 12" | 14,618 | 981.09 | Mud line on guardrail support wall, 1.41 ft above floor, inside entrance to Bucyrus Water Treatment plant, at right stairwell. |
| R23 | Right | Good | 40° 48' 55" | -82° 58' 00" | 15,650 | 983.77 | Seed line on downstream side of Waterford Glenn Office garage, 4.15 ft above ground, downstream streamward corner at Sherman and Cedar Lake. |
| L15 | Left | Good | 40° 48' 36" | -82° 57' 56" | 16,326 | 984.46 | Seed line on smallest of 3 trees, no bark, across street from 139 Hall Street |
| L16 | Left | Good | 40° 48' 43" | -82° 57' 45" | 16,957 | 984.93 | Seed line on detached shed/garage, on stream side, at house 212 Highland Ave. |
| L17 | Left | Excellent | 40° 48' 42" | -82° 57' 34" | 17,521 | 985.30 | Seed line on 10-in.-diameter crabapple tree, 10 ft from fence away from stream, behind house 1214 E. Mansfield Rd. |
| L18 | Left | Excellent | 40° 48' 49" | -82° 57' 31" | 18,324 | 985.27 | Mud line on cart path on hole #10, next to 4-ft-diameter sycamore tree next to white O.B. marker. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| L19 | Left | Excellent | 40° 48' 56" | -82° 57' 32" | 19,360 | 985.72 | Mud line on cart path on hole #11 just upstream from tee box. |
| L20 | Left | Fair | 40° 49' 08" | -82° 57' 31" | 20,979 | 986.13 | Seed/mud line on tree with crack in base upstream side of hole #13 green. |
| R25 | Right | Good | 40° 49' 14" | -82° 57' 31" | 21,630 | 986.32 | Seed line in tree overhanging dirt road at 3229 Plymouth Rd. |
| L21 | Left | Good | 40° 49' 16" | -82° 57' 59" | 24,044 | 987.95 | Seed/mud line on 24-in.-diameter tree down hill from hole #3 green. |
| L22 | Left | Good | 40° 49' 19" | -82° 57' 48" | 24,888 | 988.45 | Seed/mud line on 36-in.-diameter sycamore tree, 75 ft downstream from SR 30. |
| R24 | Right | Good | 40° 49' 22" | -82° 57' 52" | 24,888 | 988.33 | Seed line on 18-in.-diameter sycamore tree, near fence line at SR 30, 100 ft from stream. |
| West unnamed tributary to Paramour Creek near Crestline, Ohio (distances referenced to a point 91 ft downstream from State Route 30) | | | | | | | |
| W1 | Left | Fair | 40° 47' 38" | -82° 45' 15" | 156 | 1121.95 | Seed line on tree, 2.87 ft above ground, about 60 ft streamward of mailbox for 7620 SR30 N., about 40 ft straight in from telephone pole 11008, on upstream side of road. |
| W2 | Right | Fair | 40° 47' 28" | -82° 45' 11" | 947 | 1123.10 | Seed line on tree, about 3 ft above ground, near back edge of white garage, at house behind WreckCarsOnline, near 20-ft-high dirt pile. |
| W4 | Left | Fair | 40° 47' 15" | -82° 45' 09" | 2,886 | 1126.38 | Drift/debris line on small tree, 3 ft above ground, near edge of field west of lake, near waterpark, near where powerline passes overhead, 30 ft from stream. |
| W5 | Left | Poor | 40° 47' 15" | -82° 45' 03" | 3,345 | 1127.43 | Wash line on left bank of stream on northwest corner of lake. |
| W3 | Left | Good | 40° 47' 14" | -82° 44' 52" | 4,197 | 1130.86 | Water mark, 1.97 ft above wood stake, on right side of steps leading to 324 Park Rd. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| W6 | Left | Fair | 40° 47' 07" | -82° 44' 49" | 5,168 | 1132.15 | Drift line on fence, 1.38 ft above ground, at end of first base line. |
| East unnamed tributary to Paramour Creek near Crestline, Ohio (distances referenced to a point 74 ft downstream from State Route 61/Old Field Road) | | | | | | | |
| E17 | Left | Good | 40° 47' 52" | -82° 44' 06" | 500 | 1131.29 | Seed line on garage door, 0.52 ft above mark on sill, near left edge of door, at south side of streamward storage unit. |
| E1 | Right | Poor | 40° 47' 43" | -82° 44' 04" | 1,541 | 1133.38 | High-water location on edge of grass/walkway in front of 107F Crestline North Apartment (reported by resident who was eyewitness). |
| E2 | Left | Good | 40° 47' 38" | -82° 44' 08" | 2,031 | 1134.51 | Seed line on north side of shed, 1.88 ft above wooden stake, at 831 Crestline St. |
| E3 | Left | Good | 40° 47' 37" | -82° 44' 07" | 2,147 | 1134.55 | Seed line on fence, 1.8 ft above wooden stake, behind house south of 831 Crestline St. |
| E4 | Left | Fair | 40° 47' 29" | -82° 44' 07" | 3,201 | 1136.59 | Seed line on picnic-table leg, 0.22 ft above wooden stake, behind 705 N. Crestline St. |
| E5 | Left | Poor | 40° 47' 25" | -82° 44' 07" | 3,584 | 1137.69 | Debris line on chain, 0.85 ft above wooden hub. |
| E7 | Left | Poor | 40° 47' 21" | -82° 44' 09" | 4,031 | 1140.31 | Debris pile near streambank near abandoned bridge behind 529 Seltzer Rd., near North St. |
| E6 | Left | Fair | 40° 47' 18" | -82° 44' 09" | 4,359 | 1142.22 | Seed line on telephone pole, 6 in. above ground, near Marathon gas station. |
| E8 | Right | Excellent | 40° 47' 07" | -82° 44' 05" | 5,568 | 1146.39 | Seed line on shed, 2.85 ft above wooden hub, at 124 N Pierce St. |
| E9 | Right | Excellent | 40° 47' 06" | -82° 44' 04" | 5,655 | 1146.48 | Seed line on shed door, 1.29 ft above wooden hub, at 118 N Pierce St. |
| E10 | Right | Poor | 40° 47' 05" | -82° 44' 05" | 5,750 | 1146.36 | Drift line on fence, 2.13 ft above ground, on corner post. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier, NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| E11 | Right | Good | 40° 47' 03" | -82° 43' 57" | 6,530 | 1150.68 | Seed line on garage door, 1.18 ft above ground, at 402 E. Bucyrus St. |
| E12 | Right | Excellent | 40° 47' 02" | -82° 43' 53" | 6,809 | 1151.06 | Seed line on east side of white shed, 0.92 ft above wooden hub, behind 424 E. Bucyrus St. |
| E13 | Left | Poor | 40° 47' 00" | -82° 43' 50" | 7,175 | 1153.34 | Debris line near top of bank on Law the Florest property. |
| E14 | Left | Poor | 40° 47' 04" | -82° 43' 38" | 8,289 | 1157.16 | Mark on road near west edge of driveway at 809 Bucyrus St. (identified by owner). |
| E15 | Left | Good | 40° 47' 07" | -82° 43' 36" | 8,561 | 1158.64 | Seed line on sign at front of shop of Jon's Auto Repair. |
| E16 | Right | Excellent | 40° 47' 10" | -82° 43' 35" | 8,969 | 1158.71 | Seed line on house, 3.02 ft above wooden stake, at 822 South St., left side of large front porch. |
| Blanchard River near Findlay, Ohio (distances referenced to a point 194 ft upstream from County Road 140) | | | | | | | |
| LB26 | Left | Fair | 41° 02' 45" | -83° 42' 28" | -7,624 | 768.52 | Seed/mud line on 7-in.-diameter tree, 7 ft above ground, about 20 ft downstream from downstream right wing wall. |
| RB25 | Right | Good | 41° 03' 27" | -83° 41' 17" | -95 | 771.23 | Mud line on slide in playground, 0.25 ft above second metal coupling holding slide, about 10.5 ft above ground, 13 steps up slide, at 10055 SR 224/15, "The Lighthouse," on slide behind picnic shelters. |
| LB27 | Left | Excellent | 41° 03' 20" | -83° 41' 09" | 545 | 772.57 | Mud line on "Adopt-A-Road" and "Environmental Awareness next 2 miles" sign, 0.01 ft below top of signpost mark on back of sign, sign on south side of road, drive heading east along river and Kohl's distribution center chain-link fence. |
| RB24 | Right | Good | 41° 03' 30" | -83° 41' 03" | 1,060 | 772.59 | Mud line on rear of Ace Hardware store, 1.10 ft above concrete floor, at 10205 SR224/15, southeast corner of building, stream side of garage doorframe. |
| LB28 | Left | Fair | 41° 03' 21" | -83° 41' 00" | 1,262 | 772.61 | Debris line on sign that reads "Kohl's Distribution Center Fence is Armed and Monitored," 5.6 ft above ground, 2.44 ft below top of chain-link fence, about 160 ft east of gravel drive, about 160 ft south of main road along chain-link fence. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ^a | HWM Rating ^b | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB23 | Right | Excellent | 41° 03' 29" | -83° 40' 55" | 1,506 | 772.93 | Mud line on south east corner of green Jeep semi trailer, 3.05 ft above wooden block under trailer, behind Chrysler dealership on SR 224/15. |
| LB29 | Left | Excellent | 41° 03' 19" | -83° 40' 44" | 2,613 | 773.54 | Mud line on south east corner of shed, 2.62 ft above bottom of corner molding, at 10566 Twp. Rd. 89, on north side of road, just west of two-car garage, just east of another shed. |
| RB22 | Right | Fair | 41° 03' 25" | -83° 40' 40" | 2,793 | 773.65 | Mud line on semi trailer next to garage, 1.80 ft above asphalt, behind house at 7650 Howard St. |
| LB30 | Left | Good | 41° 03' 13" | -83° 40' 42" | 3,309 | 774.42 | Mud line on siding, 4.63 ft above concrete, about 0.02 ft higher than bottom of siding, most southeast loading bay, about 18 ft northwest of walkthrough door. |
| RB21 | Right | Good | 41° 03' 16" | -83° 40' 29" | 4,194 | 774.55 | Mud line on yellow-sided garage, 4.43 ft above bottom of siding, at 7793 Howard St., just east of electric meter, south side of Howard St., south of Wal-Mart entrance. |
| LB31 | Left | Good | 41° 03' 13" | -83° 40' 29" | 4,308 | 772.59 | Mud line on yellow and black "<" sign, 0.05 ft below top of sign, on north side of TWP 89/S. River Rd., at the bend, just west of petroleum pipeline, 180 ft east of Coldwell Banker sign. |
| LB32 | Left | Excellent | 41° 03' 10" | -83° 40' 24" | 4,920 | 775.04 | Mud line on "Caution High Water" sign, 0.015 ft above T in water, on TWP 89/S. River Rd., north side of road; sign is facing to the east, about 180 ft west of intersection of Stanford Parkway and S. River Rd. |
| RB20 | Right | Excellent | 41° 03' 08" | -83° 40' 19" | 5,327 | 774.97 | Mud line on "HIGH WATER" sign, 0.07 ft below top of second "H," on Howard St., just downstream from I-75 bridge. |
| LB33 | Left | Good | 41° 03' 05" | -83° 40' 18" | 5,498 | 775.21 | Mud line on west red gate-support post, 0.95 ft below top of steel pipe, at south entrance of W.P.C. truck entrance, 70 ft east of I-75 overpass, about 80 ft south of River St. |
| RB19 | Right | Excellent | 41° 03' 06" | -83° 40' 08" | 6,182 | 775.21 | Mud line on southwest corner of house, 3.81 ft above bottom of siding, at 916 Howard St., near downspout. |
| LB34 | Left | Good | 41° 02' 53" | -83° 40' 06" | 6,782 | 775.82 | Mark on second crack in top of concrete-block sidewalk from front door, about 10 ft from front door of City of Findlay Water Pollution Control Center, at 1201 S. River St. |
| RB18 | Right | Excellent | 41° 03' 04" | -83° 39' 58" | 6,967 | 775.28 | Mud line on glass in doorframe of A-frame shed, 3.68 ft below top of door, behind 833 Howard St. |
| RB08 | Right | Excellent | 41° 03' 03" | -83° 39' 54" | 7,281 | 775.37 | Mud line on white vinyl doorframe, 0.87 ft above concrete-block foundation, behind 802 Broad Ave. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

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| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| LB07 | Left | Poor | 41° 02' 56" | -83° 39' 54" | 7,453 | 775.14 | Mud line on tree, 8.5 ft above bike-trail pavement, 110 ft downstream from Broad St. bridge. |
| RB09 | Right | Fair | 41° 02' 59" | -83° 39' 48" | 7,900 | 775.51 | Mud line on upstream center of footbridge over Howard Run, 4.25 ft above wooden deck, about 300 ft east of Broad Ave. |
| RB10 | Right | Excellent | 41° 02' 58" | -83° 39' 44" | 8,075 | 775.50 | Mud line on walk-in doorframe, 5.52 ft below top of doorframe, on doorframe of four-bay garage, past playground at River Landings Maintenance Center entrance off Broad St. |
| RB11 | Right | Poor | 41° 02' 49" | -83° 39' 36" | 9,095 | 775.57 | Mud line on small tree, 6 ft above ground, across river from Geotech grass, 50 ft northeast of bike path. |
| RB12 | Right | Fair | 41° 02' 51" | -83° 39' 26" | 9,546 | 775.95 | Mud line on inside east wall next to baseball-bat rack, 2.08 ft above concrete floor, in southwest dugout on third-base line at Swate Park baseball diamond. |
| LB06 | Left | Fair | 41° 02' 38" | -83° 39' 30" | 10,105 | 776.35 | Mud line on deck board, 0.04 ft below top of front porch deck, below mailbox at 504 River St. |
| RB13 | Right | Excellent | 41° 02' 46" | -83° 39' 18" | 10,386 | 776.29 | Mud line on metal siding, 7.15 ft below horizontal seam, 4 ft from northeast corner of northmost building at the west end of City of Findlay maintenance building on W. High St. |
| LB05 | Left | Good | 41° 02' 38" | -83° 39' 23" | 10,613 | 776.40 | Mud line on northwest corner of wooden shed, 0.22 ft below vertical brown siding, along intersection of Hurd and River St., at 430 Hurd Ave. about 40 ft east of Hurd River St. sign. |
| RB14 | Right | Good | 41° 02' 42" | -83° 39' 10" | 11,100 | 776.39 | Mud line on doorframe on walkthrough door, 0.77 ft above concrete, on City of Findlay maintenance building closest to river, at 330 N. Cory St. |
| LB04 | Left | Excellent | 41° 02' 34" | -83° 39' 17" | 11,205 | 776.56 | Mud line on northeast corner molding of house, 1.14 ft above bottom of blue vinyl siding, near garage at 111 Liberty St. |
| LB03 | Left | Excellent | 41° 02' 31" | -83° 39' 13" | 11,656 | 777.19 | Mud line on concrete-block front porch, 0.13 ft lower than bottom of vinyl siding, even with concrete porch floor, at 300 Washington St. |
| RB15 | Right | Excellent | 41° 02' 35" | -83° 39' 07" | 11,939 | 777.18 | Mud line on northeast corner of building, 4.94 ft above concrete step, 6.06 ft above sidewalk, at 133 Meeks St., on southwest corner of Meeks and Cory Sts. |
| LB02 | Left | Good | 41° 02' 31" | -83° 39' 07" | 12,002 | 777.22 | Mud line on upstream left wing wall, 2 ft upstream from upstream side of N. Cory St. bridge, near intersection of N. Cory St. and Washington St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route.]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB16 | Right | Excellent | 41° 02' 33" | -83° 39' 06" | 12,037 | 777.28 | Mud line on southeast corner of building, 4.29 ft above bottom of siding, 2 ft south of electric meter, at 131 N. Cory St. |
| LB01 | Left | Good | 41° 02' 27" | -83° 39' 03" | 12,352 | 777.51 | Mud line on PVC downspout, 1.03 ft above asphalt, 8 ft northeast of Campbell, Inc. door, behind 104 S. Main St. |
| RB17 | Right | Good | 41° 02' 31" | -83° 39' 00" | 12,621 | 777.41 | Mud line on right doorframe, 2.13 ft above gray doorstep, on building closest to upstream right side of Main St. bridge, at 115 ½ Main St. |
| 112 | Right | Excellent | 41° 02' 33" | -83° 39' 00" | 12,621 | 777.35 | Mud line on left side doorframe, 3.76 above concrete, at 131 N. Main St. |
| 100 | Left | Excellent | 41° 02' 27" | -83° 38' 59" | 12,679 | 777.70 | Mud line on the Sign Shack, 2.65 ft above ground. |
| 101 | Left | Excellent | 41° 02' 28" | -83° 38' 57" | 12,806 | 776.38 | Mud line on inside of door to stone-block pumphouse, 3.12 ft above door threshold. |
| 111 | Right | Excellent | 41° 02' 34" | -83° 38' 55" | 13,028 | 777.81 | Mud line on left side of garage doorframe, 4.74 ft above ground, north side, at 135 Clinton St. |
| 102 | Left | Excellent | 41° 02' 26" | -83° 38' 53" | 13,120 | 777.83 | Mud line on right edge of window, 4.05 ft above ground, at south side of Direct TV building. |
| 103 | Left | Excellent | 41° 02' 27" | -83° 38' 49" | 13,448 | 777.86 | Mud line on side garage door, 4.88 ft above ground, on north side of MCS Industrial Solutions building. |
| 110 | Right | Excellent | 41° 02' 33" | -83° 38' 45" | 13,703 | 778.00 | Mud line on eaves drain, 4.22 ft above ground, on east side of Community Action Commission building. |
| 105 | Left | Excellent | 41° 02' 23" | -83° 38' 48" | 13,774 | 778.19 | Mud line on right side door, 5.28 ft above ground, on south side of recreation department building. |
| 104 | Left | Excellent | 41° 02' 23" | -83° 38' 47" | 13,800 | 777.98 | Mud line on corner of building, 5.72 ft above ground, on east side of recreation department building. |
| 109 | Right | Excellent | 41° 02' 35" | -83° 38' 40" | 13,939 | 777.14 | Mud line on wall buttress, 2.95 ft above ground, at east side of white building, northwest corner of Clinton Ct. and Factory St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| 106 | Left | Excellent | 41° 02' 21" | -83° 38' 42" | 14,324 | 778.29 | Mud line on right side of right window frame, 5.39 ft above windowsill, on south side of La Riche used car lot. |
| 108 | Right | Excellent | 41° 02' 33" | -83° 38' 32" | 14,831 | 778.58 | Mud line on right-side doorframe, 1.95 ft above ground, east side of City of Findlay Plumbing Department building. |
| 107 | Left | Excellent | 41° 02' 21" | -83° 38' 31" | 14,831 | 778.51 | Mud line on metal siding, 4.77 ft above ground, on east side of west building of Findlay Central Storage, at 465 E. Main Cross St. |
| 120 | Left | Good | 41° 02' 23" | -83° 38' 26" | 15,219 | 778.53 | Mud line on left doorframe of north garage door, 5.57 ft above ground, at 507 Sandusky St. |
| 113 | Right | Excellent | 41° 02' 30" | -83° 38' 22" | 15,590 | 778.64 | Mud line on left edge of window, 3.68 ft above sill, on north side of 539 Cross Ave. |
| 119 | Left | Excellent | 41° 02' 26" | -83° 38' 16" | 15,958 | 778.34 | Mud line on northwest corner on downspout, 5.27 ft above gravel, at 625 Sandusky St. |
| 118 | Left | Excellent | 41° 02' 27" | -83° 38' 07" | 16,675 | 778.87 | Mud line on doorframe, 2.62 ft above step, on east side of garage, at 801 Sandusky St. |
| 114 | Right | Excellent | 41° 02' 32" | -83° 38' 08" | 16,740 | 778.78 | Mud line on east side of blue shed, 1.81 ft above trim, behind 705 Clinton Ct. |
| 116 | Right | Poor | 41° 02' 33" | -83° 38' 02" | 17,159 | 778.86 | Mud line on right side of basement window, 2.73 ft above ground, east side of 131 Carnahan Ave. |
| 117 | Left | Good | 41° 02' 28" | -83° 38' 01" | 17,195 | 778.93 | Seed line on southwest-corner downspout, 2.43 ft above ground, at 845 Sandusky St. |
| 115 | Right | Good | 41° 02' 33" | -83° 38' 01" | 17,223 | 778.86 | Seed line on northeast-corner pillar of picnic shelter #2, 0.88 ft above wall, behind 131 Carnahan Ave. |
| 127 | Left | Excellent | 41° 02' 28" | -83° 37' 51" | 17,901 | 778.77 | Mud line on northwest-corner downspout, 1.63 ft above ground, at 923 E. Main Cross St. |
| 121 | Right | Good | 41° 02' 38" | -83° 37' 49" | 18,690 | 779.10 | Seed line on deck, 4.18 ft above ground, next to third guardrail support, at Riverside Landings boat livery. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| 122 | Right | Fair | 41° 02' 42" | -83° 37' 47" | 18,800 | 779.06 | Seed line on wooden restraining wall, 1.75 ft above ground, at scenic overlook. |
| LB41 | Left | Good | 41° 02' 34" | -83° 37' 43" | 19,071 | 779.20 | Mud line on first bollard in roundabout drive, 1.80 ft above concrete sidewalk, at 1000 E. Main Cross St., southeast of Riverview State Farm sign. |
| 126 | Left | Good | 41° 02' 27" | -83° 37' 32" | 20,136 | 779.17 | Mud line on left garage doorframe, 1.61 ft above ground, at 1315 E. Main Cross St. |
| RB42 | Right | NR | 41° 02' 39" | -83° 37' 32" | 20,158 | 779.30 | Mud line on sixth vertical I-beam support on upstream side of bridge, 4.7 ft below wooden rail, on golf course. |
| 123 | Left | Good | 41° 02' 40" | -83° 37' 24" | 21,243 | 779.17 | Mud line on 13th guardrail support from left bank downstream edge of bridge |
| 125 | Left | Good | 41° 02' 27" | -83° 37' 21" | 22,539 | 779.17 | Mud line on left doorframe of left door, 0.4 ft below top, at 1434 E. Main Cross St. |
| 124 | Left | Poor | 41° 02' 22" | -83° 37' 08" | 23,573 | 778.92 | Seed line on speed-limit signpost, 4.74 ft above ground, across road from 1535 E. Main Cross St. |
| 128 | Left | Poor | 41° 02' 14" | -83° 36' 40" | 25,825 | 780.28 | Seed line on left doorframe of garage, 0.37 ft above ground. |
| 129 | Right | Poor | 41° 02' 24" | -83° 36' 33" | 26,754 | 780.80 | Mud line on black walnut tree, 4.01 ft above ground, between 1979 and 1989 Old Mill St. |
| 130 | Right | Excellent | 41° 02' 28" | -83° 36' 18" | 27,891 | 780.96 | Mud line on screen of gazebo, 3.50 ft above sill, behind 407 Lynshire Ln. |
| 131 | Right | Fair | 41° 02' 23" | -83° 36' 11" | 28,462 | 781.63 | Seed line on top stone step, 0.41 ft above second step of patio, behind 401 Scarlet Oak Dr. |
| 132 | Right | Excellent | 41° 02' 17" | -83° 35' 59" | 29,731 | 781.51 | Seed line on northeast corner of shed, 2.62 ft above ground, behind 2209 Honeytree Ct. |
| LB35 | Left | Good | 41° 02' 12" | -83° 35' 52" | 30,607 | 781.82 | Seed/mud line on low steel of SR 568 bridge, 0.85 ft below bottom of concrete deck of bridge, 1.70 ft above low steel, near left upstream abutment, just west of State of Ohio plate on low steel. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| LB36 | Left | Good | 41° 02' 06" | -83° 35' 39" | 31,507 | 782.16 | Seed line on concrete block, 0.76 ft below white wooden siding of barn, at 9056 Twp Rd. 208, about 16 ft east of large sliding door. |
| 133 | Right | Excellent | 41° 02' 16" | -83° 35' 37" | 31,672 | 782.00 | Mud line on northwest corner door, 1.59 ft above threshold, at Riverside Railroad Co. Hancock Historical Museum. |
| 143 | Left | Good | 41° 02' 08" | -83° 35' 30" | 32,288 | 782.39 | Seed line on left doorframe of small concrete-block shed, 2.13 ft above ground. |
| 134 | Right | Excellent | 41° 02' 08" | -83° 35' 27" | 32,583 | 782.35 | Seed line on northwest side of gas-well shed, 3.16 ft above ground, behind 15145 SR 568. |
| 142 | Left | Poor | 41° 02' 04" | -83° 35' 14" | 33,570 | 782.90 | Seed line on tree, about 6 ft above ground. |
| 135 | Right | Poor | 41° 02' 10" | -83° 35' 09" | 33,998 | 783.11 | Mud line on northeast door of barn, 1.86 ft above ground, at 15377 SR 568. |
| 141 | Left | Excellent | 41° 02' 00" | -83° 35' 00" | 36,655 | 784.62 | Seed line on concrete wall, 0.96 ft below concrete overhang, at water-intake structure for Findlay Reservoir, 7 ft north of southwest corner. |
| 140 | Left | Fair | 41° 01' 59" | -83° 34' 22" | 37,743 | 785.61 | Observed mark on road surface in middle of Twp Rd. 208, 105 ft west of 16067 Twp Rd. 208. |
| 139 | Left | Fair | 41° 01' 59" | -83° 34' 17" | 38,202 | 785.75 | Observed mark on ground in middle of driveway at 16115 Twp Rd. 208. |
| RB40 | Right | Excellent | 41° 02' 11" | -83° 34' 00" | 39,537 | 786.47 | Seed/mud line purple-martin birdhouse support, 5.22 ft below bottom of birdhouse, on east edge, by driveway of 16314 SR 568, 60 ft east of edge of driveway. |
| RB37 | Right | Good | 41° 02' 10" | -83° 34' 00" | 39,569 | 781.37 | Seed/mud line on northwest concrete face of box culvert, 4.10 ft below top of culvert headwall, on north side of SR 568, 50 ft east of 16314 mailbox. |
| RB38 | Right | Good | 41° 02' 10" | -83° 34' 00" | 39,569 | 785.18 | Seed/mud line on northwest concrete face of box culvert, 0.28 ft below top of culvert headwall, on north side of SR 568, 50 ft east of 16314 mailbox. |
| RB39 | Right | Good | 41° 02' 11" | -83° 34' 00" | 39,569 | 785.43 | Mud line on orange right-of-way boundary marker, 1.26 ft below top, on north side of north end of concrete headwall. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank' | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------|-------------------------|-------------|--------------|---|------------------------|---|
| 137 | Left | Good | 41° 02' 03" | -83° 33' 58" | 39,747 | 786.49 | Seed line on left side sliding-door frame, 1.79 ft above concrete block, on back of red barn. |
| 138 | Left | Excellent | 41° 02' 03" | -83° 33' 58" | 39,747 | 786.57 | Seed line on right side of open doorframe, 2.35 ft above ground, on front of red barn. |
| 136 | Left | Fair | 41° 02' 00" | -83° 33' 51" | 40,316 | 786.56 | Mud line on north side signpost, 1.18 ft above ground, on Meadow Trail. |
| Plum Creek near Columbus Grove, Ohio (distances referenced to a point 205 ft downstream of Township Road II) | | | | | | | |
| RB11 | Right | Good | 40° 55' 45" | -84° 04' 19" | 227 | 754.63 | Seed/mud line on telephone pole, on upstream right bank from Road II bridge, 20 ft northeast on northernmost guardrail. |
| LB10 | Left | Excellent | 40° 55' 42" | -84° 04' 10" | 1,111 | 755.70 | Seed line on 1.2-ft-diameter tree, 5.4 ft above ground, in far rear vacant lot, between 803 and 804 Sunny Day Dr. |
| LB09 | Left | Good | 40° 55' 41" | -84° 04' 07" | 1,535 | 756.23 | Seed/mud line on northwest corner of small gray wooden shed, 2.04 ft above concrete block, at far northwest corner of 302 Linwood Dr. property. |
| LB08 | Left | Fair | 40° 55' 36" | -84° 03' 56" | 3,212 | 757.58 | Debris line on 6-in.-diameter tree with large thorns, 4.2 ft above ground, behind vacant lot, between 204 & 205 Briarwood Ct. |
| LB07 | Left | Fair | 40° 55' 35" | -84° 03' 53" | 3,519 | 758.09 | Debris line on small tree, 3.28 ft above ground, 12 ft northwest of bird feeder, 4 ft northwest of white bench, behind 211 Timber Creek Ct. |
| RB12 | Right | Good | 40° 55' 32" | -84° 03' 48" | 4,099 | 761.31 | Seed line on 10th post north of southwest corner of chain-link fence, 2.02 ft below bottom of barbed wire, near southwest corner of Sewage Treatment Plant. |
| LB06 | Left | Good | 40° 55' 30" | -84° 03' 50" | 4,099 | 759.05 | Debris line on 8-in.-diameter tree with three trunks, just east of mulch bed, in tiger lily bed, behind 227 Willow Bend Dr. |
| LB05 | Left | Good | 40° 55' 25" | -84° 03' 46" | 4,642 | 760.40 | Observed mark at seam in concrete drive, south side of central drive, 4.8 ft east of mulch bed, at 526 Wayne St. |
| LB04 | Left | Fair | 40° 55' 24" | -84° 03' 42" | 5,024 | 759.95 | Observed mark at ground level, northwest of corner of yard, just southwest of northernmost fencepost of split rail fence, behind 509 Wayne St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RB13 | Right | Fair | 40° 55' 22" | -84° 03' 40" | 5,319 | 760.61 | Mud/debris line on the third of a group six pine trees, 2.8 ft above ground along the channel bank, behind lot of Indian Trail landscape. |
| RB03 | Right | Excellent | 40° 55' 17" | -84° 03' 34" | 5,958 | 761.51 | Mud line on southeast corner of southmost greenhouse, 1.61 ft above bottom of corner molding, at Indian Trail landscape, just west of SR 65. |
| LB02 | Left | Excellent | 40° 55' 16" | -84° 03' 36" | 6,129 | 761.38 | Mud line on northeast corner of garage, 0.34 ft above bottom of corner molding, north face of molding, across street from 314 W. Sycamore St. |
| LB01 | Left | Good | 40° 55' 13" | -84° 03' 37" | 6,446 | 762.35 | Mud line on garage overhead door frame, 1.84 ft above concrete slab, northwest corner of garage, at 314 W. Sycamore St. |
| LB14 | Left | Good | 40° 55' 12" | -84° 03' 38" | 6,630 | 762.60 | Mud line on metal frame to sliding door, 0.76 ft above concrete, southwest corner of sunroom, south side of 104 Glancy St. |
| RB27 | Right | Good | 40° 55' 10" | -84° 03' 40" | 6,831 | 762.72 | Seed line on tree, about 6 ft west of west edge of driveway, in line with center of large two-car garage overhead door, at 111 West St. |
| LB15 | Left | Good | 40° 55' 10" | -84° 03' 41" | 6,909 | 763.13 | Seed line on downstream low steel, 0.08 ft above low steel, 0.97 ft below side walk, of West St. bridge. |
| RB16 | Right | Excellent | 40° 55' 09" | -84° 03' 40" | 6,980 | 763.09 | Seed line on north side of house, 1.19 ft above bottom of siding, behind large bushes, 5.5 ft from northwest corner of house, at 110 West St. |
| LB17 | Left | Good | 40° 55' 04" | -84° 03' 45" | 7,611 | 763.25 | Observed mark in center of road, 20 ft south of mailbox #203, at 203 Alna Dr. |
| LB18 | Left | Excellent | 40° 54' 59" | -84° 03' 50" | 8,173 | 763.72 | Seed line on southwest corner of shed, 2.13 ft above bottom of corner molding, shed behind dog kennel, behind 500 Pine St. |
| RB19 | Right | Excellent | 40° 54' 55" | -84° 03' 49" | 8,675 | 763.93 | Seed line on downstream right abutment, 0.54 ft below top of abutment, of Delphos Rd. bridge. |
| LB20 | Left | Excellent | 40° 54' 50" | -84° 03' 54" | 9,404 | 764.87 | Seed line on metal siding, 0.74 ft above bottom of corner molding, south face of southeast corner of white metal shed, behind 308 Deiphos Rd. |
| RB26 | Right | Fair | 40° 54' 48" | -84° 03' 52" | 9,475 | 765.14 | Seed line on 5-in.-diameter thorny tree on channel bank, northwest of northwest corner of house at 707 Veterans Dr. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

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| HWM ID | Bank' | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--|-------|-------------------------|-------------|--------------|---|------------------------|---|
| LB21 | Left | Poor | 40° 54' 48" | -84° 04' 02" | 10,395 | 767.75 | Observed mark in grass, 54 ft southeast of telephone/light pole, 66 ft southwest of neighbor's split-rail fence, in line with and 120 ft southeast of southeast corner of house, behind 10735 Delphos Rd. |
| RB24 | Right | Poor | 40° 54' 36" | -84° 04' 20" | 12,414 | 768.21 | Seed/debris line on a 1.2-ft-diameter dead stag tree, 4.4 ft above ground, at top of right bank, 90 ft northeast of tree stand. |
| LB23 | Left | Poor | 40° 54' 36" | -84° 04' 26" | 12,856 | 768.18 | Mud line on 2 ft by 4 ft wooden sign post, 0.97 ft below top of sign, northeast post. |
| RB25 | Right | Fair | 40° 54' 30" | -84° 04' 31" | 13,635 | 768.95 | Seed line on southeast side of a 1.0-ft-diameter tree, about 25 ft northwest of a cluster of three pine trees. |
| RB22 | Right | Fair | 40° 54' 25" | -84° 04' 41" | 15,078 | 769.69 | Seed line on downstream wooden guardrail support post, southeastmost wooden post, of Road IIR bridge. |
| Blanchard River near Ottawa, Ohio (distances referenced to a point 150 ft downstream of Township Road I-9/Blanchard Avenue) | | | | | | | |
| LB17 | Left | Fair | 41° 01' 49" | -84° 04' 08" | 313 | 727.30 | Mud/debris line on left bank, near 1-in.-diameter ash and 2-in. diameter apple trees, 5 ft from mowed grass edge, about 80 ft upstream from Blanchard Rd. bridge. |
| RB14 | Right | Poor | 41° 01' 50" | -84° 04' 07" | 313 | 727.29 | Mud/debris line on right bank, 10 ft upstream from road edge, 15 ft landward from abutment of Blanchard Rd. bridge. |
| RB13 | Right | Fair | 41° 02' 05" | -84° 03' 48" | 1,595 | 728.03 | Seed line on tree, 6.7 ft above ground, about 50 ft streamward from edge of road, at bend in Blanchard Rd. |
| RB12 | Right | Fair | 41° 01' 52" | -84° 03' 21" | 3,576 | 728.59 | Seed line on tree, 6.5 ft above ground, behind STP, between river and chain link fence, about 45 ft downstream of second yellow well casing, at back edge of property. |
| RB11 | Right | Fair | 41° 01' 43" | -84° 02' 58" | 5,057 | 728.25 | Seed line on tree, 6.3 ft above ground, behind Ohio Farmer's Union, between stream and parking lot. |
| LB15 | Left | Fair | 41° 01' 23" | -84° 03' 38" | 5,057 | 728.70 | Mud/debris on northeast corner post of chain-link fence around transmission tower, 2.95 ft above ground, behind Stonehenge Apartment complex on Riverview Dr. |
| LB16 | Left | Fair | 41° 01' 33" | -84° 03' 24" | NA ³ | NA ³ | Mud line on multistemmed mulberry tree, 5.6 ft above ground, 10 ft from field edge, about 1,200 ft northeast of LB15. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

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| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB10 | Right | Fair | 41° 01' 32" | -84° 02' 58" | 6,292 | 728.51 | Seed line on tree, 4.5 ft above ground, about 50 ft streamward from McDonald's parking lot (near dumpster). |
| LB14 | Left | Fair | 41° 01' 13" | -84° 03' 38" | 7,687 | 728.77 | Mud/debris line of 3-in.-diameter sugar maple, 5.85 ft above ground, about 30 ft from river, 20 ft behind log pile, on yard edge for 210 Ottawa-Glandorf Rd. |
| RB09 | Right | Good | 41° 01' 13" | -84° 03' 14" | 7,687 | 727.06 | Mud line on left side garage door of white garage by road, 3.7 ft above ground, at 172 Third St., upstream side of garage. |
| LB13 | Left | Good | 41° 01' 10" | -84° 03' 28" | 7,982 | 728.88 | Mud line on yellow fiberglass wall panel, 3.7 ft above ground, on back (north side) of abandoned shop building, north side of SR 224, west of bridge over Blanchard. |
| LB12 | Left | Fair | 41° 01' 07" | -84° 03' 27" | 8,296 | 726.93 | Mud line on 12-in.-diameter hackberry tree, 5.1 ft above ground, about 100 ft upstream from SR 224 bridge, at edge of Sts. Peter & Paul Cemetery, 5 ft down slope from mowed lawn. |
| LB11 | Left | Fair | 41° 01' 02" | -84° 03' 23" | 8,884 | 728.90 | Mud line on 6-in.-diameter elm tree, 2.8 ft above ground, at far northeast corner of Sts. Peter & Paul Cemetery, near edge of dropoff, about 100 ft north of "Lanniers" grave. |
| LB09 | Left | Fair | 41° 00' 53" | -84° 03' 15" | 9,769 | 729.20 | Mud line on base of 12-in.-diameter elm tree, 1.0 ft above ground, 10 ft beyond concrete piles behind westernmost storage building along river. |
| LB10 | Left | Good | 41° 00' 54" | -84° 03' 05" | 10,320 | 729.21 | Mud line on black air conditioner unit, about 5 ft above ground, 1.1 ft above concrete base, at northeast corner of 406 Blanchard St. |
| RB08 | Right | Good | 41° 01' 04" | -84° 03' 02" | 10,320 | 729.19 | Mud line on downstream side of white garage by window, about 5.5 ft above ground, first house downstream from bridge, at 315 Second St. |
| LB08 | Left | Fair | 41° 00' 57" | -84° 02' 59" | 10,704 | 728.32 | Debris line on 5-in.-diameter boxelder, 5.25 ft above ground, about 80 ft into woods from edge of mowed highway embankment, on east side of SR 65. |
| LB07 | Left | Fair | 41° 00' 59" | -84° 02' 49" | 11,418 | 727.71 | Mud line on rock, about 8 ft from southeast end of bridge rail. |
| RB07A | Right | Good | 41° 01' 02" | -84° 02' 45" | NA ³ | NA ³ | Mud line on green vertical steel rack, 2.1 ft above ground, 15 ft from staff gage behind county garage building B, on E. Second St., east of S. Oak St. |
| RB07B | Right | Good | 41° 01' 03" | -84° 02' 43" | 11,822 | 730.28 | Mud line on right side of east door entrance frame, 1.55 ft above ground, at building B of county garage on E. Second St., east of S. Oak St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RB06 | Right | Good | 41° 01' 03" | -84° 02' 34" | 12,252 | 729.77 | Mud line on door of white shed, 6.1 ft above ground, northwest corner, behind new gray house (no address) on E. Second St., near S. Cox St. |
| LB06 | Left | Fair | 41° 00' 37" | -84° 02' 34" | 13,242 | 730.28 | Debris line on 6-in.-diameter hackberry tree, 2.1 ft above ground, 20 ft from stream on steep bank, about 60 ft from road, west of Sugar Mill Dr. and E. Williamstown Rd. intersection. |
| RB05 | Right | Good | 41° 00' 56" | -84° 02' 21" | 13,881 | 730.26 | Mud line on doorstop inside garage at 375 S. Thomas St. |
| LB05 | Left | Good | 41° 00' 31" | -84° 02' 12" | 14,755 | 730.68 | Mud line on signpost, 2.7 ft above ground, "Steel Technologies" receiving signpost, near road. |
| RB04 | Right | Fair | 41° 01' 01" | -84° 02' 05" | 15,484 | 730.29 | Seed line in tree, 5.5 ft above ground, 75 ft upstream from railroad bridge. |
| RB03 | Right | Poor | 41° 00' 53" | -84° 01' 34" | 17,353 | 731.01 | Seed line in tree, 3 ft above ground, behind fairgrounds, 100 ft downstream of end of Gate 1 drive. |
| LB04 | Left | Fair | 41° 00' 29" | -84° 01' 52" | 17,553 | 730.45 | Debris on 8-in.-diameter locust tree, 4.0 ft above ground, at northwest corner of grove, about 70 ft from gravel access drive, 10 ft from plowed field, off K-6 Rd. |
| LB03 | Left | Fair | 41° 00' 22" | -84° 01' 27" | 19,075 | 730.72 | Debris line of 3-in.-diameter hackberry tree, 1.0 ft above ground, on top of bank, about 30 ft from stream, about 60 ft from road edge. |
| RB02 | Right | Fair | 41° 00' 41" | -84° 01' 19" | 19,788 | 730.40 | Seed line on tree, 8 ft above ground, just downstream of small box culvert, about 200 ft upstream from small brick building. |
| LB02 | Left | Fair | 41° 00' 35" | -84° 01' 12" | 20,021 | 731.45 | Debris line on 4-in.-diameter walnut tree, 3.0 ft above ground, on edge of field, about 180 ft upslope from corner of woods. |
| RB01 | Right | Fair | 41° 00' 46" | -84° 00' 56" | 21,531 | 731.36 | Debris line on ground, about 12 ft downstream from road edge, 10 ft landward from bridge abutment. |
| LB01 | Left | Fair | 41° 00' 43" | -84° 00' 56" | 21,531 | 731.47 | Debris/mud line on ground, 10 ft from guardrail, 30 ft south of utility pole #153213D, near left downstream abutment. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| Rocky Fork Mohican River near Mansfield, Ohio (distances referenced to a point 237 ft downstream of State Route 39 / Lucas Road) | | | | | | | |
| RB32 | Right | Good | 41° 44' 27" | -82° 27' 45" | 271 | 1,127.37 | Seed/mud line, on upstream right abutment, 2.4 ft below low concrete, at SR 39 bridge. |
| RB29 | Right | Poor | 41° 44' 43" | -82° 28' 38" | 5,067 | 1,133.98 | Mud line on V-shaped tree, 0.4 ft above ground, along sludge field service road of Sewage Treatment Plant. |
| LB31 | Left | Fair | 41° 44' 59" | -82° 28' 44" | 6,574 | 1,134.75 | Mud line in poison-ivy-covered beech tree, 0.55 ft above ground, across from mailbox #1039 Hickory Ln., southeast of drive, 7 ft southeast of most southeast fencepost. |
| RB28 | Right | Good | 41° 44' 53" | -82° 28' 56" | 6,850 | 1,135.07 | Mud line on vertical fence post, 2.36 ft below bottom of barbed wire fence bracket, at Sewage Treatment Plant, 5 ft west of bushy, multitrunk tree. |
| LB30 | Left | Fair | 41° 45' 04" | -82° 28' 57" | 7,628 | 1,135.41 | Mud line on 3-ft-diameter oak tree, 0.7 ft above ground, 6 ft west of west edge of drive, halfway between edge of drive and house, at 932 Hickory Ln. |
| LB26 | Left | Excellent | 41° 45' 04" | -82° 29' 03" | 8,057 | 1,136.36 | Mud line on downstream left abutment, 0.6 ft lower than top of concrete, 4.5 ft north of edge of abutment, at Illinois Ave. bridge. |
| LB27 | Left | Excellent | 41° 45' 04" | -82° 29' 04" | 8,104 | 1,136.56 | Mud line on upstream left wing wall, 0.36 ft below top of wing wall, northwest corner of wing wall, at Illinois Ave. bridge. |
| RB22 | Right | Excellent | 41° 45' 02" | -82° 29' 10" | 8,629 | 1,136.98 | Mud line on left side loading bay #10, 2.35 ft above concrete drive, beside downspout at northwest corner of Smurfit-Stone building. |
| RB21 | Right | Fair | 41° 45' 02" | -82° 29' 16" | 8,966 | 1,137.45 | Mud line on 2-ft-diameter cottonwood tree, 1.5 ft above ground, northwest corner of gravel lot, 60 ft west of west edge of Smurfit-Stone lot on Illinois Ave. |
| LB25 | Left | Excellent | 41° 45' 07" | -82° 29' 23" | 9,672 | 1,138.05 | Mud line on 2.5-ft-diameter cottonwood tree, 4.1 ft above ground, along rear of lot, southeast of white school bus, at Tucker Bros. Auto Wrecking. |
| LB24 | Left | Excellent | 41° 45' 20" | -82° 29' 38" | 11,615 | 1,141.00 | Mud line on fencepost, 3.46 ft above bottom horizontal pipe, 40 ft northeast of easternmost dugout, at St. Peters Spartans ball field. |
| LB23 | Left | Good | 41° 45' 25" | -82° 29' 47" | 12,365 | 1,141.04 | Mud line on west face of blue metal-sided building, 1.52 ft above bottom of siding, southwest corner of building, 5.7 ft north of southernmost garage bay. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route.]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB20 | Right | Good | 41° 45' 25" | -82° 29' 50" | 12,557 | 1,141.09 | Mud line on fourth guardrail post northwest, 1.03 ft above ground, southeast corner of parking lot, east edge of blacktop, at City of Mansfield Maintenance Area. |
| RB19 | Right | Good | 41° 45' 28" | -82° 29' 54" | 12,995 | 1,141.71 | Mud line on a V-shaped locust tree, 1.03 ft above ground, about 50 ft downstream from Park Ave. East bridge. |
| RB18 | Right | Excellent | 41° 45' 36" | -82° 29' 59" | 13,881 | 1,142.71 | Mud line on third fencepost northwest, 2.13 ft below bottom of barbed wire bracket, most southeast corner of fence, at outer fenced area of the National Guard. |
| RB13 | Right | Fair | 41° 45' 42" | -82° 30' 02" | 14,589 | 1,142.72 | Mud line on upstream right wing wall, 2.35 ft below bottom of concrete deck, 0.12 ft above concrete abutment, of SR 42 bridge. |
| LB14 | Left | Excellent | 41° 45' 49" | -82° 30' 08" | 15,307 | 1,143.76 | Mud line on 6-in.-diameter metal pipe, 0.39 ft below top of pipe, between third-baseline bleachers, south of semi trailers, at Tappen ballpark, off Laird Ave. |
| RB12 | Right | Excellent | 41° 45' 44" | -82° 30' 14" | 15,581 | 1,143.81 | Mud line on right door frame, 1.8 ft above concrete, far east side of glass front doors, at 320 E. Fifth St. (SR 39), Smoke Less America. |
| LB15 | Left | Excellent | 41° 45' 49" | -82° 30' 13" | 15,654 | 1,143.82 | Mud line on east face of galvanized steel siding, 0.58 ft above top of steel threshold, near southeast corner of building, just south of Laird Ave. |
| LB16 | Left | Excellent | 41° 45' 50" | -82° 30' 18" | 16,100 | 1,144.29 | Mud line on concrete porch, 1.1 ft below top of concrete step by red walkthrough door, near southeast corner of red brick building, at 200 Wayne St. |
| RB11 | Right | Good | 41° 45' 50" | -82° 30' 23" | 16,373 | 1,144.78 | Seed/mud line on northeast face of concrete drop box on sewer box, near downstream right abutment of Wayne St. bridge. |
| RB09 | Right | Good | 41° 45' 52" | -82° 30' 29" | 16,949 | 1,145.87 | Seed line on downstream right abutment, 1.99 ft above low concrete, 2.33 ft below top of concrete bridge rail, at Newman St. bridge. |
| LB17 | Left | Fair | 41° 45' 54" | -82° 30' 28" | 16,949 | 1,145.26 | Mud line on foundation stone, 1.68 ft above ground, in rear of white concrete-block auto-repair building, at 250 Newman St. |
| RB10 | Right | Excellent | 41° 45' 52" | -82° 30' 30" | 17,031 | 1,146.17 | Seed/mud line on white metal building, 1.33 ft above bottom of siding, northeast corner, southeast of Schneider's Bakery. |
| RB07 | Right | Excellent | 41° 45' 55" | -82° 30' 34" | 17,376 | 1,146.16 | Seed line on downstream right wing wall, 1.06 ft above top of concrete footing, 6.11 ft below top of wing wall, 7.5 ft downstream of abutment, at Orange St. bridge. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------|-------------------------|-------------|--------------|---|------------------------|--|
| RB08 | Right | Excellent | 41° 46' 00" | -82° 30' 37" | 17,913 | 1,147.26 | Mud line on most northeast set of concrete steps, 0.61 ft below top of concrete platform, northeast corner of northernmost building of Timber Roots Co., at 143 Orange St. |
| RB06 | Right | Excellent | 41° 46' 04" | -82° 30' 37" | 18,252 | 1,147.41 | Mud line on east side of doorframe, 1.06 ft above bottom of walkthrough door, on southwest corner of building. |
| RB05 | Right | Excellent | 41° 46' 11" | -82° 30' 36" | 18,983 | 1,148.06 | Seed/mud line on concrete block, 0.92 ft above steel flange, on west side of easternmost loading dock at Shellmer Assemblies. |
| RB04 | Right | Fair | 41° 46' 17" | -82° 30' 36" | 19,606 | 1,148.60 | Mud/drift line on wooden support beams, downstream side of old railroad bridge, 20 ft west of concrete abutment, 20 ft downstream from tracks. |
| RB03 | Right | Excellent | 41° 46' 14" | -82° 30' 39" | 19,678 | 1,150.08 | Seed/mud line on southeast corner of beige metal building, 0.47 ft above bottom of corner siding, at C&P Manufacturing Adventure Trailers. |
| RB02 | Right | Excellent | 41° 46' 24" | -82° 30' 46" | 20,679 | 1,149.97 | Mud line on northwest corner of red metal shed, 0.66 ft above concrete floor, near stream at Citation Mansfield lot. |
| LB01 | Left | Excellent | 41° 46' 29" | -82° 30' 49" | 21,364 | 1,150.34 | Mud line on south side of fuel tank #1993, 3.63 ft above steel floor, 2.66 ft below top of tank, in Kokosing lot at 606 Main St. (SR 13). |
| 100 | Right | Good | 41° 46' 28" | -82° 30' 52" | 21,364 | 1,150.30 | Seed line on back of guardrail, 1.99 ft above ground, between second and third post from right abutment, upstream right side of SR 13 bridge. |
| 101 | Left | Excellent | 41° 46' 33" | -82° 30' 52" | 21,830 | 1,150.96 | Seed line on metal siding, 2.52 ft above ground, in alcove on east side of Moritz International, Inc. (trailers) building. |
| 103 | Right | Excellent | 41° 46' 37" | -82° 31' 00" | 22,346 | 1,150.50 | Mud line on inside left wall of entrance, 1.55 ft above ground, at Longview Metal Recycling, Inc., at 57 W. Longview Ave. |
| 102 | Left | Excellent | 41° 46' 37" | -82° 30' 54" | 22,417 | 1,150.46 | Seed line on right garage doorframe, 2.57 ft above ground, south side of D&S Distribution. |
| 104 | Right | Good | 41° 46' 39" | -82° 31' 02" | 22,627 | 1,150.56 | Mud line on northwest corner roof support, 1.14 ft above ground, on Custom Control Technologies building, at 60 W. Longview Ave. |
| 115 | Left | Excellent | 41° 46' 41" | -82° 30' 51" | 22,751 | 1,150.60 | Mud line on concrete pier, 4.91 ft above ground, on south side of southwest pier of U.S. 30 bridge over southbound SR 13. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| 114 | Left | Excellent | 41° 46' 43" | -82° 30' 51" | 22,962 | 1,150.58 | Mud line on concrete pier, 4.76 ft above ground, on north side of northwest pier of U.S. 30 bridge over southbound SR 13. |
| 105 | Right | Poor | 41° 46' 49" | -82° 31' 09" | 23,875 | 1,150.49 | Mud line on ground, 9.5 ft east of east rail of railroad, about 850 ft upstream from SR 30. |
| 113 | Left | Excellent | 41° 46' 55" | -82° 30' 51" | 23,984 | 1,150.69 | Mud line on concrete wall, 1.37 ft above ground, east side of north steps to Empire Affiliates (credit union). |
| 112 | Left | Excellent | 41° 46' 56" | -82° 30' 57" | 24,199 | 1,150.75 | Mud line on white handrail for steps, 3.1 ft above ground, of a playset at south end of ballpark. |
| 106 | Right | Poor | 41° 46' 56" | -82° 31' 12" | 24,613 | 1,150.75 | Mud line on north side of tree, 0.5 ft above rail, east side of railroad tracks. |
| 111 | Left | Excellent | 41° 47' 00" | -82° 30' 59" | 24,749 | 1,150.80 | Seed line on metal siding, 4.03 ft above ground, on northwest corner of white metal shed at ballpark. |
| 107 | Right | Good | 41° 47' 07" | -82° 31' 16" | 25,724 | 1,150.98 | Seed line on siding, 1.24 ft above ground, on north side of tan shed at Mansfield Railway, north of control tower. |
| 108 | Right | Poor | 41° 47' 16" | -82° 31' 21" | 26,700 | 1,151.38 | Seed line on west side of large maple tree, 4.1 ft above ground. |
| 109 | Right | Fair | 41° 47' 22" | -82° 31' 24" | 27,378 | 1,151.81 | Oil line on culvert headwall, 1.18 ft from top, north side of east end of culvert. |
| 110 | Right | Fair | 41° 47' 35" | -82° 31' 32" | 28,858 | 1,154.27 | Mud line on south side of telephone pole, 1.9 ft above ground, south of AK Steel access road. |
| 122 | Left | Good | 41° 47' 39" | -82° 31' 50" | 30,568 | 1,157.84 | Mud line on east side of old brown booth, 2.9 ft above ground, in middle of scrub field. |
| 121 | Left | Excellent | 41° 47' 46" | -82° 31' 54" | 31,462 | 1,158.43 | Mud line at southeast corner of brown block building, 1 ft above ground, at Safe Guard gravel plant. |
| 119 | Left | Excellent | 41° 47' 49" | -82° 31' 58" | 32,127 | 1,158.71 | Mud line on right windowframe, 0.80 ft above windowsill, of north window of Ormnsource on Bowman Rd. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| 120 | Left | Poor | 41° 47' 49" | -82° 32' 07" | 32,453 | 1,158.88 | Seed line on northern side of tree, 4.5 ft above ground, on upstream left bank of railroad bridge. |
| 118 | Left | Good | 41° 47' 56" | -82° 32' 14" | 33,471 | 1,159.66 | Mud line on western side of black and yellow caution sign 3.34 ft above ground, for Wilging Rd bridge. |
| 116 | Left | Fair | 41° 48' 00" | -82° 32' 18" | 34,082 | 1,160.49 | Mud line on board nailed to tree, 5 ft above ground, 180 ft downstream from bridge. |
| 117 | Left | Fair | 41° 48' 01" | -82° 32' 22" | 34,434 | 1,161.09 | Seed line on southwestern side of tree, 5 ft above ground, 180 ft upstream from bridge side. |
| Touby Run near Mansfield, Ohio (distances referenced to mouth at confluence with Rocky Fork Mohican River) | | | | | | | |
| LT01 | Left | Good | 40° 46' 17" | -82° 30' 39" | 148 | 1149.24 | Mud line on 4-in.-diameter tree, 40 ft towards stream from railroad tracks midway between bridge over Rocky Fork and power pole. |
| RM01 | Right | Excellent | 40° 46' 16" | -82° 30' 40" | 289 | 1149.84 | Mud/seed line on overhead-door frame on north side of boat trailer factory, east side of overhead door. |
| RM02 | Right | Excellent | 40° 46' 15" | -82° 30' 42" | 445 | 1150.08 | Seed line on inside north wall next to overhead door entrance to 95 Ohio Brass Rd, Mid Ohio Lumber; overhead door is on west side at northwest corner. |
| RM03 | Right | Fair | 40° 46' 14" | -82° 30' 47" | 896 | 1150.26 | Mud line on 8-in.-diameter tree, 50 ft east of railroad track, 30 ft south of stream, very close to concrete railroad bridge. |
| LT02 | Left | Fair | 40° 46' 14" | -82° 30' 48" | 942 | 1150.01 | Mud line on wing wall, on downstream side of bridge. |
| LT03 | Left | Good | 40° 46' 12" | -82° 30' 50" | 1,201 | 1151.27 | Mud/seed line on 8-in.-diameter tree, next to parking lot, near parking spot #184, 100 ft downstream from building on right bank. |
| RM04 | Right | Excellent | 40° 46' 12" | -82° 30' 50" | 1,201 | 1151.24 | Seed line on 4-in.-diameter tree, 30 ft north of brick warehouse, 15 ft east of stream, Ohio Brass warehouse. |
| RM05 | Right | Excellent | 40° 46' 09" | -82° 30' 50" | 1,459 | 1151.37 | Seed line on overhead-door frame at south entrance to Ohio Brass warehouse, 25 ft north of gazebo and concrete footbridge. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

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| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| LT04 | Left | Good | 40° 46' 08" | -82° 30' 51" | 1,627 | 1151.61 | Mud line on vertical post in parking lot, 0.49 ft below top of pole; pole is directly across sidewalk from black light pole; parking lot is downstream from Brass Office Center. |
| RM06 | Right | Poor | 40° 46' 05" | -82° 30' 51" | 1,870 | 1151.90 | Drift line on ground, 10 ft from stream, 80 ft downstream from bridge, 8 ft upstream from fifth tree from Ohio Brass Office. |
| LT05 | Left | Good | 40° 46' 05" | -82° 30' 52" | 1,948 | 1152.19 | Seed line on downstream side of bridge beam, 0.5 ft above abutment, near left abutment. |
| RM07 | Right | Poor | 40° 46' 04" | -82° 30' 52" | 2,009 | 1152.23 | Drift line at right upstream abutment of N. Diamond St. bridge. |
| LT06 | Left | Poor | 40° 46' 04" | -82° 30' 53" | 2,046 | 1152.45 | Drift line near upstream side of bridge midway between N. Main and SR13, 10 ft downstream on manhole cover |
| RM08 | Right | Excellent | 40° 46' 04" | -82° 30' 54" | 2,096 | 1152.62 | Seed line on downstream concrete parapet span at right abutment on N. Main St. bridge. |
| RM09 | Right | Fair | 40° 46' 04" | -82° 30' 54" | 2,148 | 1152.74 | Seed line on upstream bridge span at right abutment of N. Main St. |
| RM10 | Right | Good | 40° 46' 01" | -82° 30' 55" | 2,403 | 1154.28 | Seed line on inside of railroad guardrail at right downstream side of railroad bridge, just upstream from Main St. |
| RM11 | Right | Good | 40° 46' 01" | -82° 30' 55" | 2,415 | 1154.36 | Mud line on inside of railroad guardrail at right upstream side of railroad bridge, just upstream from Main St. |
| RM12 | Right | Excellent | 40° 46' 01" | -82° 30' 55" | 2,479 | 1154.66 | Seed line on north side of Special Touch Salon, 8 ft from northwest corner of building, at 309 N. Main St. |
| LT07 | Left | Excellent | 40° 46' 01" | -82° 30' 57" | 2,632 | 1155.94 | Mud line on stream side of rusted metal railroad building, 20 ft downstream from tracks; building has a worn "S Main" sign. |
| RM13 | Right | Excellent | 40° 45' 59" | -82° 30' 56" | 2,632 | 1154.16 | Mud line on north-facing entry door to Minnich Manufacturing, at 277 N. Main St. |
| RM14 | Right | Excellent | 40° 45' 56" | -82° 31' 02" | 3,178 | 1158.43 | Mud line on center entry door to Goettl Bros at 254 N. Mulberry St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

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| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| LT08 | Left | Good | 40° 45' 57" | -82° 31' 04" | 3,304 | 1158.67 | Mud line on doorframe, about 0.05 ft above bottom door hinge, of U WASH car wash, next to gas meter. |
| RM15 | Right | Excellent | 40° 45' 55" | -82° 31' 03" | 3,453 | 1159.14 | Seed line on wall just left of entry door to H&H supply, 243 N Mulberry. |
| LT10 | Left | Good | 40° 45' 55" | -82° 31' 06" | 3,562 | 1159.70 | Mud line on downspout of gray building with red and blue stripe, southeast corner of building at 90 W. Sixth St. |
| LT09 | Left | Excellent | 40° 45' 56" | -82° 31' 07" | 3,617 | 1160.16 | Mud line on right side of loading dock, 1.38 ft above concrete, of Metzger Gleisinger company, at 100 W. Sixth St. |
| LT11 | Left | Excellent | 40° 45' 54" | -82° 31' 06" | 3,721 | 1160.24 | Seed line on beige house across W. Sixth St. from gray building; mark is above door to cellar, about even with bottom of windows. |
| LT14 | Left | Fair | 40° 45' 53" | -82° 31' 14" | 4,401 | 1161.57 | Debris line on fence; mark is on corner post of fence, 4 ft from front of building of Rable Machine. |
| LT12 | Left | Excellent | 40° 45' 52" | -82° 31' 15" | 4,538 | 1162.86 | Mud/seed line on left doorjamb, 2.82 ft above pavement, of large sided door on back of building of Rable Machine. |
| LT13 | Left | Fair | 40° 45' 52" | -82° 31' 15" | 4,560 | 1163.30 | Debris line on fence; mark is on corner post near "shipping and receiving and office" sign of Rable Machine. |
| LT15 | Left | Poor | 40° 46' 00" | -82° 31' 23" | 5,725 | 1170.78 | Seed line on upstream side of bridge, 4.92 ft below parapet, 10 ft from left edge of bridge of Bowman St. |
| RM16 | Right | Excellent | 40° 46' 03" | -82° 31' 30" | 6,336 | 1172.92 | Seed line on concrete-block stairwell just inside two-story overhead door #5 at east-facing wall of Gorman Rupp Manufacturing plant. |
| RM17 | Right | Excellent | 40° 46' 04" | -82° 31' 35" | 6,785 | 1173.51 | Mud line on north wall of Gorman Rupp building, adjacent to Hoffman Box, next to an overhead door, across from a small building with brown entry door. |
| LT17 | Left | Poor | 40° 46' 02" | -82° 31' 43" | 7,724 | 1179.13 | Debris line on fence near corner next to gasoline marker near southeast corner of back building of Gorman Rupp Pump Company. |
| LT16 | Left | Poor | 40° 46' 01" | -82° 31' 50" | 8,466 | 1183.28 | Debris line on fence at Gorman Rupp Pump Company back building, 50 ft upstream from retention basin, third post from slight corner post, in line with west edge of building. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RM18 | Right | Fair | 40° 46' 02" | -82° 32' 15" | 10,486 | 1197.52 | Drift line at top of bank, 6 ft from utility pole, 90 ft upstream from octagonal shelterhouse at western end of lake at North Lake Park. |
| RM19 | Right | Fair | 40° 46' 01" | -82° 32' 24" | 11,168 | 1202.52 | Drift line on top of bank, 100 ft upstream from concrete dam and at small weir in North Lake Park. |
| RT90 | Right | Fair | 40° 45' 54" | -82° 32' 40" | 12,696 | 1215.93 | Seed line on 16-in.-diameter tree stump, about 5 ft above ground, about 100 ft downstream from concrete weir. |
| LT19 | Left | Good | 40° 45' 53" | -82° 32' 42" | 12,843 | 1221.25 | Mud/seed line on 6-in.-diameter tree leaning towards creek, about 40 ft downstream from W. Fourth St. bridge, 50 ft upstream from weir and old gage site. |
| LT20 | Left | Fair | 40° 45' 49" | -82° 32' 49" | 13,502 | 1227.29 | Seed line on 6-in.-diameter tree, 50 ft downstream from footbridge in woods. |
| RM20 | Right | Poor | 40° 45' 47" | -82° 32' 55" | 14,093 | 1231.69 | Drift/wash line, 80 ft downstream from bike-trail bridge, just below fence to Kingwood Estate. |
| LT21 | Left | Good | 40° 45' 48" | -82° 32' 56" | 14,250 | 1236.22 | Seed line on 10-in.-diameter tree, 70 ft upstream from bikepath bridge. |
| LT22 | Left | Excellent | 40° 45' 44" | -82° 33' 06" | 15,174 | 1242.87 | Seed line on stream side of left bridge pier, about 1 ft above ground, under Trimble Rd. |
| LT23 | Left | Poor | 40° 45' 35" | -82° 33' 22" | 16,807 | 1257.03 | Debris line on ground, 40 ft downstream from SR 430 bridge, 10 ft toward stream from manhole. |
| LT24 | Left | Fair | 40° 45' 21" | -82° 33' 31" | 18,387 | 1269.15 | Seed line on 6-in.-diameter tree, next to creek, 50 ft upstream from basketball court at Park Avenue West Apartment complex. |
| RT91 | Right | Fair | 40° 45' 17" | -82° 33' 50" | 20,535 | 1283.46 | Seed line on 12-in.-diameter leaning tree, 10 ft from gasoline marker, about 18 in. above ground, 15 ft upstream from driveway bridge, at 137 Alpine Dr. |
| LT25 | Left | Excellent | 40° 45' 18" | -82° 33' 50" | 20,535 | 1283.29 | Seed line on back of white barrel on stream side of driveway of 172 Alpine Dr. |
| RM23 | Right | Fair | 40° 45' 18" | -82° 33' 53" | 20,801 | 1283.40 | Mud line on base of tree, 50 ft upstream from driveway bridge to 172 Brookwood Way S. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|---|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RM24 | Right | Excellent | 40° 45' 28" | -82° 34' 02" | 22,464 | 1,299.29 | Mud line on streamward side of garden shed behind the house at 1426 Hardin Ave. |
| LM92 | Left | Poor | 40° 45' 30" | -82° 34' 06" | 22,965 | 1,304.02 | Debris line on ground, directly across Toutby Run from RM22. |
| RM22 | Right | Poor | 40° 45' 30" | -82° 34' 07" | 22,965 | 1,303.23 | Debris line on ground, 75 ft below downstream end of culvert under car dealership at Home Rd. and SR 430. |
| LM91 | Left | Excellent | 40° 45' 36" | -82° 34' 15" | 23,839 | 1,327.58 | Fine debris line on south-facing stone wall on building across from pizza parlor. |
| RM21 | Right | Excellent | 40° 45' 36" | -82° 34' 17" | 23,941 | 1,327.57 | Seed line on north wall of East of Chicago Pizza Co. on SR 430 and Home Rd. |
| LM90 | Left | Excellent | 40° 45' 39" | -82° 34' 19" | 24,323 | 1,327.57 | Seed line on utility pole 86EC2B-70, located behind 309 N. Home Rd. |
| Black Fork Mohican River near Shelby, Ohio (distances referenced to a point 128 ft downstream of London West Road) | | | | | | | |
| LS01 | Left | Good | 40° 54' 29" | -82° 39' 27" | 258 | 1,069.55 | Mud line on 3-in.-diameter tree, between house trailers 8 and 9, upstream side of tree. |
| RS01 | Right | Excellent | 40° 54' 28" | -82° 39' 16" | 359 | 1,070.24 | Seed line on utility pole 2A14 opposite red barn on Broadway St. just south of London West Rd. |
| LS02 | Left | Excellent | 40° 54' 25" | -82° 39' 26" | 700 | 1,071.09 | Seed line on vertical concrete slab, about 50 ft from creek, behind Shelby Welded Tube building. |
| RS02 | Right | Fair | 40° 54' 22" | -82° 39' 19" | 954 | 1,071.51 | Mud line on base of tree adjacent to abandoned shed about 100 yd south of RS01. |
| RS03 | Right | Fair | 40° 54' 15" | -82° 39' 19" | 1,566 | 1,072.28 | Mud line on base of tree about 150 ft north of driveway to private residence. |
| RS04 | Right | Fair | 40° 54' 11" | -82° 39' 23" | 2,048 | 1,072.58 | Drift line on 20-in.-diameter black cherry tree on flood plain behind 5425 Broadway St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| LS04 | Left | Good | 40° 54' 13" | -82° 39' 31" | 2,632 | 1,072.32 | Mud line on railroad tie, 5 ft below tracks on downstream side of railroad tracks. |
| LS03 | Left | Excellent | 40° 54' 13" | -82° 39' 33" | 2,747 | 1,074.28 | Mud/seed line on gutter downspout and telephone network interface box on downstream side of Beer's Lawn and Garden shop. |
| LS05 | Left | Excellent | 40° 54' 03" | -82° 39' 33" | 3,113 | 1,075.08 | Mud line on end of last gravel bin partition at Moritz Concrete, behind building. |
| LS06 | Left | Excellent | 40° 53' 54" | -82° 39' 35" | 3,926 | 1,076.51 | Seed line on maple tree, in clump of trees, downstream from railroad tracks, 500 ft from road along tracks. |
| LS07 | Left | Excellent | 40° 53' 48" | -82° 39' 38" | 4,413 | 1,077.25 | Mud line on column for Sportman's Den, rightmost column, left of new addition, on upstream side of column. |
| RS05 | Right | Fair | 40° 53' 48" | -82° 39' 27" | 4,684 | 1,077.28 | Seed line on utility pole 767 at right downstream side of State St. bridge. |
| RS06 | Right | Excellent | 40° 53' 46" | -82° 39' 29" | 4,951 | 1,077.91 | Mud line on guardrail support of bridge, right upstream third vertical support. |
| LS08 | Left | Excellent | 40° 53' 39" | -82° 39' 45" | 5,889 | 1,079.48 | Seed line on telephone pole ID445, behind The Moody Senior Community Building. |
| LS09 | Left | Excellent | 40° 53' 31" | -82° 39' 40" | 6,598 | 1,079.86 | Mud line on lightpole of ball diamond, first-base line near home plate. |
| LS10 | Left | Excellent | 40° 53' 31" | -82° 39' 40" | 6,598 | 1,079.86 | Mud line on cut-off pole near LS09. |
| LS12 | Left | Excellent | 40° 53' 31" | -82° 39' 39" | 6,598 | 1,079.86 | Mud line on small building behind home plate, upstream side of building. |
| LS11 | Left | Excellent | 40° 53' 31" | -82° 39' 40" | 6,598 | NA ³ | Mud line on lightpole of ball diamond, on third-base line near home plate. |
| RS07 | Right | Good | 40° 53' 11" | -82° 39' 32" | 8,723 | 1,084.99 | Seed line on utility pole at overhead door at factory across from Glens Surplus Sales at corner of E. Smiley Ave. and Mohican St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------|-------------------------|-------------|--------------|---|------------------------|---|
| LS13 | Left | Excellent | 40° 53' 09" | -82° 39' 37" | 8,963 | 1,084.96 | Mud line on blue siding of first-base dugout, on north side, center of block portion of building. |
| RS08 | Right | Excellent | 40° 53' 08" | -82° 39' 31" | 8,963 | 1,085.00 | Mud line on downstream north wall in ramp entry to Glens Surplus Sales, 3 ft from entrance. |
| RS09 | Right | Excellent | 40° 53' 03" | -82° 39' 33" | 9,541 | 1,085.17 | Mud line at entrance to B&B Amish Furniture, south of Glens Surplus Sales, on Mohican St. |
| RS10 | Right | Excellent | 40° 53' 00" | -82° 39' 35" | 9,854 | 1,085.33 | Mud/seed line on southwest corner of United Steel Workers Union Hall building on Mohican St. |
| LS14 | Left | Poor | 40° 52' 59" | -82° 39' 37" | 9,932 | 1,085.43 | Seed line on downstream side of corner fencepost behind 15 West Whitney Ave. |
| RS11 | Right | Excellent | 40° 52' 58" | -82° 39' 34" | 10,054 | 1,085.61 | Seed/mud line on west side of building, 50 ft from road, at 11 E. Whitney Ave. |
| RS12 | Right | Excellent | 40° 52' 58" | -82° 39' 33" | 10,054 | 1,085.64 | Mud line on northwest corner of Kuttan Korner building, at 13 E. Whitney Ave. |
| LS15 | Left | Excellent | 40° 52' 56" | -82° 39' 35" | 10,264 | 1,086.04 | Mud line on corner of garage near gutter downspout of Calvary Baptist Church. |
| RS13 | Right | Excellent | 40° 52' 54" | -82° 39' 33" | 10,487 | 1,086.32 | Mud line on window, 0.78 ft from bottom of glass, at 6 Mohican St. near intersection of Mohican St. and E. Main St. |
| RS14 | Right | Excellent | 40° 52' 52" | -82° 39' 33" | 10,691 | 1,087.51 | Mud line on west window of fire station. |
| LS16 | Left | Excellent | 40° 52' 51" | -82° 39' 38" | 10,691 | 1,088.56 | Seed/mud line on back door of Brittr's Crafts Occasions store. |
| LS17 | Left | Excellent | 40° 52' 46" | -82° 39' 41" | 11,604 | 1,088.72 | Seed/mud line on northeast corner of Shelby school building on west side of football stadium, left side of door. |
| RS16 | Right | Excellent | 40° 52' 43" | -82° 39' 34" | 11,604 | 1,088.69 | Seed line on south-facing red overhead door and doorframe on northernmost school building. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RS15 | Right | Excellent | 40° 52' 43" | -82° 39' 34" | 11,613 | 1,088.65 | Mud line on west-facing double door on school building. |
| RS17 | Right | Excellent | 40° 52' 43" | -82° 39' 35" | 11,663 | 1,088.68 | Mud line on west-facing door at southernmost school building, overlooking south end zone. |
| RS18 | Right | Good | 40° 52' 42" | -82° 39' 36" | 11,778 | 1,088.62 | Seed line on vertical upright upstream side of bridge on footbridge by flag pole, eighth vertical upright from right bank. |
| RS19 | Right | Excellent | 40° 52' 37" | -82° 39' 35" | 12,215 | 1,088.79 | Seed line on north side of detached garage below window behind 34 Park Ave. |
| LS18 | Left | Excellent | 40° 52' 37" | -82° 39' 41" | 12,215 | 1,088.80 | Mud line on northeast corner of Tucker Car Wash on Tucker Ave. |
| RS20 | Right | Good | 40° 52' 32" | -82° 39' 36" | 12,683 | 1,089.30 | Seed line on base of tree on crest of hill behind white picket fence behind 50 Park Ave. |
| LS19 | Left | Excellent | 40° 52' 31" | -82° 39' 44" | 12,964 | 1,089.16 | Seed line on southeast white PVC post of small compost structure at 83 S. Gamble St. |
| RS21 | Right | Excellent | 40° 52' 29" | -82° 39' 36" | 12,964 | 1,089.45 | Seed line on northeast corner of storage shed behind 60 Park Ave. |
| RS22 | Right | Excellent | 40° 52' 26" | -82° 39' 35" | 13,411 | 1,089.45 | Seed line on north side of parking shed, second pole from back wall at 70 Park Ave. |
| LS20 | Left | Excellent | 40° 52' 25" | -82° 39' 45" | 13,411 | 1,089.52 | Seed line on back of red shed behind house at 107 S. Gamble St. |
| RS23 | Right | Good | 40° 52' 22" | -82° 39' 39" | 13,823 | 1,089.93 | Debris line on southwest corner fencepole of chain-link fence of brick municipal building on lane that leads to river from south end of Park Ave. |
| LS21 | Left | Excellent | 40° 52' 17" | -82° 39' 47" | 14,487 | 1,091.85 | Seed line on right side of glass window of green door on downstream side of First Baptist Church. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier, NAVD 88, North American Vertical Datum of 1988, ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--|-------------------|-------------------------|-------------|--------------|---|------------------------|---|
| RS24 | Right | Good | 40° 52' 11" | -82° 39' 38" | 14,911 | 1,092.18 | Mud/seed line on base of 3-ft-diameter tree, 300 ft downstream from upland reservoir parking lot. |
| LS22 | Left | Good | 40° 52' 03" | -82° 39' 44" | 15,845 | 1,093.28 | Seed line on 10-in.-diameter tree, 80 ft from stream channel, 50 ft upstream from Mickey Rd. |
| RS25 | Right | Good | 40° 52' 03" | -82° 39' 40" | 15,845 | 1,093.55 | Seed/mud line on 18-in.-diameter tree, 150 ft south of Mickey Rd. |
| Spring Run near Carey, Ohio (distances referenced to a point 51 ft downstream of Township Road 100-A) | | | | | | | |
| RB30 | Right | Good | 40° 57' 11" | -83° 21' 47" | 112 | 806.74 | Seed/debris line on 2-ft-diameter fencepost, 1.9 ft above ground, 3.4 ft below top of post, 18 ft west of southeast corner of fence, near Township Highway 100A bridge. |
| RB29 | Right | Fair | 40° 57' 03" | -83° 22' 05" | 2,201 | 809.60 | Seed/debris line on small bush-like tree, 4.1 ft above ground, next to channel, northwest of mailbox 729, off Township Highway 100B. |
| RB28 | Right | Fair | 40° 57' 04" | -83° 22' 14" | 2,863 | 810.01 | Seed line on white wooden shed, 0.57 ft above bottom of corner molding, southwest corner of red molding, on west face, behind 668 E. Findlay St. |
| RB27 | Right | Poor | 40° 57' 08" | -83° 22' 26" | 3,945 | 811.73 | Mud line on downstream right wing wall, 1.08 ft below top of wing wall, of Ogg St. bridge. |
| LB08 | Left | Fair | 40° 57' 09" | -83° 22' 35" | 4,679 | 814.31 | Seed line on downstream right side of eastern face of low-steel decking of footbridge, 0.58 ft below top of concrete decking, about 8 ft east of Toledo St. bridge. |
| LB07 | Left | Excellent | 40° 57' 10" | -83° 22' 38" | 4,888 | 815.13 | Mud line on northeast corner of wooden shed, 0.45 ft above bottom of corner molding, on east side of 337 E. North St. |
| RB09 | Right | Good | 40° 57' 09" | -83° 22' 41" | 5,142 | 815.53 | Mud line on north face of westernmost post, 0.59 ft above top of green metal base of backyard playset, behind 322 Findlay St. |
| LB06 | Left | Good | 40° 57' 10" | -83° 22' 42" | 5,242 | 815.63 | Seed/mud line on south side of chain-link fence, 2.75 ft below bottom of fencepost cap, 8 ft west of southeast corner, behind 315 E. North St. |
| LB05 | Left | Excellent | 40° 57' 09" | -83° 22' 53" | 6,110 | 821.06 | Seed/mud line on east doorframe, 0.57 ft above stone step, of the Peiffer Accounting Tax building, at 134 E. Findlay St. (SR 103). |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| RB10 | Right | Good | 40° 57' 08" | -83° 22' 51" | 6,110 | 821.70 | Mud line on south side of flagpole, 0.94 ft above blacktop, next to a 2.5-ft-high brick wall, in parking lot of Kiwanis International building. |
| RB11 | Right | Good | 40° 57' 06" | -83° 22' 53" | 6,335 | 822.30 | Seed/mud line on southwest corner of two-car garage with white siding, 0.7 ft above concrete floor, behind Kiwanis International building. |
| LB04 | Left | Excellent | 40° 57' 07" | -83° 22' 55" | 6,368 | 822.27 | Seed/mud line on southeast corner of white wooden shed, 3.94 ft above bottom of corner molding, behind VFW building. |
| LB03 | Left | Good | 40° 57' 07" | -83° 22' 57" | 6,543 | 822.32 | Mud line on east walkthrough door, 3.27 ft above concrete step, north side of Splinters Café & Spirits building, 27 ft west of northeast corner of building, at 117 S. Vance St. |
| RB12 | Right | Fair | 40° 57' 06" | -83° 22' 58" | 6,543 | 822.32 | Mud/debris line on cham-link fence, 2.03 ft above concrete, fourth post west from southeast edge of fence, 117 Vance St. (SR 23), just south of Splinters. |
| LB01 | Left | Good | 40° 57' 07" | -83° 22' 58" | 6,543 | 822.32 | Mud line on vinyl siding of northern door frame, 1.46 ft above concrete step, of Pieracini's Barber Shop, just south of 1981 Historical Flood plaque. |
| LB02 | Left | Excellent | 40° 57' 07" | -83° 22' 59" | 6,658 | 822.39 | Mud line on glass walkthrough doorframe, 1.19 ft above green outdoor carpet, of Baker Apartments, at 114 S. Vance St. |
| RB26 | Right | Excellent | 40° 57' 05" | -83° 23' 05" | 7,143 | 822.51 | Mud line on northeast corner molding of garage overhead-door frame, 3.95 ft above asphalt, west side of house, at 129 W. South St. |
| RB25 | Right | Good | 40° 57' 06" | -83° 23' 09" | 7,472 | 822.92 | Mud line on northeast corner molding of garage door, 1.64 ft above concrete threshold, 3 ft west of northeast corner of garage, east side of house, at 225 W. South St. |
| RB24 | Right | Excellent | 40° 57' 08" | -83° 23' 14" | 7,954 | 823.46 | Mud line on north face, 4.13 ft above bottom of corner molding, northeast corner of wooden shed, behind 130 West St. |
| LB23 | Left | Good | 40° 57' 09" | -83° 23' 17" | 8,166 | 823.71 | Seed/mud line on overhead-door weatherstripping, 2.04 ft above floor, on southwest corner of garage, at 121 S. Lake St. |
| LB22 | Left | Good | 40° 57' 09" | -83° 23' 19" | 8,361 | 823.61 | Mud line on back of brown private fence, 2.05 ft below top of fencepost, behind and below Notre Dame sign, at 120 S. Lake St. |
| LB21 | Left | Good | 40° 57' 09" | -83° 23' 23" | 8,607 | 823.75 | Seed/mud line on wood siding, 2.26 ft above bottom of corner molding, southwest corner of one-car garage, behind 125 S. Munice St. |

Table 3. Elevation of high-water marks for selected locations in communities flooded on August 21–24, 2007.—Continued

[Data collected and compiled by the U.S. Geological Survey, Ohio Water Science Center unless otherwise noted. Abbreviations: HWM ID, high-water-mark identifier; NAVD 88, North American Vertical Datum of 1988; ft, feet; NR, not rated; SR, State Route; U.S., U.S. Route]

| HWM ID | Bank ¹ | HWM Rating ² | Latitude | Longitude | Distance from reference point of river (ft) | Elevation (ft NAVD 88) | Description and location of high-water mark |
|--------|-------------------|-------------------------|-------------|--------------|---|------------------------|--|
| LB17 | Left | Excellent | 40° 57' 10" | -83° 23' 25" | 8,814 | 824.57 | Mud line on siding, 0.83 ft above bottom of siding, just north of downspout, southwest corner of garage, behind 122 Mumice St. |
| RB18 | Right | Excellent | 40° 57' 09" | -83° 23' 27" | 8,955 | 824.59 | Mud line on garage siding, 0.7 ft above bottom of corner molding, just south of downspout, northeast corner of garage, at 512 W. South St. |
| LB16 | Left | Fair | 40° 57' 10" | -83° 23' 31" | 9,271 | 824.76 | Mud line on 7-in.-diameter pine tree, 4.1 ft above ground, along property line between 613 & 609 W. Findlay St. (SR 568). |
| RB19 | Right | Fair | 40° 57' 06" | -83° 23' 39" | 10,117 | 824.88 | Mud line on small ornamental tree, 2.42 ft above ground, in Shrine Park, along north drive, north of northernmost shelter house, 10 ft west of Shrine III. |
| RB20 | Right | Poor | 40° 57' 07" | -83° 23' 47" | 10,752 | 824.52 | Seed/mud line on cham-link fencepost, 3.49 ft above concrete base, westernmost edge of Shrine Park. |
| LB15 | Left | Poor | 40° 56' 58" | -83° 23' 54" | 11,860 | 827.18 | Mud line on fencepost, 6.71 ft below top of fencepost, of green chain-link fence on walkthrough gate towards stream, behind Carey Plant. |
| LB14 | Left | Poor | 40° 56' 52" | -83° 24' 01" | 12,757 | 829.23 | Mud/debris line on most southeast fencepost, 1.71 ft below bottom of fencepost cap of chain-link fence, 30 ft north of north edge of parking lot for Carey Plant. |
| LB13 | Left | Fair | 40° 56' 42" | -83° 24' 35" | 15,486 | 830.63 | Mud line on double-trunk V-shaped tree, 3.1 ft above ground, in line with southeast corner of fence, 50 ft downstream from corner post, 15 ft left of left edge of stream. |

¹Bank is designated right or left by facing downstream.

²A high-water mark rating is subjectively rated by the U.S. Geological Survey personnel locating the mark as outlined in Lumia and others (1986). High-water marks rated as "excellent" are within 0.02 ft of the true high-water mark, "good" are within 0.05 ft, "fair" are within 0.10 ft, and "poor" are greater than 0.10 ft.

³High-water mark was destroyed before it could be surveyed.

Table 4. Peak stages, peak streamflows, and estimated recurrence-interval ranges at selected U.S. Geological Survey streamgage stations near communities in and around the affected flooded area in Ohio, August 21–24, 2007.

| Permanent station number | Stream and place of determination | Drainage area (square miles) | Gage datum (ft) ¹ | Period of record (annual peak flows) | Maximum prior to August 20, 2007 | | | Maximum during August 20–24, 2007 | | Estimated recurrence-interval range ³ (years) | |
|--------------------------|---|------------------------------|------------------------------|--------------------------------------|----------------------------------|------------|------------------------------------|-----------------------------------|------------|--|---------------------------------|
| | | | | | Water year ² | Stage (ft) | Streamflow (cubic feet per second) | Date | Stage (ft) | | Streamflow (ft ³ /s) |
| 03130500 | Touby Run at Mansfield | 5.44 | 1,215.96 ⁴ | 1947–78 1987 | 1987 | 4.45 | 1,030 | August 21 ⁵ | 5.29 | 1,200 | 50–100 |
| 03131500 | Black Fork Mohican River at Loudonville | 349 | 929.16 | 1913 1932–2007 | 1969 | 14.116 | 8,460 | August 22 | 12.37 | 6,690 | Regulated ⁷ |
| 03136500 | Kokosing River at Mount Vernon | 202 | 984.16 | 1954–2007 | 1959 | 18.19 | 38,000 | August 22 | 6.02 | 1,190 | <2 |
| 03219500 | Scioto River near Prospect | 567 | 886.90 ⁸ | 1913 1915–2007 | 1913 | 21.10 | 27,000 | August 25 | 7.34 | 2,590 | <2 |
| 03220000 | Mill Creek near Bellepoint | 178 | 865.14 ⁸ | 1913 1943–2007 | 1997 | 14.45 | 21,800 | August 23 | 4.63 | 1,080 | <2 |
| 03223000 | Olentangy River at Claridon | 157 | 961.72 | 1947–2001 | 1959 | 16.77 | 14,900 | August 22 | 12.43 | N/A ⁹ | N/A ⁹ |
| 03223425 | Wheatstone Creek at Mt Gilead | 37.9 | 1,074.00 | 1997–2007 | 1998 | 13.64 | 5,650 | August 21 | 8.65 | 1,760 | 2–5 ¹⁰ |
| 03266560 | Mad River at West Liberty | 36.6 | 1,078.00 | 1996–2007 | 2005 | 8.85 | 1,690 | August 22 | 5.97 | 633 | <2 ¹⁰ |
| 04186500 | Auglaize River near Fort Jennings | 332 | 713.60 | 1922–1936 1941–2007 | 1992 | 19.76 | 12,800 | August 21 | 12.66 | 3,890 | <2 |
| 04189000 | Blanchard River near Findlay | 346 | 753.76 ⁴ | 1913 1924–1936 1941–2007 | 1913 | 18.50 | 22,000 | August 22 | 18.46 | 14,500 | 100–500 |
| 04189260 | Blanchard River at Ottawa ¹¹ | 628 | 699.00 | 1995–2007 | 1913 | 33.30 | N/A | August 23 | 31.70 | N/A | N/A |
| 04191500 | Auglaize River near Defiance | 2,318 | 659.70 | 1913 1915–2007 | 1913 | 38.80 | 120,000 | August 23 | 23.13 | 38,700 | 5–10 |
| 04192500 | Maumee River near Defiance | 5,545 | 658.56 | 1925–1936 1939–1975 1979–2007 | 1982 | 15.87 | 104,000 | August 23 | 9.92 | 57,900 | 2–5 |
| 04195500 | Portage River at Woodville | 428 | 614.75 | 1913 1929–1935 1940–2007 | 1913 | 17.00 | 17,000 | August 21 | 11.51 | 7,330 | 2–5 |

[ft, feet (above gage datum); ft³/s, cubic feet per second; <, less than; N/A, not available]

Table 4. Peak stages, peak streamflows, and estimated recurrence-interval ranges at selected U.S. Geological Survey streamgage stations near communities in and around the affected flooded area in Ohio, August 21–24, 2007.

| Permanent station number | Stream and place of determination | Drainage area (square miles) | Gage datum (ft) ¹ | Period of record (annual peak flows) | Maximum prior to August 20, 2007 | | | Maximum during August 20–24, 2007 | | | Estimated recurrence-interval range ³ (years) |
|--------------------------|------------------------------------|------------------------------|------------------------------|--|----------------------------------|---------------------|------------------------------------|-----------------------------------|------------|---------------------------------|--|
| | | | | | Water year ² | Stage (ft) | Streamflow (cubic feet per second) | Date | Stage (ft) | Streamflow (ft ³ /s) | |
| 04196000 | Sandusky River near Bueyrus | 88.8 | 955.04 | 1926–1935 1939–1951 1959 1964–1981 1987 1996–2007 | 1959 | 11.90 | 13,500 | August 21 | 12.17 | 15,800 | >500 |
| 04196500 | Sandusky River near Upper Sandusky | 298 | 792.25 | 1922–1936 1938–1981 2001–2007 | 1959 | 15.00 ¹¹ | 10,000 | August 22 | 13.89 | 11,200 | 50–100 |
| 04196800 | Tymochtee Creek at Crawford | 229 | 785.86 | 1961–2007 | 1991 2006 | 9.77 | 6,700 | August 21 | 9.38 | 6,050 | 25–50 |
| 04197100 | Honey Creek at Melmore | 149 | 818 ² | 1961–2007 | 1981 | 11.00 | 4,400 | August 22 | 7.56 | 1,780 | <2 |
| 04197170 | Rock Creek at Tiffin | 34.6 | 740 ² | 1983–2007 | 1998 | 8.96 | 2,640 | August 21 | 7.77 | 1,630 | 2–5 |
| 04198000 | Sandusky River near Fremont | 1,251 | 626.30 ⁸ | 1924–1936 1939–2007 | 1978 | 13.57 | 36,500 | August 23 | 9.01 | 19,400 | 2–5 |
| 04199000 | Huron River at Milan | 371 | 573.26 | 1950–1981 1988–2007 | 1969 | 31.10 | 49,600 | August 20 | 22.70 | 12,700 | 5–10 |
| 04199500 | Vermilion River near Vermilion | 262 | 595.14 | 1950–1981 2001–2007 | 1969 | 17.14 | 40,800 | August 21 | 8.70 | 9,530 | 5–10 |

¹ Streamgage datum is NGVD 1929 unless otherwise noted.

² A water year is a 12-month period from October 1 through September 30 and is designated by the calendar year in which it ends.

³ Based on weighted estimates from Koltun and others (2006).

⁴ Streamgage datum is 1,216.42 ft COE1912; however, for this report it is converted to NAVD 1988.

⁵ Streamgage was discontinued in 1978. The date of the peak streamflow is estimated from other gage data. The stage was determined from high-water marks near the station.

⁶ Highest peak stage of record was 20.50 for the 1913 flood but a peak flow was not determined.

⁷ Flow is regulated from operations at Charles Mill Lake on Black Fork Mohican River beginning in 1937.

⁸ U.S. Army Corps of Engineers 1912.

⁹ Olentangy River at Claridon was converted to a continuous-record annual-peak station in 1998 and a stage-only station in 2001.

¹⁰ Based on frequency estimates from Ohio StreamStats (U.S. Geological Survey, 2008).

¹¹ Blanchard River at Ottawa is a stage only station operated for the National Weather Service, data from the Advanced Hydrologic Prediction Service web page.

¹² Streamgage height affected by backwater.

¹³ Streamgage datum from topographic map.

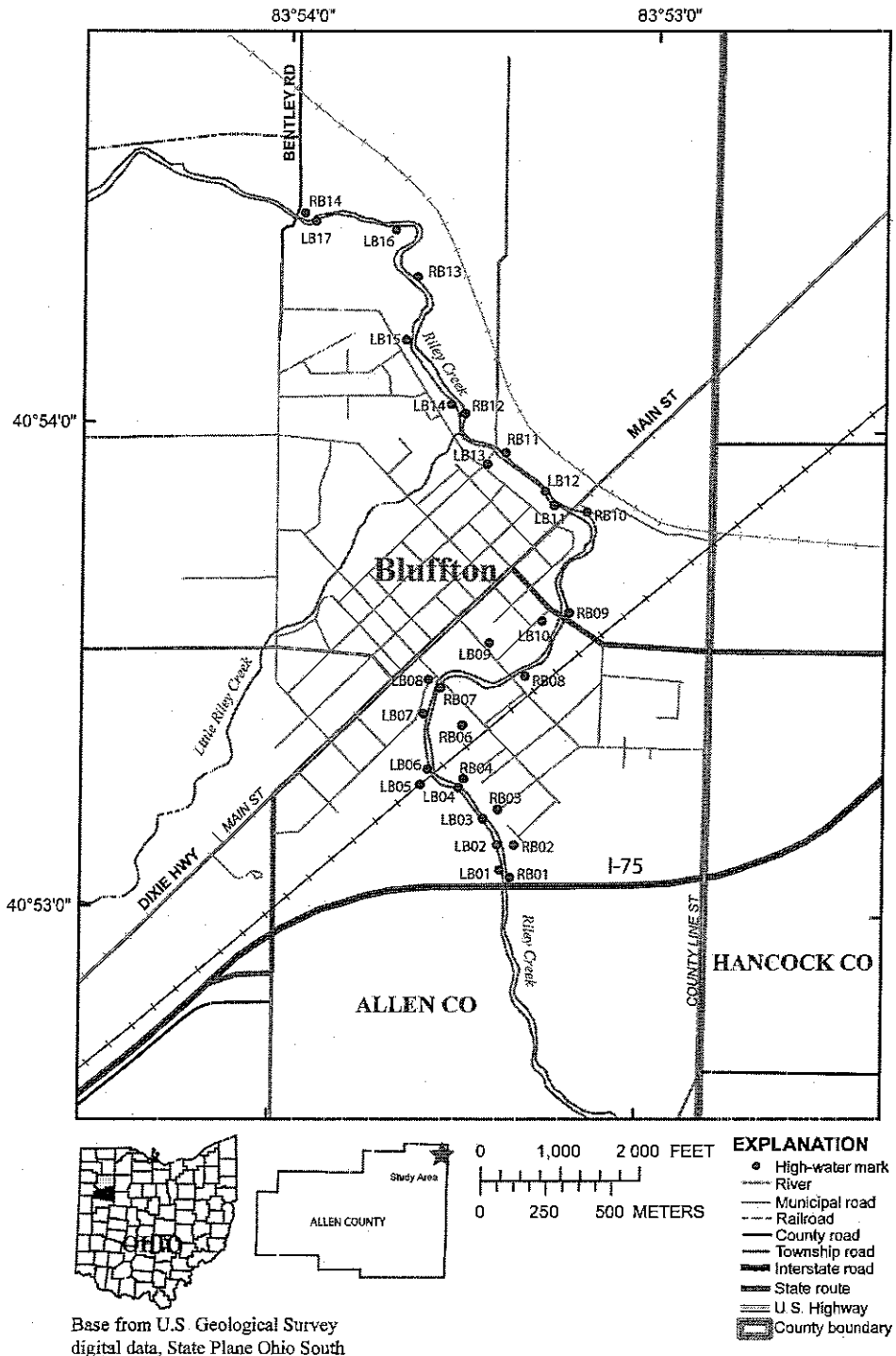


Figure 6. Locations of high-water marks along Riley Creek in and near the village of Bluffton, Ohio.

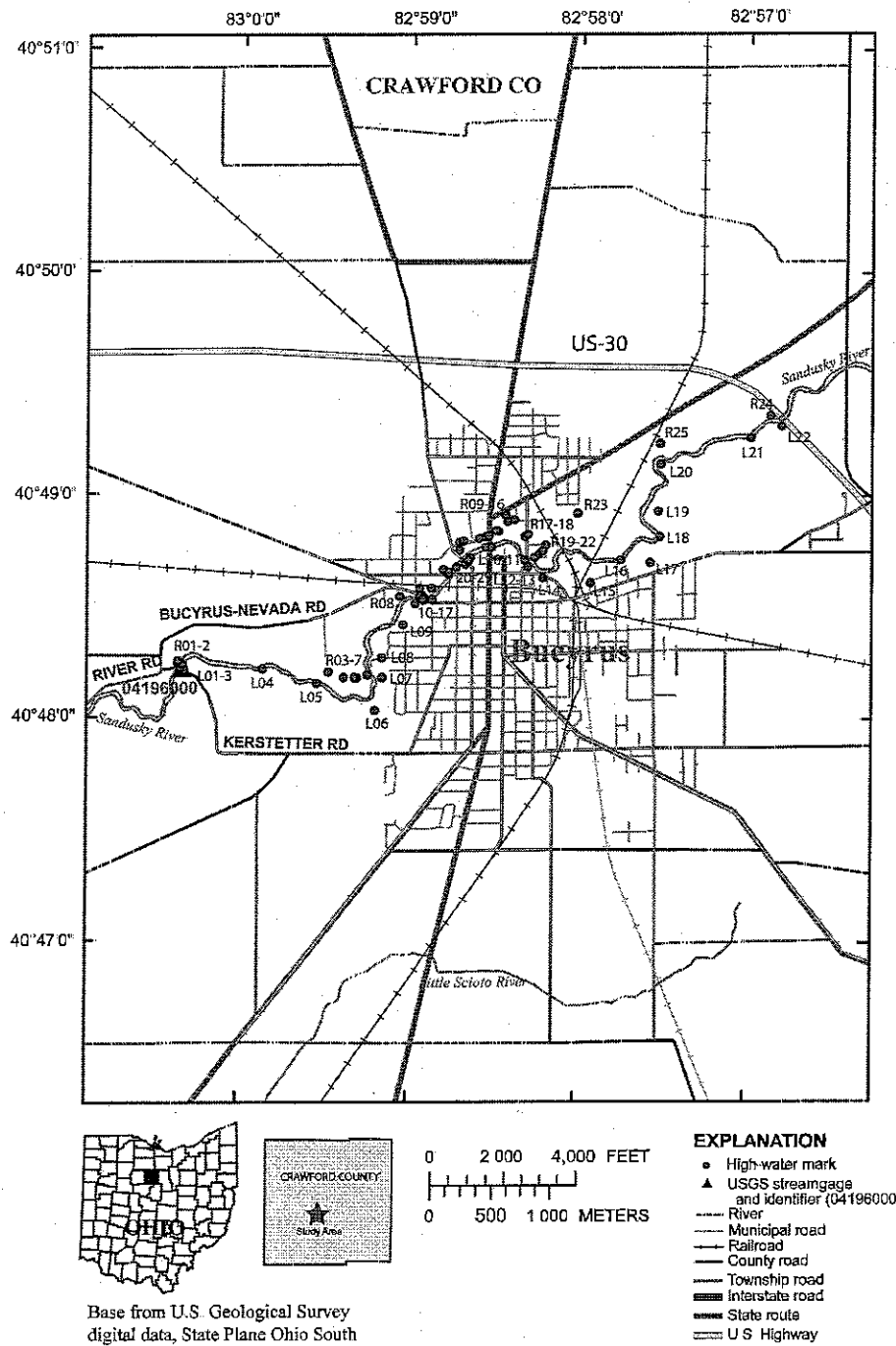


Figure 7. Locations of high-water marks along the Sandusky River in and near the city of Bucyrus, Ohio.

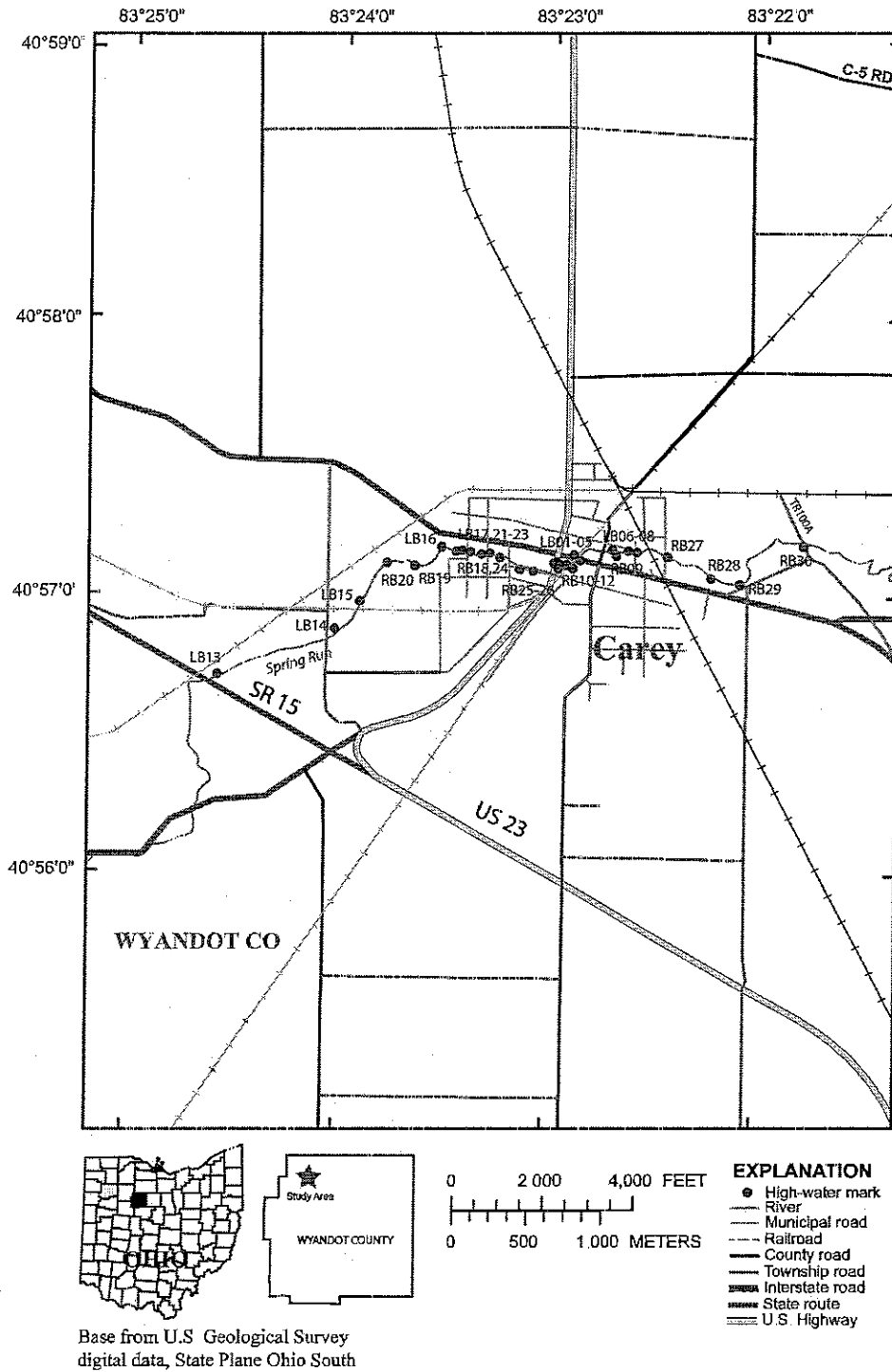


Figure 8. Locations of high-water marks along Spring Run in and near the village of Carey, Ohio.

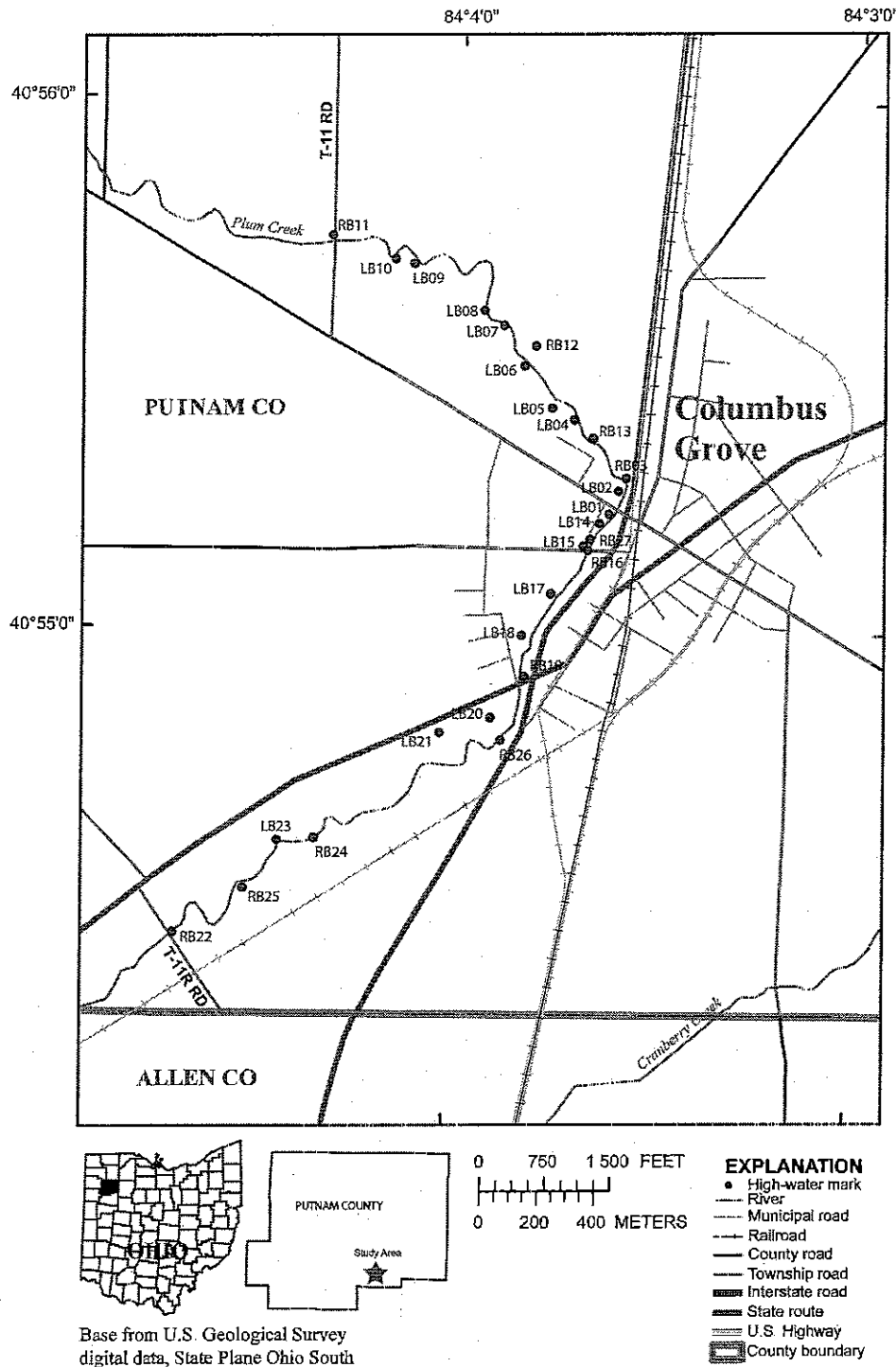
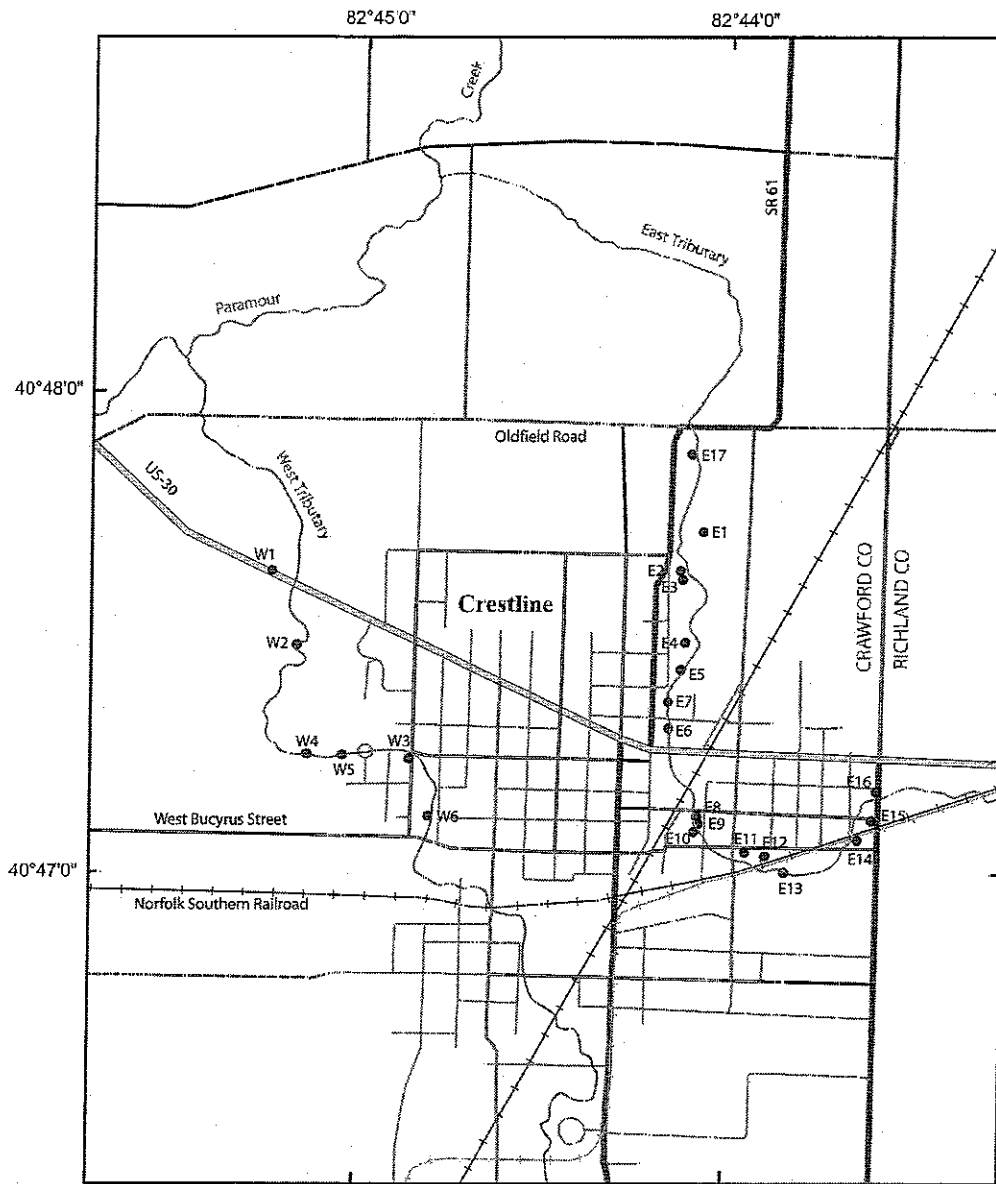
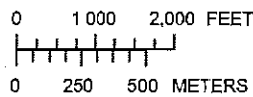
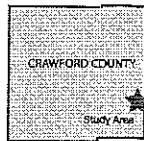


Figure 9. Locations of high-water marks along Plum Creek in and near the village of Columbus Grove, Ohio.



Base from U.S. Geological Survey digital data, State Plane Ohio South



- EXPLANATION**
- High-water mark
 - River
 - Municipal road
 - Railroad
 - County road
 - Township road
 - Interstate road
 - State route
 - U.S. Highway
 - ▭ County boundary

Figure 10. Locations of high-water marks along east and west unnamed tributaries of Paramour Creek in and near the village of Crestline, Ohio.

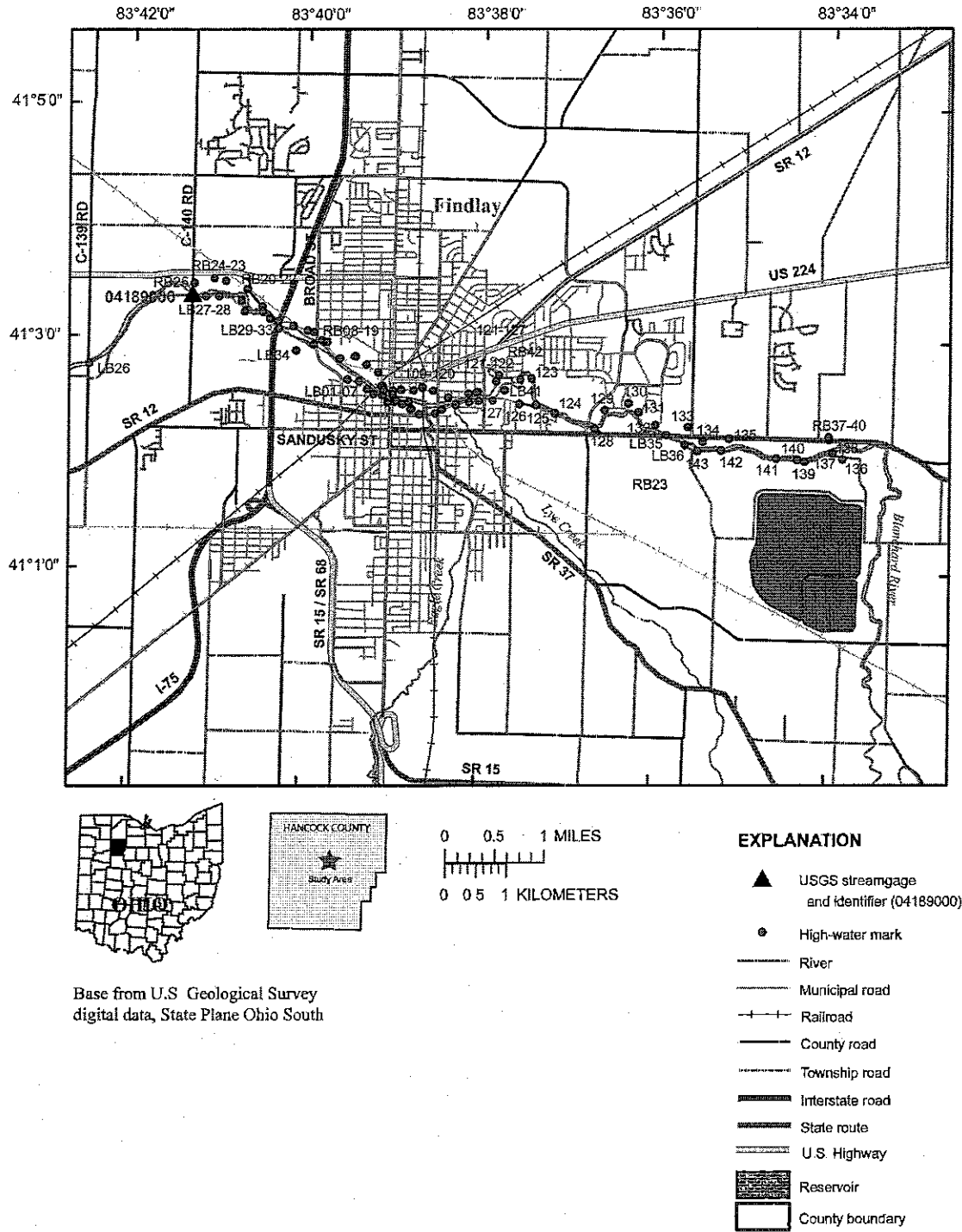


Figure 11. Locations of high-water marks along Blanchard River in and near the city of Findlay, Ohio.

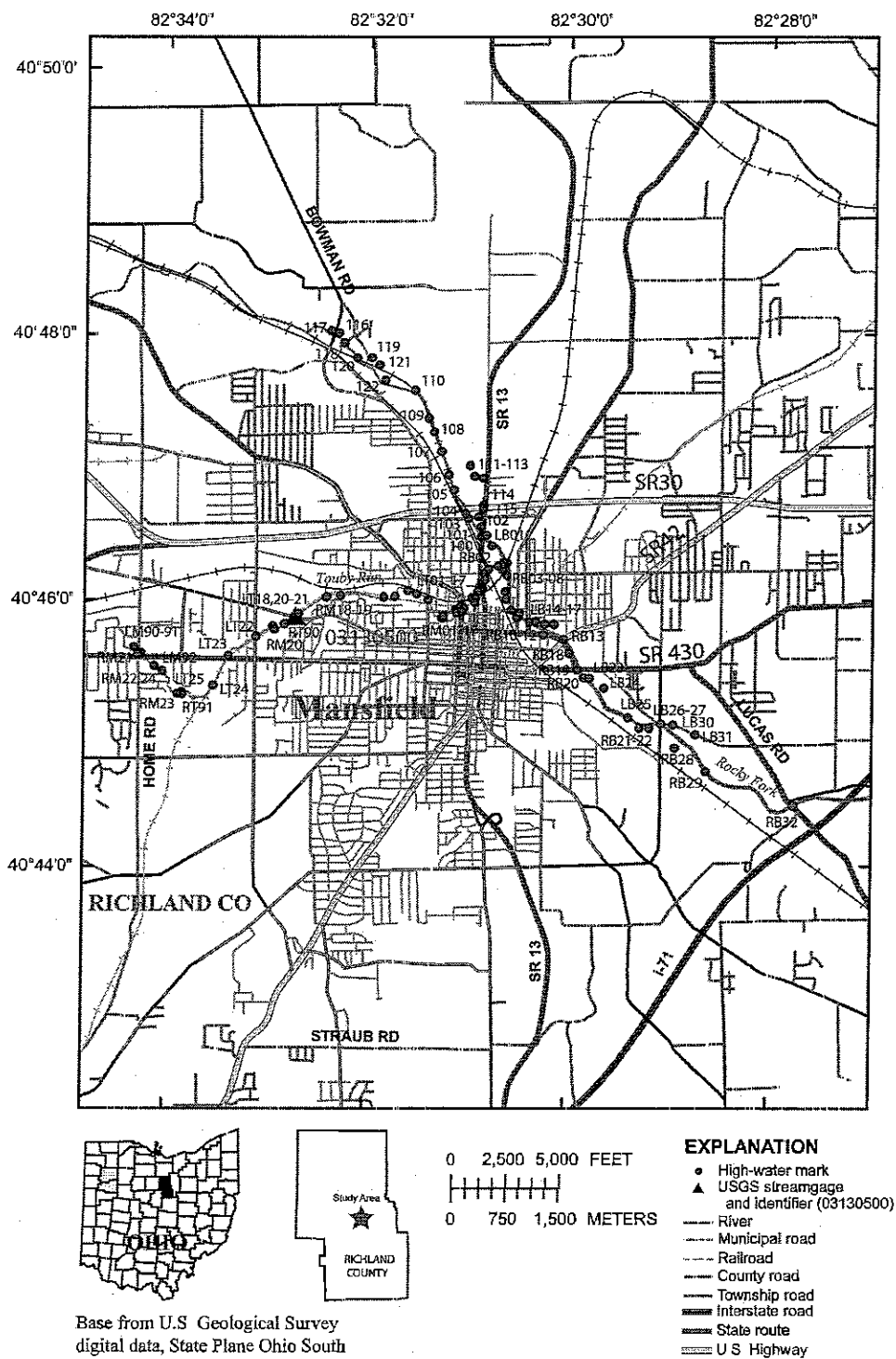


Figure 12. Locations of high-water marks along Rocky Fork Mohican River and Touby Run in and near the city of Mansfield, Ohio.

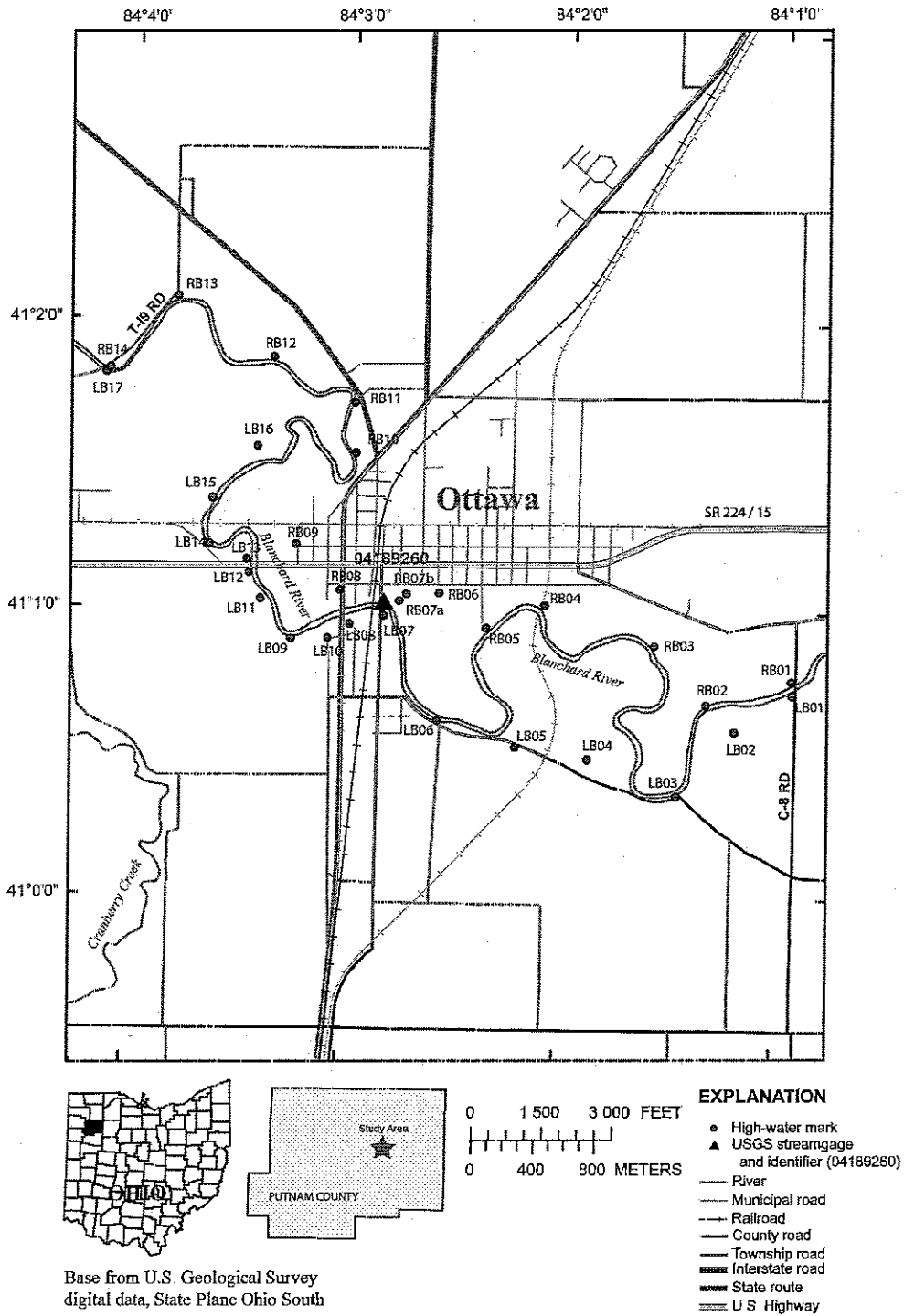


Figure 13. Locations of high-water marks along the Blanchard River in and near the city of Ottawa, Ohio.

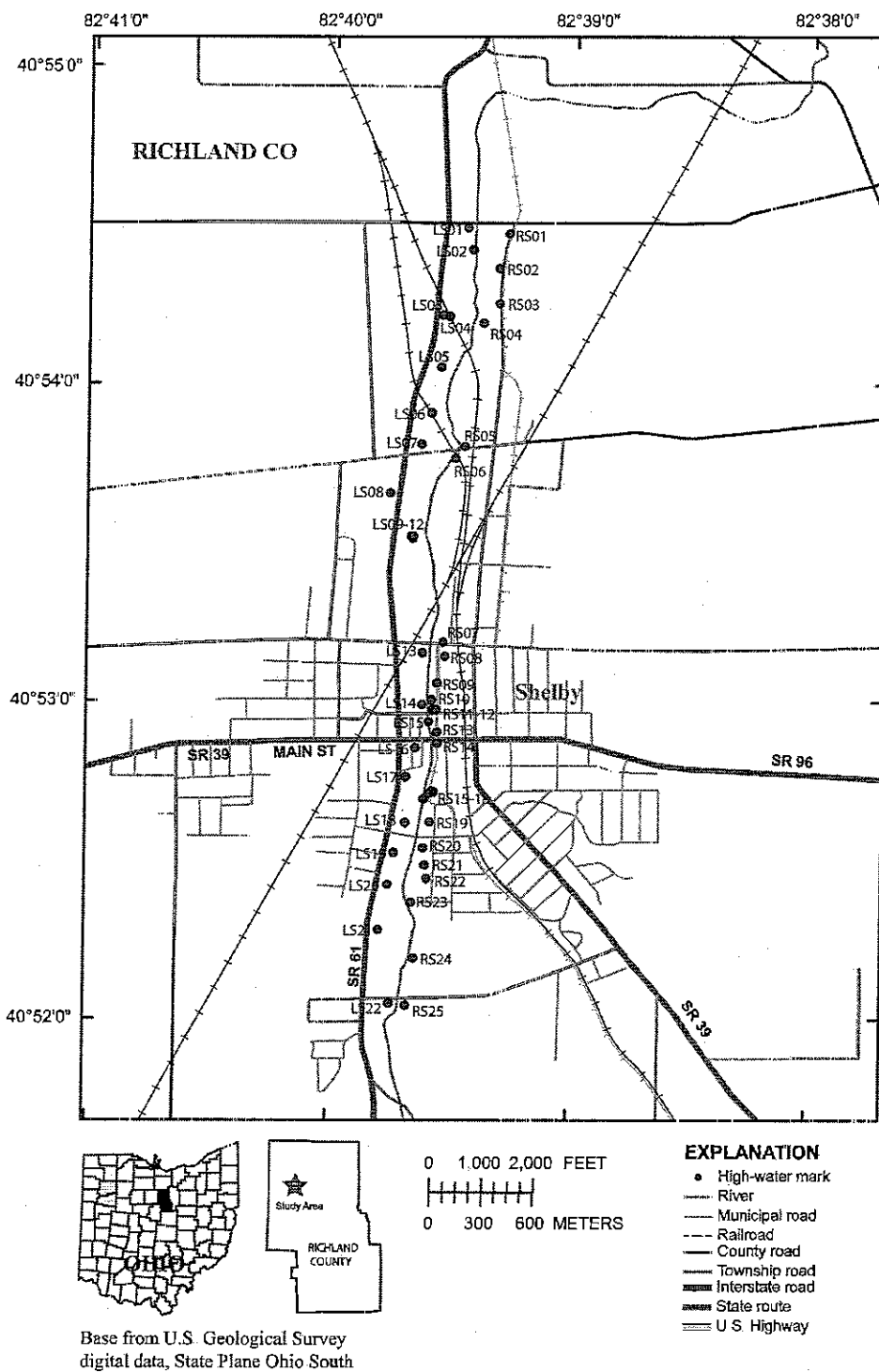


Figure 14. Locations of high-water marks along the Black Fork Mohican River in and near the city of Shelby, Ohio.

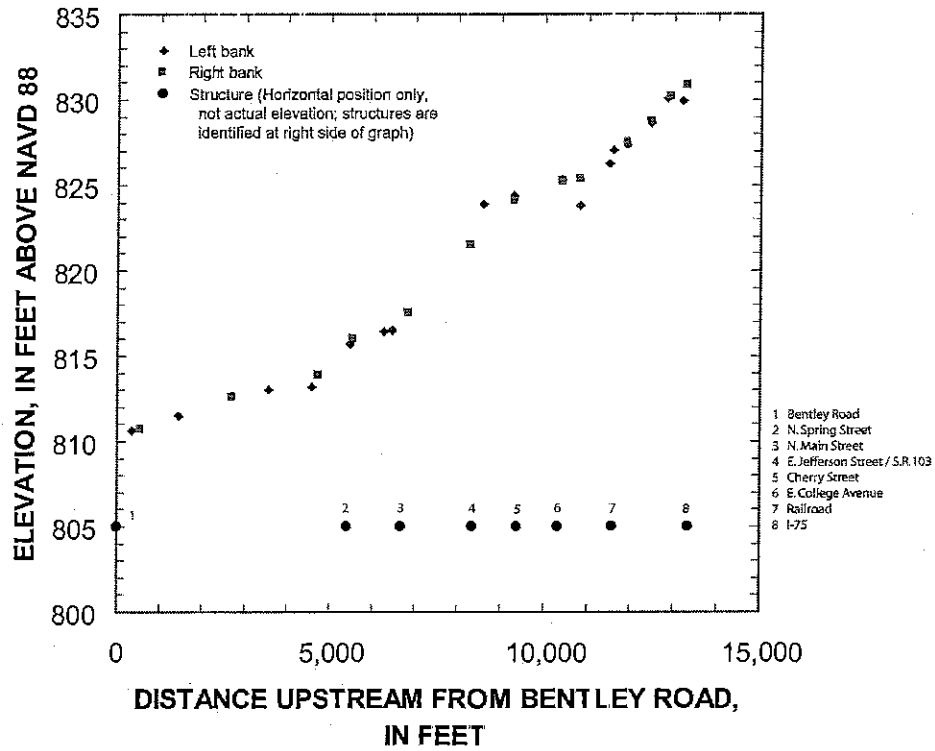


Figure 15. High-water-mark profile for Riley Creek in and near the village of Bluffton, Ohio.

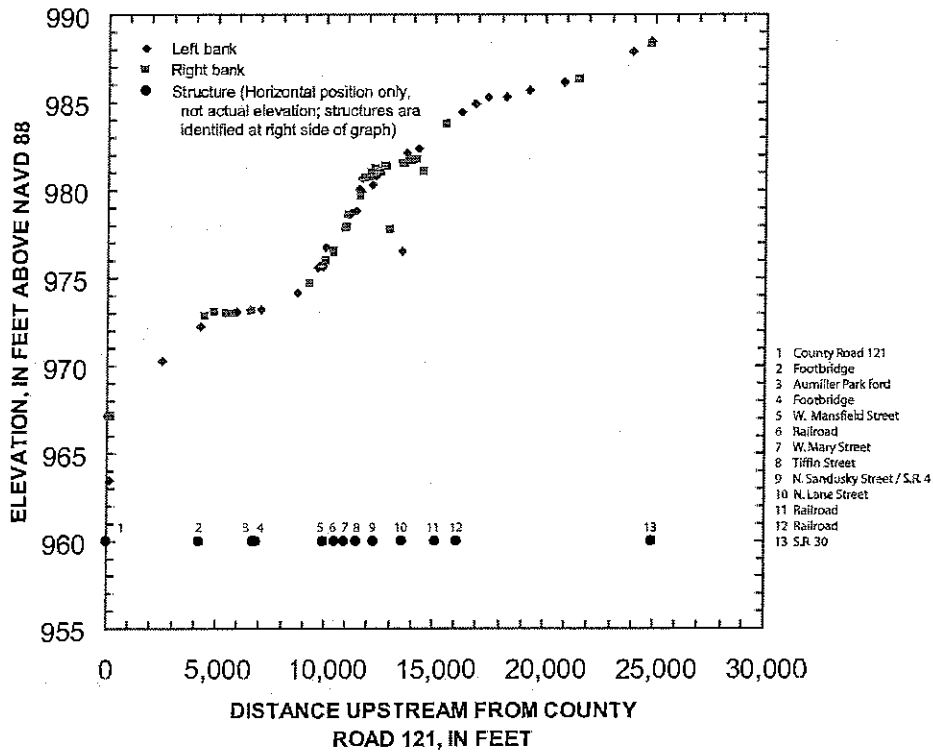


Figure 16. High-water-mark profile for the Sandusky River in and near the city of Bucyrus, Ohio.

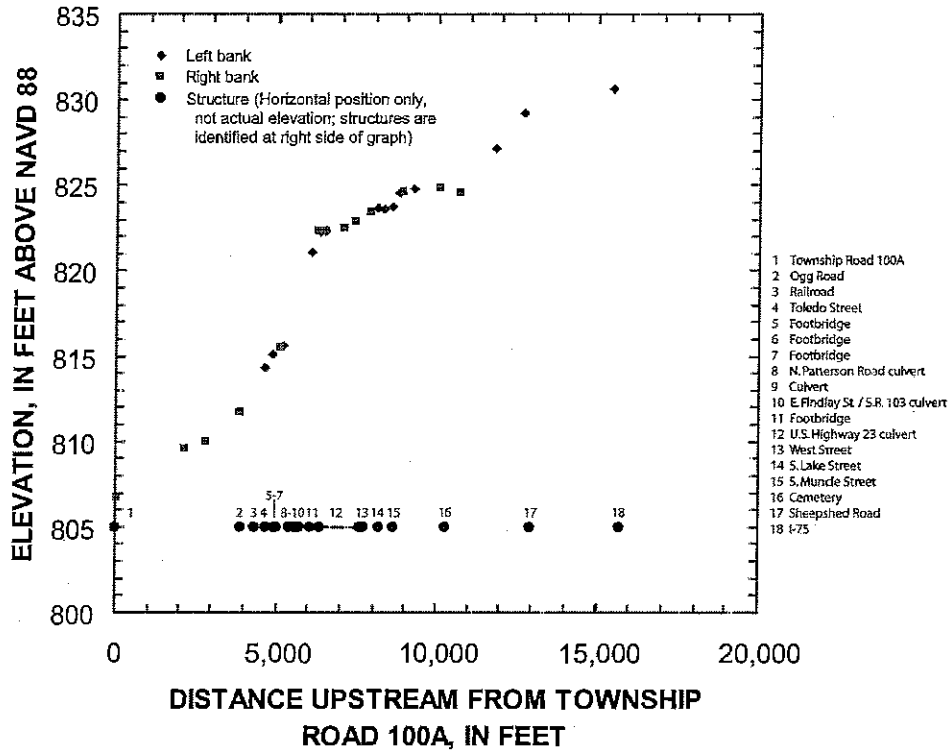


Figure 17. High-water-mark profile for Spring Run in and near the village of Carey, Ohio

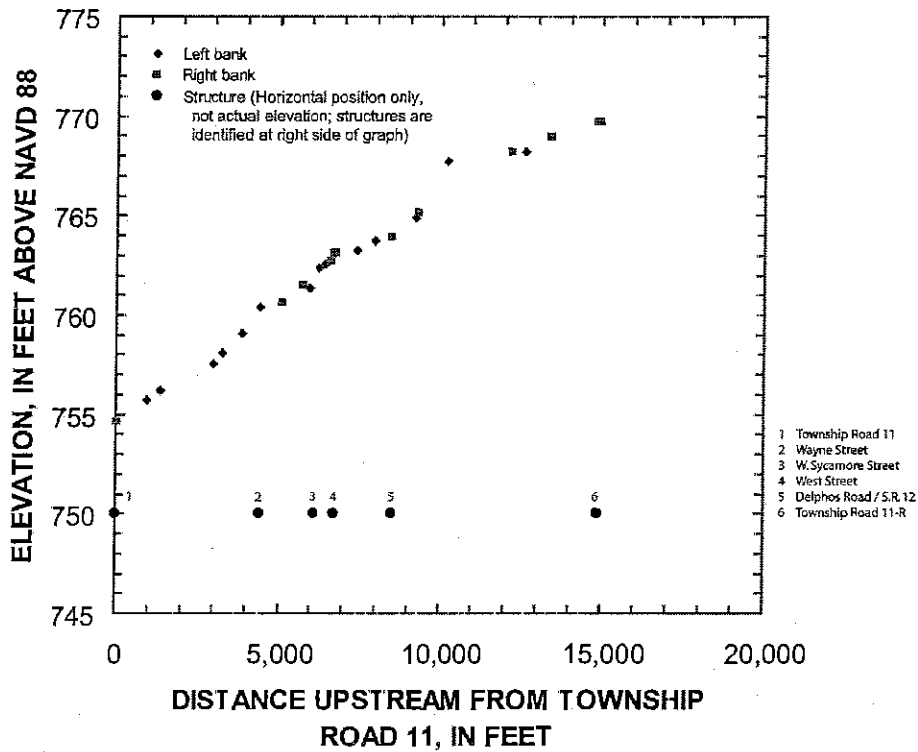


Figure 18. High-water-mark profile for Plum Creek in and near the village of Columbus Grove, Ohio.

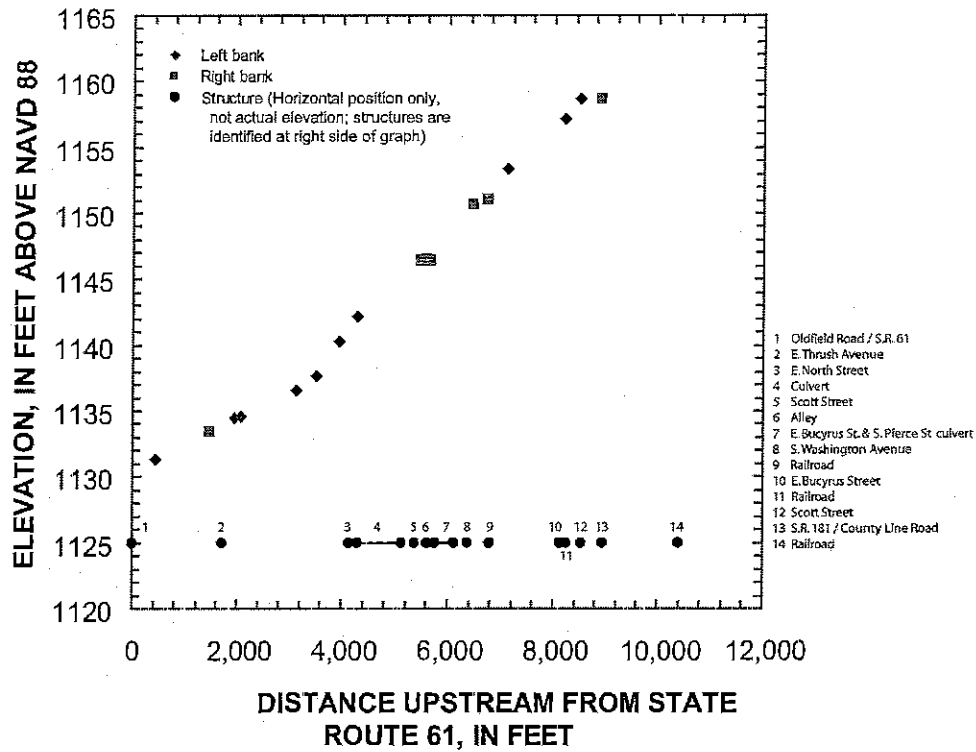


Figure 19. High-water-mark profile for the east unnamed tributary to Paramour Creek in and near the village of Crestline, Ohio.

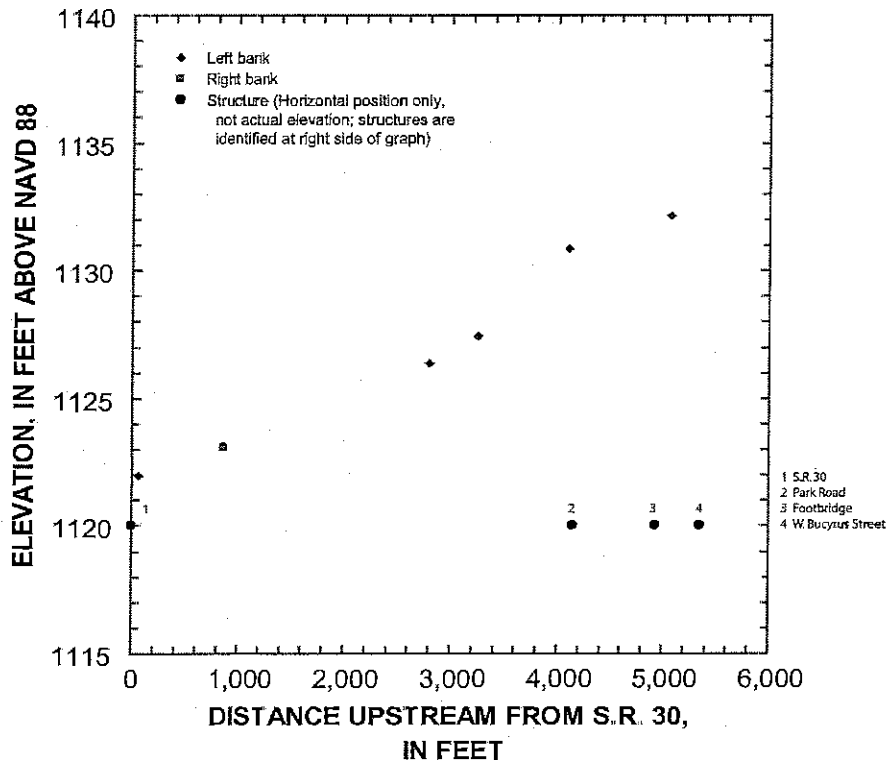


Figure 20. High-water-mark profile for the west unnamed tributary to Paramour Creek in and near the village of Crestline, Ohio.

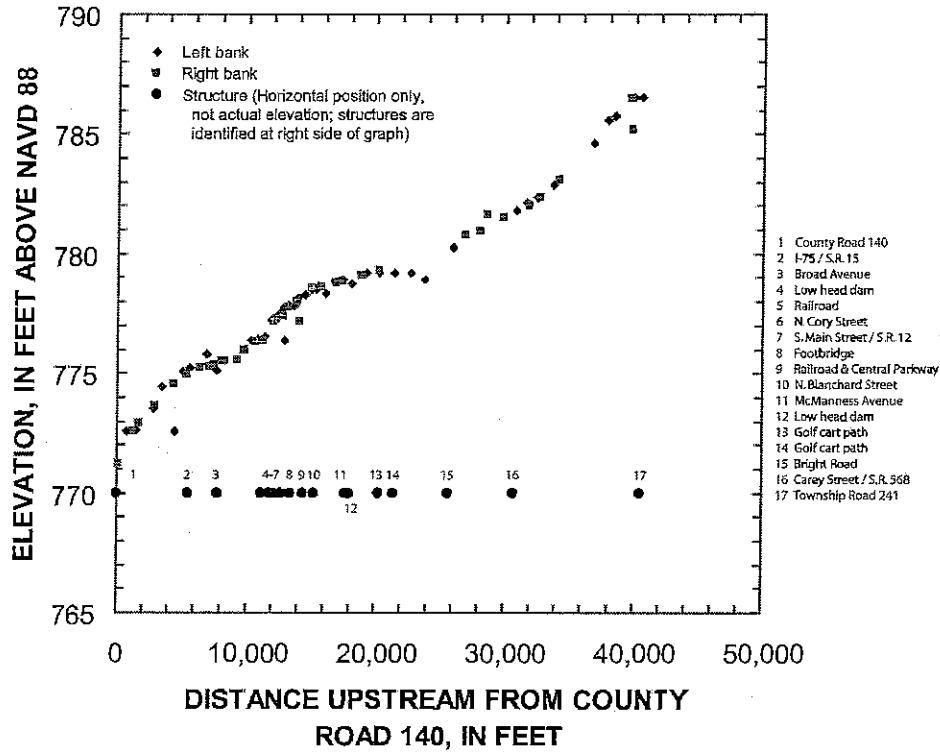


Figure 21. High-water-mark profile for the Blanchard River in and near the city of Findlay, Ohio.

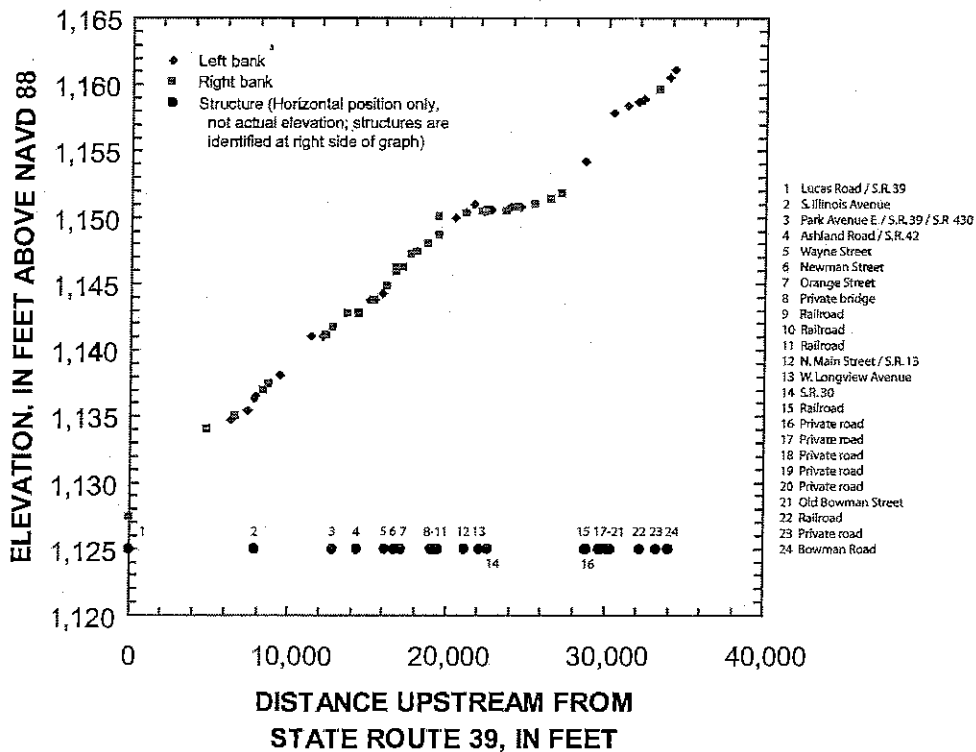


Figure 22. High-water-mark profile for the Rocky Fork Mohican River in and near the city of Mansfield, Ohio.

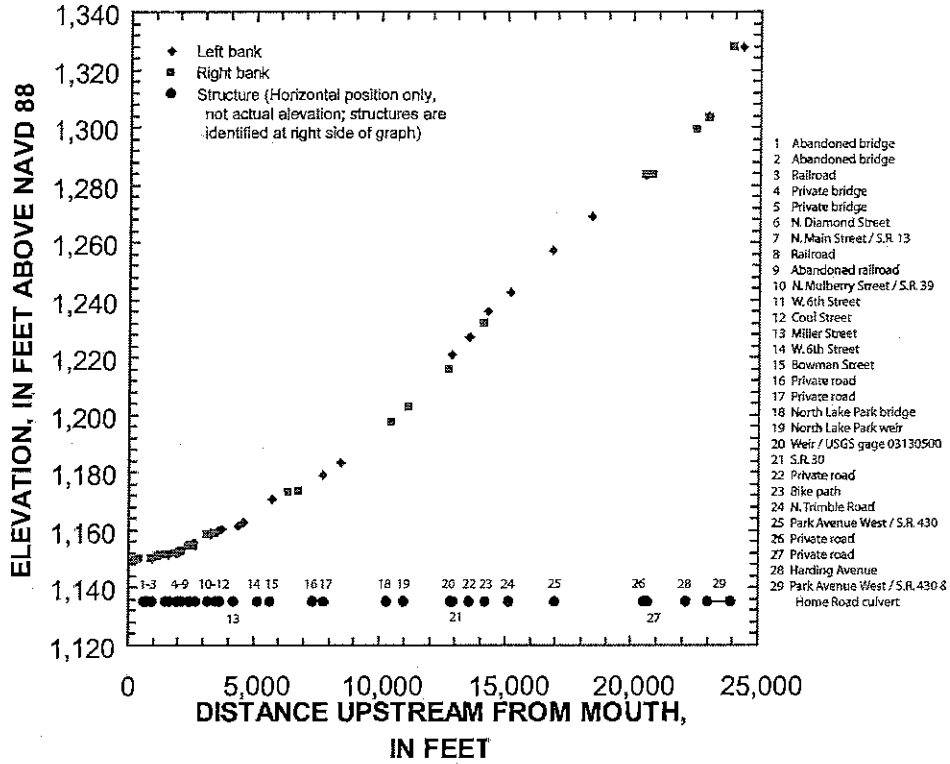


Figure 23. High-water-mark profile for Touby Run in and near the city of Mansfield, Ohio

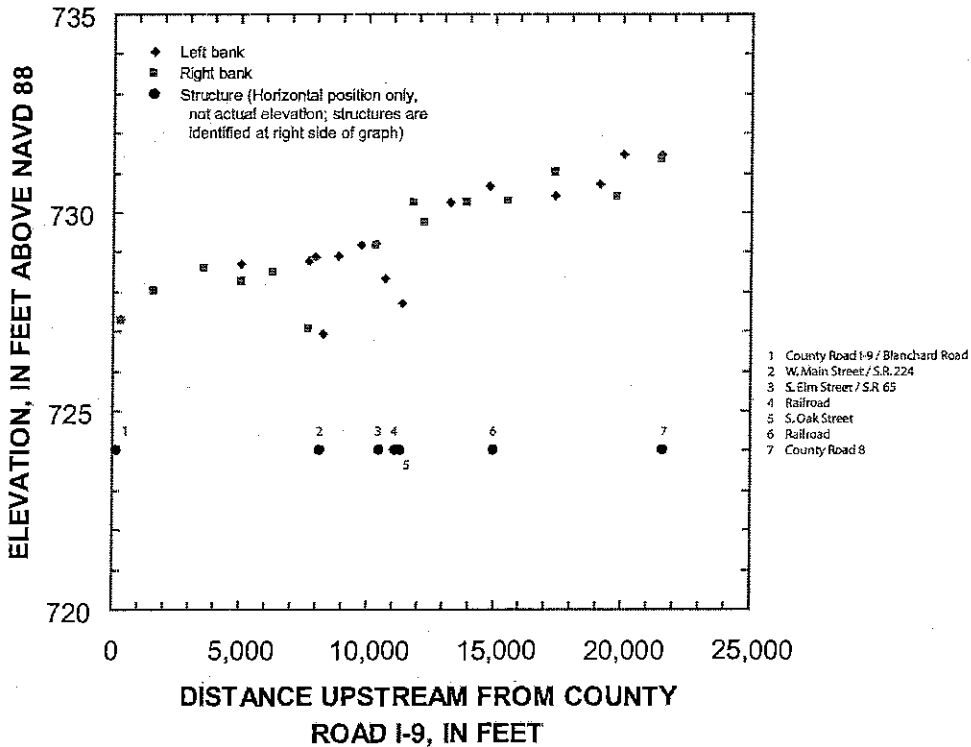


Figure 24. High-water-mark profile for the Blanchard River in and near the city of Ottawa, Ohio.

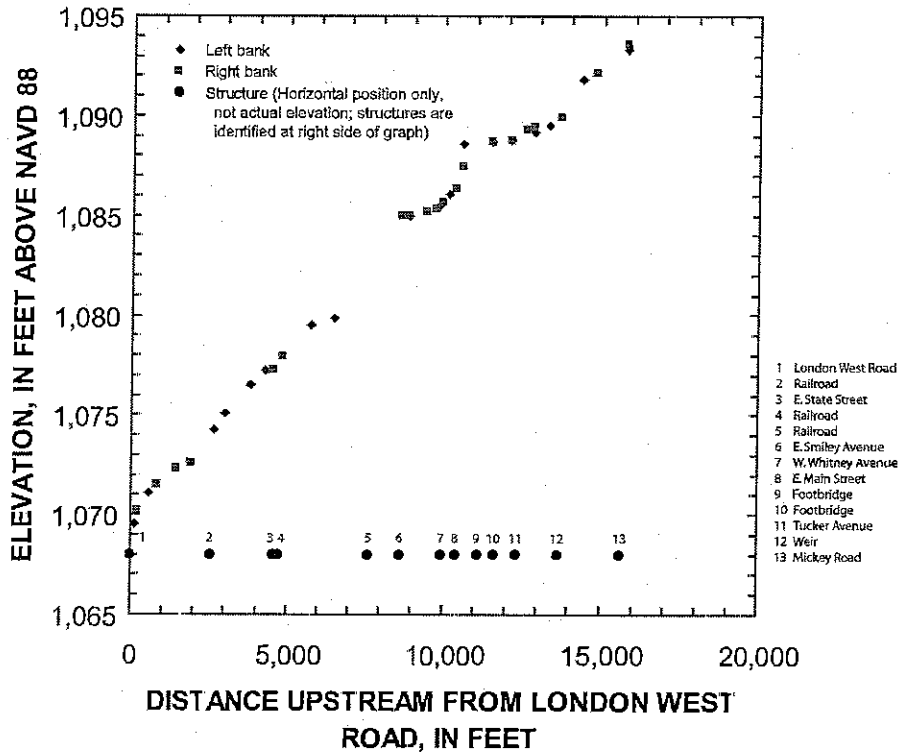


Figure 25. High-water-mark profile for the Black Fork Mohican River in and near the city of Shelby, Ohio

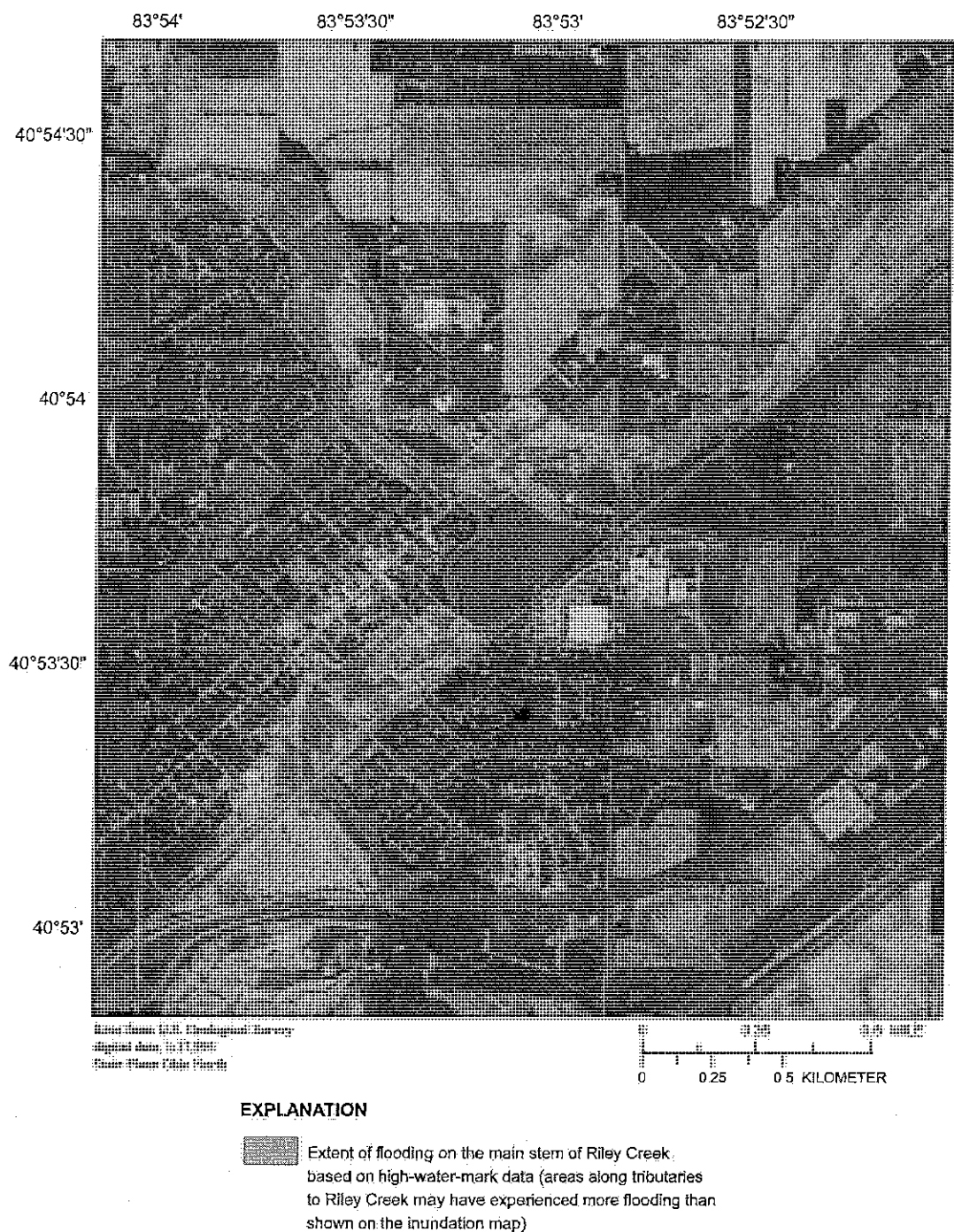
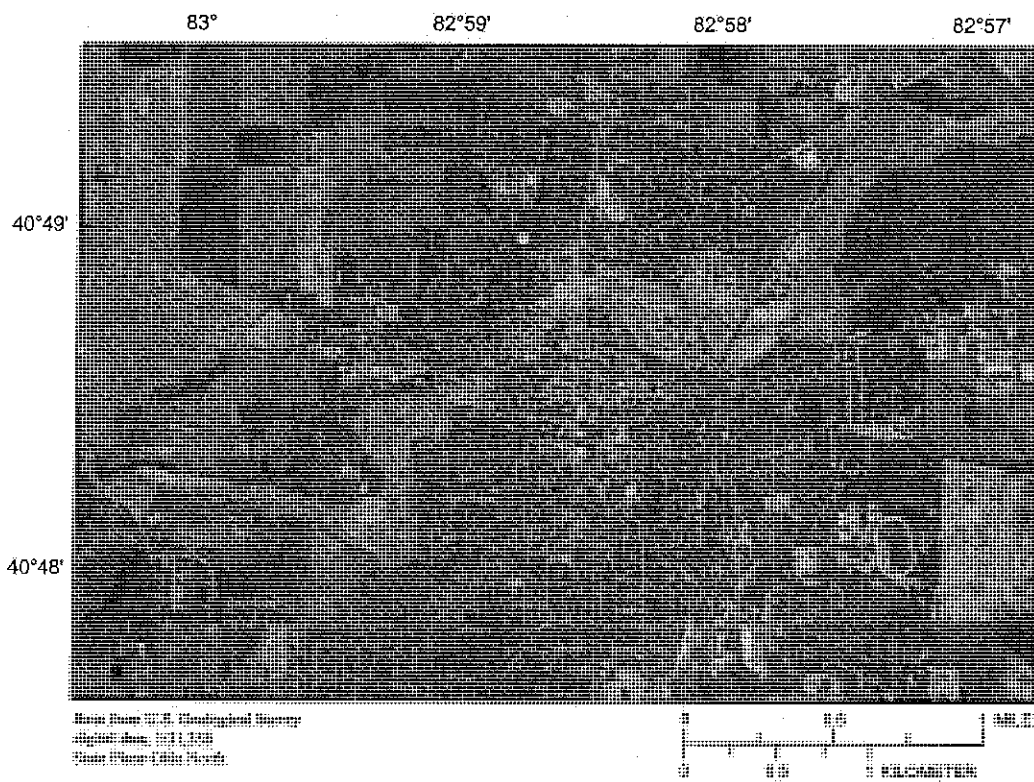


Figure 26 Estimated flood-inundation area for Riley Creek in and near the village of Bluffton, Ohio.



EXPLANATION


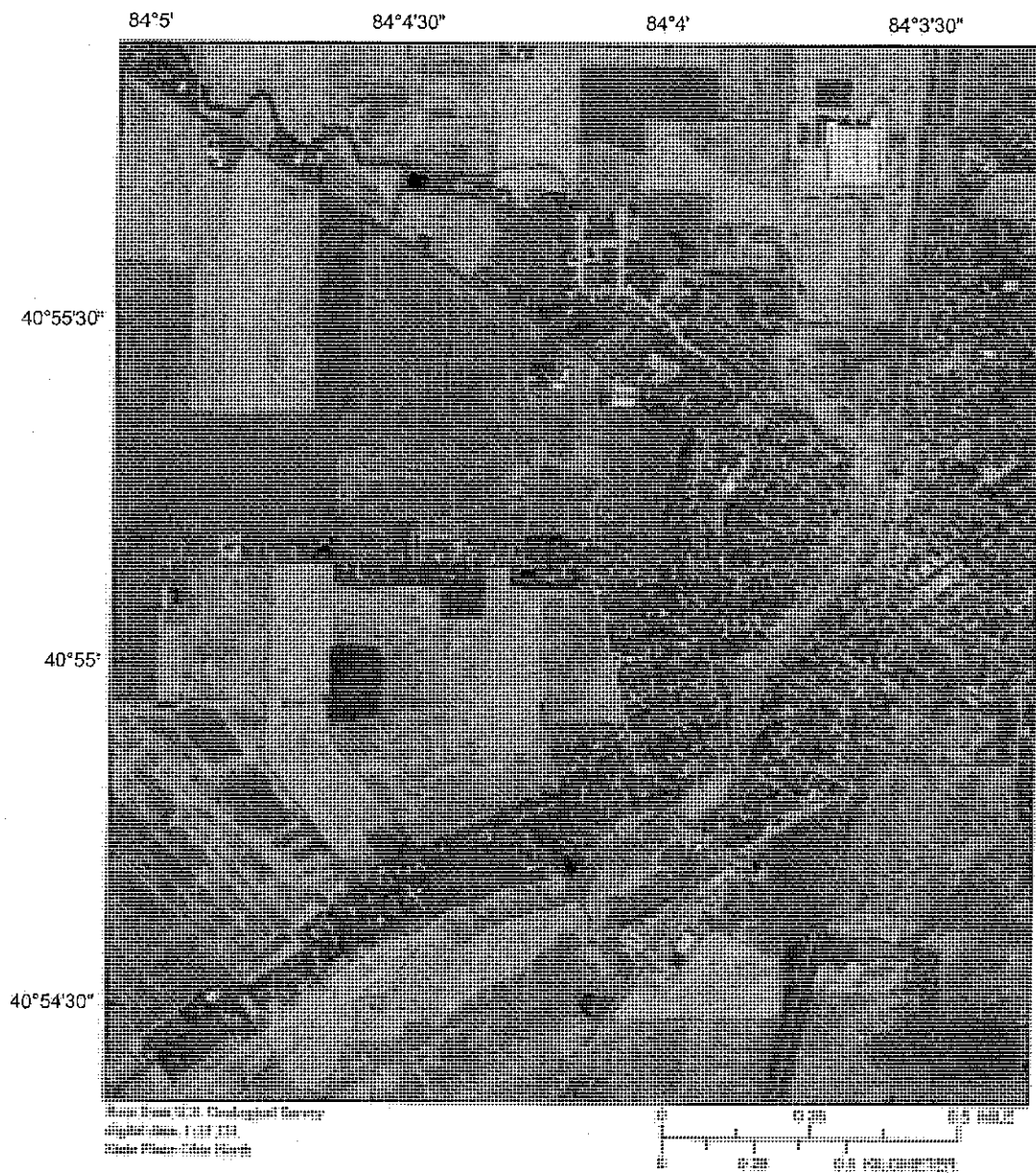
 Extent of flooding on the main stem of the Sandusky River based on high-water-mark data (areas along tributaries to the Sandusky River may have experienced more flooding than shown on the inundation map)

Figure 27. Estimated flood-inundation area for the Sandusky River in and near the city of Bucyrus, Ohio



Figure 28. Estimated flood-inundation area for Spring Run in and near the village of Carey, Ohio.



EXPLANATION


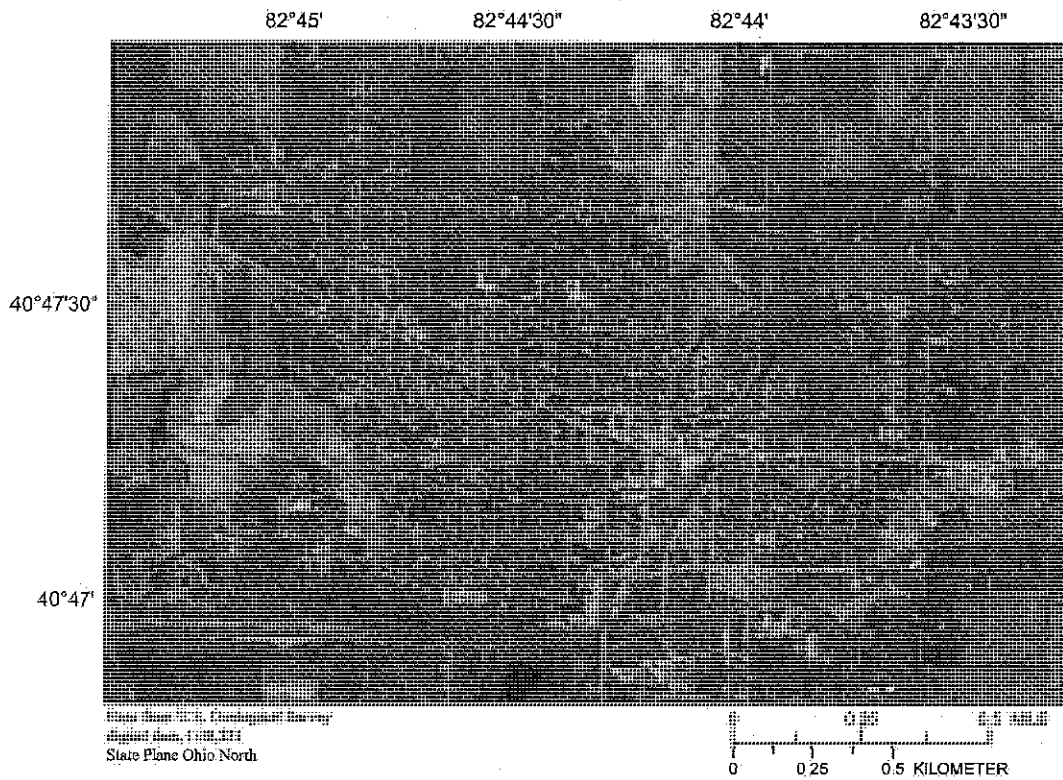
-  Extent of flooding on the main stem of Plum Creek, based on high-water-mark data (areas along tributaries to Plum Creek may have experienced more flooding than shown on the inundation map)

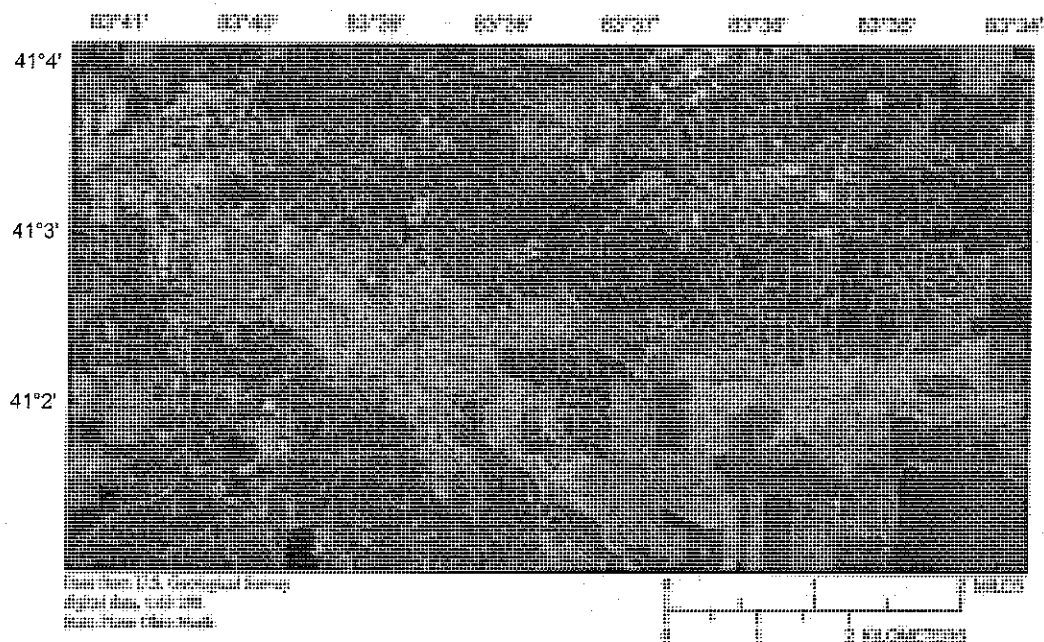
Figure 29. Estimated flood-inundation area for Plum Creek in and near the village of Columbus Grove, Ohio



EXPLANATION

- Extent of flooding on the main stems of east and west unnamed tributaries of Paramour Creek, based on high-water-mark data (areas along tributaries to these tributaries of Paramour Creek may have experienced more flooding than shown on the inundation map)

Figure 30. Estimated flood-inundation area for east and west unnamed tributaries of Paramour Creek in and near the village of Crestline, Ohio.



EXPLANATION


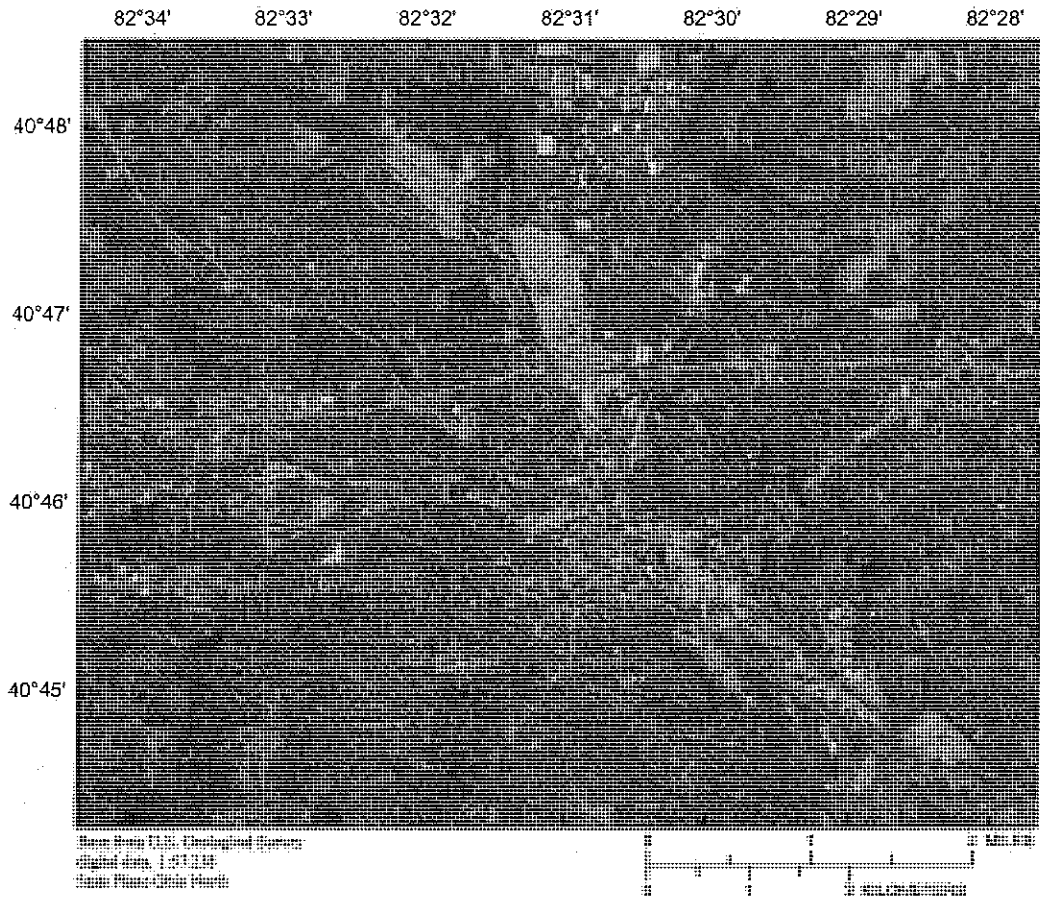
-  Extent of flooding on the main stem of the Blanchard River, based on high-water-mark data (areas along tributaries to the Blanchard River may have experienced more flooding than shown on the inundation map)

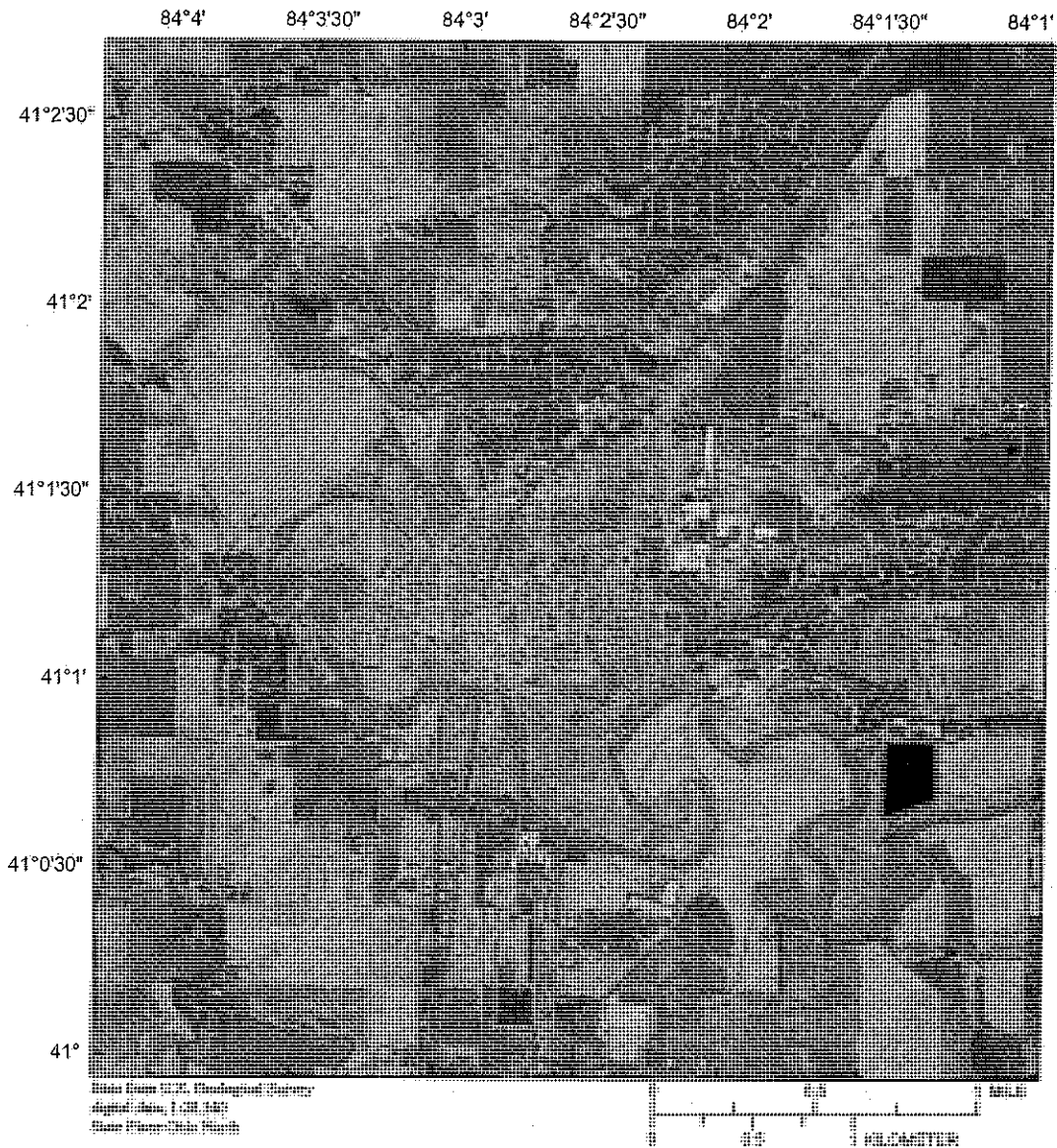
Figure 31. Estimated flood-inundation area for the Blanchard River in and near the city of Findlay, Ohio



EXPLANATION

- Extent of flooding on the main stems of Rocky Fork Mohican River and Touby Run based on high-water-mark data (areas along tributaries to Rocky Fork Mohican River and Touby Run may have experienced more flooding than shown on the inundation map)

Figure 32. Estimated flood-inundation area for Rocky Fork Mohican River and Touby Run in and near the city of Mansfield, Ohio.



EXPLANATION


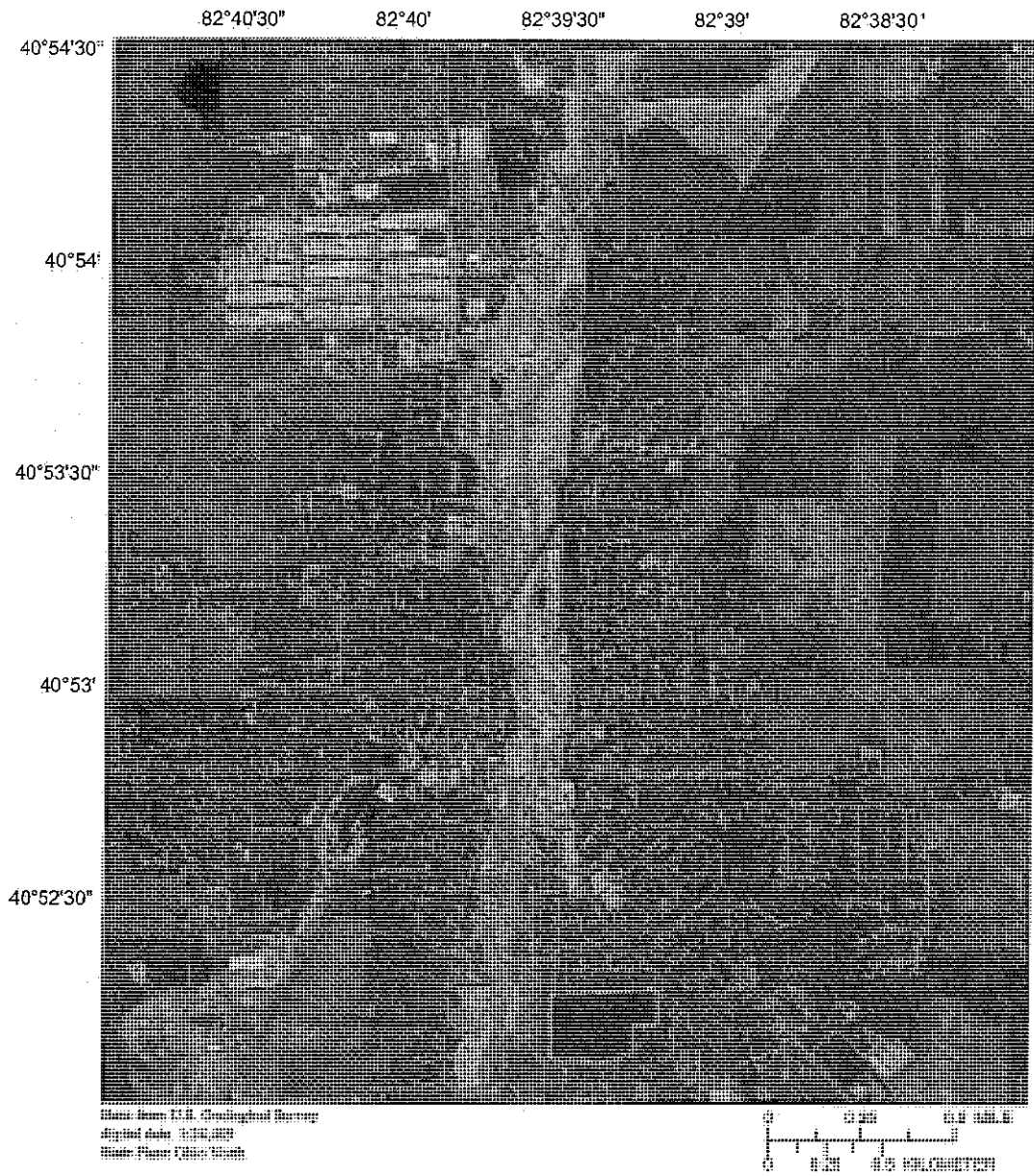
 Extent of flooding on the main stem of the Blanchard River, based on high-water-mark data (areas along tributaries to the Blanchard River may have experienced more flooding than shown on the inundation map)

Figure 33. Estimated flood-inundation area for the Blanchard River in and near the city of Ottawa, Ohio.



EXPLANATION

- Extent of flooding on the main stem of Black Fork Mohican River, based on high-water-mark data (areas along tributaries to Black Fork Mohican River may have experienced more flooding than shown on the inundation map)

Figure 34. Estimated flood-inundation area for the Black Fork Mohican River in and near the city of Shelby, Ohio.

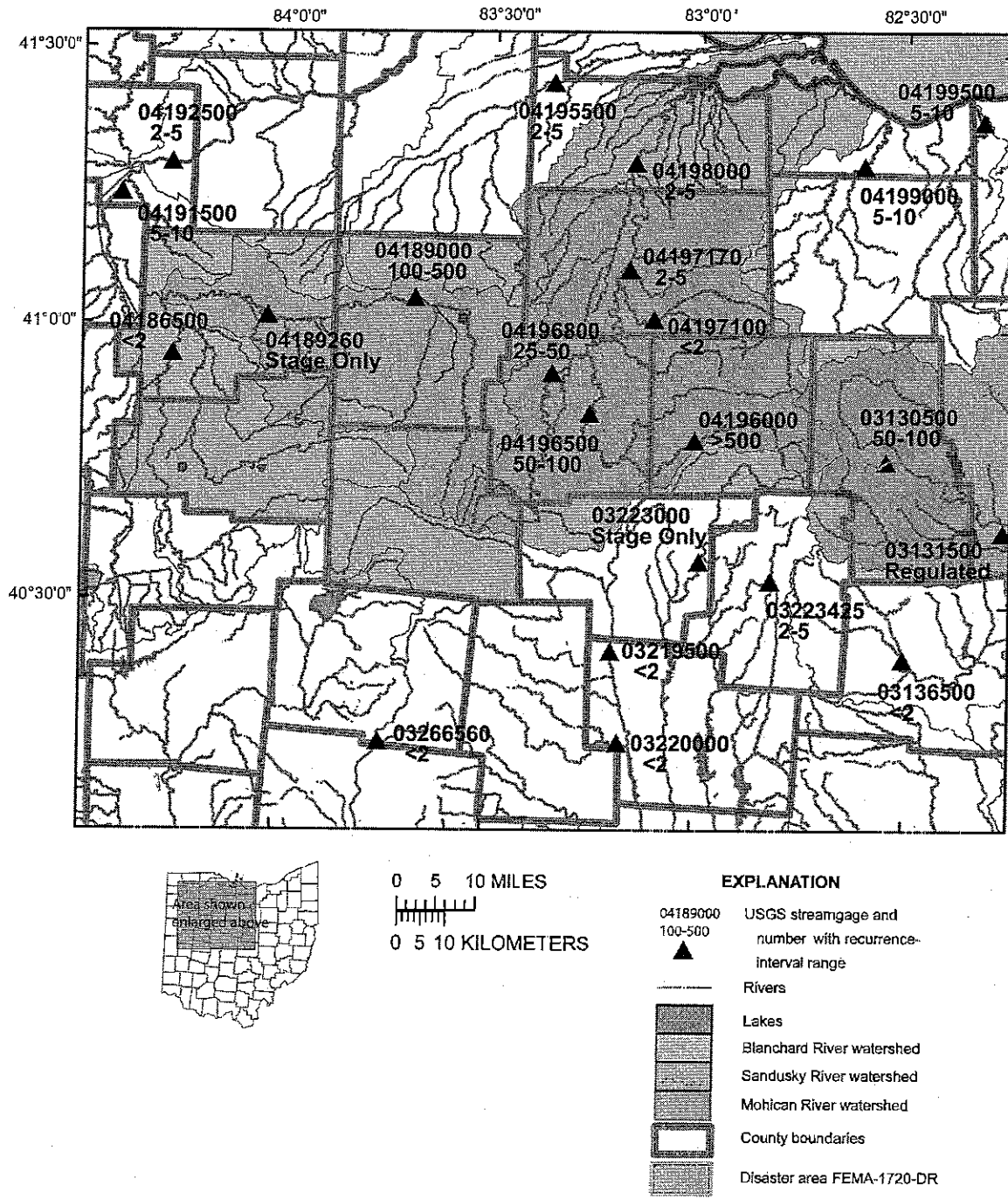


Figure 35. Location of selected USGS streamgages, with recurrence-interval ranges, in and around the designated disaster area for the flood of August 21–24, 2007.

