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GEOLOGICAL SURVEY

STATUS OF FLOOD-PLAIN MAPPING

GREATER PITTSBURGH REGION, PENNSYLVANIA

1972

by Robert M. Beall and Armando C. Lardieri

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INTRODUCTION

Flood plains that have a history of inundation or have a reasonable probability of being flooded, of course, need adequate attention in land-use planning, management, and development programs. Flood-plain maps and flood-plain-information reports are means of identifying these critical areas for special consideration.

Purpose and Scope

The purpose of this report is to show the extent of recent flood-mapping activity and the coverage by flood-plain-information reports in the six-county Greater Pittsburgh region and to provide summary information about the flood problems and flood investigations of urban places within the region. Areas subject to inundation are not shown here but are outlined in detail in sources cited in the text for those stream reaches shown on the map.

The Greater Pittsburgh regional studies, for which this report is a contribution, deal chiefly with the six western Pennsylvania counties of Allegheny, Armstrong, Beaver, Butler, Washington and Westmoreland.

Historical Note on the Flood Problem at Pittsburgh

Floods have been a notable factor in the development of western Pennsylvania. So much so that, at Pittsburgh, they have been reported regularly for more than two centuries (Jarvis and others, 1936, p. 162). Flooding has long been a bane to those who chose, for convenience or in ignorance, to occupy the small flood plains of the region. This aspect of the competition between man and nature has been costly, as floods of widely varying severity have struck one part of the region or another at rather frequent but irregular intervals.

The flood problem at Pittsburgh was studied first in a comprehensive way by the Flood Commission of Pittsburgh, a local citizens committee, during 1908-12. The Commission recommended construction of 17 reservoirs in the upper reaches of the Allegheny and Monongahela River basins, with flood walls in the vicinity of the city for protection against minor peaks (Noecker and others, 1954). However, no action was taken, so no flood-control facilities were available to alleviate the devastation of the March 1936 flood.

1/ Chief, Flood Plain Management Services Branch, Pittsburgh District, U.S. Army Corps of Engineers.

Many miles of flood profiles were surveyed after the 1936 flood and an extensive flood-warning procedure was developed by the U.S. Weather Bureau (now National Weather Service), in Pennsylvania in cooperation with the State Department of Forests and Waters. Since 1936, ten flood-control reservoirs have been constructed and operated by the U.S. Army Corps of Engineers in the Ohio River basin above Pittsburgh, materially reducing flood crests and damages. Five other reservoirs with a primary flood-control function have been constructed in the Beaver River basin. Only one of these, Pymatuning, a state-built facility, was in operation prior to 1936. Since 1948 in the six-county Greater Pittsburgh Region, the Commonwealth of Pennsylvania has completed eight channel improvements, built one new dam and rehabilitated two others, and has completed 60 stream-clearance projects.

Solutions to Flood Problems

The consequences of the 1936 flood in the northeastern United States were so widespread and severe that the Federal Government, under the Flood Control Act of that year, first assumed responsibility for flood control on a national scale. A broad program of water-resources development ensued under that and subsequent flood-control acts.

In spite of the large scale effort in providing structural solutions--reservoirs, levees, floodways, and channel improvements -- there has been a nationwide trend of increasing property damage. This trend has been attributed to the increase in property values and increase in the use of flood-prone areas for buildings and other purposes. There has been a concomitant increasing concern for developing alternative solutions to the problem that has evolved to what is known today as "Flood-Plain Management", which involves consideration of all structural and non-structural aspects of reducing flood damages.

Flood problems, like others associated with the variability of natural events, have no clear-cut solution. In a brief report on flood information for flood-plain planning, Bue (1967) comments: "There are various (structural and nonstructural) approaches to the flood problem, all of which have been used and found effective to a degree. But no one measure is adequate in itself, except perhaps in minor floods, and if the flood is of rare magnitude all measures fail as a solution."

James E. Goddard recently (1971) provided a case-history discussion of several of the alternatives available for flood-damage prevention, in support of the thesis that economically and ecologically sound solutions can be developed.

The structural approaches mentioned previously attempt to control the water in one way or another. The nonstructural approach, on the other hand, consists mainly of regulation or management of the flood plains through land-use zoning and the application of flood-proofing measures. The latter are defined as adjustments to the surrounding terrain or to structures and contents to reduce flood damage. These protective remedies may be permanent, contingent, or emergency measures.

Flood forecasting and dissemination of flood warnings, as Bue also comments, although not control measures as such, play an important role in flood-damage reduction. They may save lives by enabling residents to evacuate potentially hazardous areas, and they may reduce property damage by enabling residents to put flood-proofing measures into effect.

Fundamental to all the measures mentioned, is the delineation of the flood-plain areas that have been or will be subject to inundation. The requirement for providing flood-plain information is specific in such legislation as The Flood Control Act of 1960 (PL 86-645), The National Flood Insurance Act of 1968 (PL-90-448), and in Federal policies on the use of flood plains (U.S. Congress, 1966; Executive Order 11296).

In southwestern Pennsylvania, flood plains are generally relatively narrow, flat areas paralleling rivers and streams, often well defined by a sharp break in slope where valley walls climb to adjacent hills and ridges. It is emphasized that these flood plains were subject to past flooding, indeed they were created by floods, and future flooding is not only a real possibility but is assured. However, only where detailed studies have been made can flood frequency, duration, and extent be estimated with reasonable confidence; thus, enabling measures to be taken to lessen effects of floods.

FLOOD-PLAIN-INVESTIGATIONS STATUS MAP

The scope, detail, format, content, and scale of flood-plain mapping differs widely. Information may be presented on topographic base maps, on planimetric maps showing only cultural detail, on aerial photographs, or on graphs of river-reach profiles. The maps may show areas inundated by one or more known floods, or those that might be inundated by a flood of some defined future expectancy, or both.

The accuracy with which flood areas are defined depends on the amount of detailed topographic and hydrologic data available and the degree of effort devoted to field surveys and analytical studies.

The accompanying status map does not differentiate by scope or accuracy of mapping and does not show reaches for which only flood profiles are available. It is intended to illustrate the areal extent of recent flood mapping within the Greater Pittsburgh region. Old flood studies have not been searched or referenced on the map because patterns and zones of inundation are subject to change. Flood-prone areas may be altered by encroachment from any or all sides; by channel improvement or flood-wall or levee construction, or by the natural or enhanced channel processes of scour and fill.

The flood-mapping activities shown for the six-county region are those of the U.S. Army Corps of Engineers, U.S. Geological Survey, and U.S. Department of Agriculture Soil Conservation Service.

Flood-Plain-Information Studies

Those stream reaches within the six-county Greater Pittsburgh region for which the Corps of Engineers has prepared flood-plain-information reports and also reaches where studies are currently in progress are shown on the status map. As described in the Corps' 1971 information pamphlet on their water-resource-development activities (p. viii, 77):

> "The Chief of Engineers, through the Secretary of the Army is authorized by the Flood Control Act of 1960 (Section 206, PL 86-245) to provide information to States and local communities, upon their request, to aid them in providing for use and regulation of flood plain areas. The work done by the Corps under this authority involves surveying and mapping of flood plain areas, together with hydrology and frequency studies necessary to establish the flood damage potential, flood heights, and the extent of inundation of the areas involved. Such information is provided to aid local interests in establishing right-of-way lines, stream clearance lines, and land use regulations.*****Study requests are coordinated for the State by the Secretary, Department of Environmental Resources, Commonwealth of Pennsylvania, Harrisburg, Pennsylvania. Completed study reports are available in the office of the State coordinating agency, (in the office of the planning agency for the county involved in the study), or from the local community which is the subject of the report."

Flood-plain-information reports released through 1971 are listed in table 1. Studies currently in progress by the Corps of Engineers include the Ohio, Monongahela, Allegheny, and Youghiogheny Rivers within Allegheny County, Pa., the Ohio and Beaver Rivers within Beaver County, Pa., the Ohio River downstream from the Pennsylvania line, and the Mahoning River upstream from the State line.

In addition to flood-plain-information studies, the Corps has prepared comprehensive flood-insurance-oriented studies, for the Federal Insurance Administration, of Monongahela City and Neville Township, Pa., and is presently conducting studies of West Brownsville Borough and Union Township, Pa. These municipalities are among those designated by the Federal Insurance Administration as eligible for participation in the National Flood Insurance program. A flood-insurance study and its accompanying documentation shows the varying rates of hazard in different portions of the flood plain.

The flood-plain-information studies are, of course, only one aspect of the Corps' involvement with the flood problems of the region. The pamphlet dealing with water-resource-development activities mentioned above describe the many other Corps programs of investigations and operations.

Table 1.--U.S. CORPS OF ENGINEERS, FLOOD PLAIN INFORMATION STUDIES, GREATER PITTSBURGH REGION
Printed in year indicated. Availability described in text.

1. Sewickley Creek and Jacks Run: Hempfield Township, Westmoreland County, Pa. (1967)
2. Pigeon Creek: Bentleyville, Fallowfield Township and Somerset Township, Washington County, Pa. (1968)
3. Brush Creek: North Huntingdon Township, Westmoreland County, (1969)

Monongahela River: Washington County, Pa. (1970):

4. Centerville Borough and East Bethlehem Township (mile 65.6 to 56.6)
5. California, Coal Center, and West Brownsville (mile 56.5 to 50.0)
6. North Charleroi, Charleroi, Speers, Dunlevy, Allenport, Stockdale, Roscoe, and Elco (mile 50.0 to 40.8)
7. Carroll Township, Donora, and Fallowfield Township (mile 40.8 to 33.3)
8. Union Township, New Eagle and Monongahela (mile 33.3 to 25.0)

Monongahela River: Westmoreland County, Pa. (1971):

9. Monessen and Rostraver Township (mile 43.34 to 34.87)
10. Peters Creek: Jefferson Borough, Allegheny County, Pa. (1971)

The following are shown on the map but are beyond the Regional Studies Boundary

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11. Neshannock Creek Basin: Lawrence County, Pa. (1964)
12. Shenango and Mahoning Rivers: Lawrence County, Pa. (1965)

Flood-Prone Area Mapping

The measurement, documentation, and study of floods has long been a part of the U.S. Geological Survey's program of water-resources investigations. One current program of flood-plain mapping is based on field investigation and hydrologic analyses of specific floods, usually interpreted and described in terms of the probability and effect of future flooding. This type of program, as applied in the Chicago metropolitan area, has been described by Shaeffer and others (1970).

Another, but less detailed, type of flood mapping was recommended as a Survey responsibility in House Document 465, 89th Congress (1966). This has been done for reaches of 16 streams in the six counties of the Greater Pittsburgh region. These streams are listed in table 2 and the mapped reaches symbolized on the status map. Although table 2 lists affected municipalities, neither the boundaries nor names of townships are shown on the status map. Most of the listed boroughs appear on the map. Those areas that may be occasionally flooded by a relatively large flood are outlined on the named quadrangles. These simplified maps do not provide supplemental information on the frequency, depth, duration, or effects of flooding. Flood boundaries are estimated for the most part on the basis of regional stage-frequency relations.

Flood-prone-area mapping for a few stream reaches beyond the regional boundary is shown on the status map and included in table 2 because, at some point downstream, these streams do enter the area of principal interest.

Table 2.--U.S. GEOLOGICAL SURVEY, FLOOD-PRONE AREA MAPS, GREATER PITTSBURGH REGION
May be obtained without charge from the District Chief, Water Resources Division, U.S. Geological Survey, Box 1107, Harrisburg, PA. 17108 by indicated quadrangle name.

	Stream	Quadrangle(s)	Municipalities affected (Boroughs; Townships)
1.	Chartiers Creek	Bridgeville, Canonsburg	Bridgeville, Canonsburg, Houston; Cecil, Collier, North Strabane, Peters, Scott, South Fayette, Upper St. Clair, Allegheny and Washington Counties.
2.	Conemaugh River	New Florence, Vintondale	New Florence; St. Clair, Westmoreland County. (East and West Wheatfield, Indiana County.)
3.	Connoquenessing Creek	Evans City, Zelienople	Harmony, Zelienople; Forward, Jackson, Marion, Franklin, Butler and Beaver Counties.
4.	Crooked Creek	Elderton	Plum Creek and South Bend, Armstrong County. (Shelocta; Armstrong, Indiana County.)
5.	Jacobs Creek	Connellsville	Scottdale; East Huntingdon, Westmoreland County. (Everson, Bullskin, Upper Tyrone, Fayette County.)
6.	Little Beaver Creek	East Liverpool North	Glasgow, Ohioville, Beaver County. (Liverpool, Middletown, St. Clair, Columbiana County, Ohio)
7.	Loyalhanna Creek	Derry	Derry, Ligonier, Unity, Westmoreland County.
8.	N. Fk. Little Beaver River	New Galilee, East Liverpool N.	Darlington; Darlington, South Beaver, Beaver County. (Enon Valley; Big and Little Beaver, Lawrence County, Middletown, St. Clair, Columbiana County, Ohio)
9.	Ohio River	East Liverpool North	Georgetown, Glasgow, Ohioville; Greene, Beaver County.
10.	Pine Creek	Glenshaw	Etna; Shaler, Hampton, Allegheny County.
11.	Raccoon Creek	Aliquippa	Hopewell, Independence, Raccoon, Beaver County.
12.	Sewickley Creek	Smithton	Hempfield, Sewickley, South Huntingdon, Westmoreland County.
13.	Slippery Rock Creek	Harlansburg, Slippery Rock	West Liberty; Brady, Slippery Rock, Worth, Butler County. (Scott, Lawrence County.)
14.	Tenmile Creek	Ellsworth, Mather	Deemston, Marianna; East and West Bethlehem, Washington County. (Morgan, Greene County.)
-	Wolf Creek (See 13)	Slippery Rock	Slippery Rock, Worth, Butler County.
15.	Youghiogheny River	Smithton	Rostraver, South Huntingdon, Westmoreland County.

Table 2.--U.S. GEOLOGICAL SURVEY, FLOOD-PRONE AREA MAPS, GREATER PITTSBURGH REGION - continued

The following are shown on the map but are beyond the Regional Studies Boundary

	Stream	Quadrangle(s)	Municipalities affected (Boroughs; Townships)
16.	Blacklick Creek	New Florence, Vintondale	Brush Valley, Buffington, East and West Wheatfield, Indiana County.
17.	Neshannock Creek	Mercer	Mercer; Cool Spring, East Lackawannock, Findley, Springfield, Mercer County.
18.	Redstone Creek	New Salem	Franklin, Menallen, Fayette County.
19.	Sandy Lick Creek	Reynoldsville	Pine Creek, Knox, Jefferson County.
20.	S. Fk. Tenmile Creek	Mather, Waynesburg	Waynesburg; Center, Franklin, Jefferson, Morgan, Greene County.
21.	Two Lick Creek	Clymer, Indiana	Clymer, Homer City; Center, Cherryhill, White, Indiana County
22.	Wolf Creek	Grove City	Grove City; Pine, Mercer County
23.	Youghiogheny River	Connellsville	Connellsville; Connellsville, Dunbar, Upper Tyrone, Fayette County.

Flood-Risk Photomosaics and Flood-Plain Soils Mapping

As part of the investigations and analyses associated with development of a work plan for the Cross Creek Watershed in Washington County, the Soil Conservation Service recently prepared a flood-plain-risk map on a photomosaic for the Avella-Browntown-Studa area (SCS-1 on status map). Flooded areas were shown for the maximum flood of record, September 1912, as well as those estimated for a flood of 100-year recurrence interval. Similarly, the printed work plan for Jacobs Creek Watershed (1968) contains a flood map on a photomosaic showing the area subject to inundation by a 100-year flood along a 3½ mile reach of Jacobs Creek (SCS-2) in the vicinity of Scottdale (Westmoreland County) and Everson (Fayette County). The mapped reaches are indicated on the status map.

In the course of soil surveys throughout the several counties of the region, a considerable amount of field data on the soil types associated with flood plains has been accumulated. This information is compiled on aerial photographs, which may be examined in the field offices of the Soil Conservation Service prior to publication. Although not compiled on flood-plain maps as such and, thus, not shown on the accompanying status map, the information is a useful guide for assessment of proposed development. In the published soil survey for Westmoreland County (1968), areas subject to flooding are associated with Atkins, Lindside, Melvin and Philo soil series and can be located on the map sheets contained in the survey report.

Flood Investigations and Warnings

In addition to the flood mapping described in the foregoing paragraphs, flood hazards and remedial measures have been studied for several locations throughout the region. This information is contained in Corps of Engineers and Soil Conservation Service reports as well as those of the Pennsylvania Department of Forests and Waters, whose activities are continuing in the successor agency, the Pennsylvania Department of Environmental Resources. Urban places for which studies have been made are discussed in a following section.

Flood forecasting is a function of the National Weather Service, a bureau of the National Oceanic and Atmospheric Administration. Operations in the Ohio River basin are directed, on the basis of local input, by a River Forecast Center in Cincinnati. The River District Office in Pittsburgh is responsible for the data management and for public dissemination of warnings, for the Ohio River and its tributaries upstream from Hannibal Lock and Dam, Ohio. In the course of carrying out these operations and because of the need for applying them to local situations, a considerable amount of information on the extent and effect of floods of various magnitudes has been accumulated. This information, however, is not available in published map form and, thus, is not indicated on the accompanying status map. Operations associated with the flood-warning system involve the collaboration of the Corps of Engineers and the agencies of the Commonwealth of Pennsylvania, in addition to local agencies and groups.

FLOOD PROBLEMS IN URBAN PLACES

One of the early efforts in support of the national program for managing flood losses was the preparation of a list containing information about the flood problems of urban places. The list was compiled in 1967 by the Corps of Engineers in collaboration with State and Federal agencies to alert Federal, State, and local agencies to the pervasive nature of the problem and to inform them of sources of more information and assistance.

The availability of 1970 census data has provided the opportunity for updating this list, not only for changes in status with regard to population, but also for changes in the status of flood studies and protection works.

The updated list of places within the Greater Pittsburgh region, which is presented in table 3, contains information about the dominant type of flood problems, studies that have been made or are in progress or have been authorized, protection works constructed or under construction or authorized, and places for which the National Weather Service considers the flood-warning system adequate.

Protection works and warnings, seldom provide complete protection. In many places, flood-protection works reduce damages on only one of the streams affecting the community. In other places, a dam upstream may provide only partial protection because of inflow of streams below the dam. The variability and magnitude of extreme natural events are such that man can seldom anticipate or cope with all of them.

SOURCES OF INFORMATION

CORPS OF ENGINEERS SURVEY INVESTIGATIONS, BASIN STUDIES, FLOOD PLAIN MANAGEMENT SERVICES
District Engineer, Pittsburgh District, U.S. Army Corps of Engineers, Federal Building, 1000 Liberty Avenue, Pittsburgh, PA 15222

GEOLOGICAL SURVEY GAGING STATION FLOOD RECORDS, FLOOD-PRONE AREA MAPS
District Chief, U.S. Geological Survey, Water Resources Division, Box 1107, Harrisburg, PA 17108

SOIL CONSERVATION SERVICE WATERSHED SURVEYS, FLOOD-RELATED SOIL SURVEY INFORMATION
Area Conservationist, USDA Soil Conservation Service, Box 264, Somerset, PA. 15501 (Allegheny, Beaver, Washington and Westmoreland Counties). Box 205, Clarion, PA. 16214 (Armstrong and Butler Counties).

WEATHER SERVICE FLOOD WARNING AND FLOOD STAGE INFORMATION
Meteorologist in Charge, National Weather Service, NOAA
Federal Building, 1000 Liberty Avenue, Pittsburgh, PA. 15222

STATE BASIN SURVEYS, STREAM ENCROACHMENT PROBLEMS AND PERMITS
District Engineer, Pennsylvania Department of Environmental Resources
140 East Mall, Carnegie, PA. 15106

NATIONAL FLOOD INSURANCE PROGRAM
Area Director, U.S. Department of Housing and Urban Development
Two Allegheny Center, Pittsburgh, PA. 15212

Table 3--LIST OF URBAN PLACES, GREATER PITTSBURGH REGION, WITH INFORMATION ABOUT FLOOD PROBLEMS, STUDIES, PROTECTION, AND WARNING

Reference notes for the table which follows on pages 12-15:

Urban places

Urban places are defined as cities or boroughs having 2,500 or more population, and townships or other unincorporated areas having not only 2,500 or more population but also a population density of 1,000 or more persons per square mile.

Place notes

Borough: Boro
Township: Twp
Unincorporated: Uninc
1 Part in Lawrence Co.
2 Part in Allegheny Co.

Type of problem recorded or perceived

Overflow: Flooding from stream overflow
Drainage: Local drainage problem
Combination of overflow and drainage
None

Flood studies - agency and status

CSR	Corps of Engineers survey report
CFPI	Corps of Engineers flood-plain-information report
USGS	Geological Survey flood-prone-area map
SCS	Soil Conservation Service watershed survey
State	State survey
Local	Locally accomplished survey, including flood hazard reports developed with Federal financial assistance
Complete	Study complete
Active	Study active
Pending	Corps study authorized or SCS study application received, neither funded

Flood protection - agency and status

CE	Corps of Engineers project
State	State constructed project (providing significant degree of protection
Local	Locally constructed project (providing significant degree of protection)
Constructed	Project constructed (either local protection, reservoir, or combination); date (year): ** = pre 1950
Active	Project authorized, under construction (includes advance engineering and design)
Pending	Project authorized, not funded for construction or for advance engineering and design
Unfeasible	Project found unfeasible for economic or engineering reasons; date (year)

Table 4 -LIST OF URBAN PLACES, GREATER PITTSBURGH REGION, WITH INFORMATION ABOUT FLOOD PROBLEMS, STUDIES, PROTECTION, AND WARNING - continued

Place name	Population (thousands)	Type of problem	Status of flood studies	Status of flood protection	Flood warning	Major river or stream
ALLEGHENY COUNTY						
Aspinwall Boro	3.5	Overflow	CFPI-active		Yes	Allegheny R., Guyasuta Run
Avalon Boro	7.0	Overflow	CFPI-active		No	Ohio R.
Baldwin Boro	26.7	Combination	CFPI-active		No	Streets Run, Monongahela R.
Baldwin Twp	2.6	Combination			No	Sawmill Run
Bellevue Boro	11.6	Overflow	CFPI-active		No	Ohio R., Jacks Run
Ben Avon Boro	2.7	Overflow	CFPI-active		No	Ohio R., Spruce Run
Bethel Park Boro	34.8	Combination			No	Piney Fork
Brackenridge Boro	4.8	Overflow	CSR-complete, CFPI-active	CE-pending	Yes	Allegheny R.
Braddock Boro	8.8	Overflow	CFPI-active		Yes	Monongahela R., Turtle Cr.
Braddock Hills Boro	2.5	Drainage				
Brentwood Boro	13.7	Drainage			No	
Bridgeville Boro	6.7	Overflow	CSR-complete, USGS-complete SCS-authorized	CE-active	No	Chartiers Cr.
Carnegie Boro	10.9	Overflow	CSR-complete, State-active	CE-active, State-constructed (68)	Yes	Chartiers Cr.
Castle Shannon Boro	11.9	Overflow	CSR-active		Yes	Sawmill Run
Cheswick Boro	2.6	Combination	CFPI-active		No	Allegheny R., Tawney Run
Churchill Boro	4.7	Drainage			No	Sawmill & Chalfont Runs
Clairton City	15.1	Overflow	CFPI-active		Yes	Monongahela R., Peters Cr.
Coraopolis Boro	8.4	Overflow	CFPI-active, State-active	CE-pending, State-constructed (**)	Yes	Ohio R.
Crafton Boro	8.2	Overflow		CE-active	No	Chartiers Cr.
Crescent Twp	2.9	Overflow	CFPI-active		Yes	Ohio R.
Dormont Boro	12.9	Drainage			No	
Dravosburg Boro	2.9	Overflow	CFPI-active		Yes	Monongahela R.
Duquesne City	11.4	Overflow	CFPI-active		No	Monongahela R., Thompson Run
East McKeesport Boro	3.2	Drainage			No	
East Pittsburgh Boro	3.0	Overflow	CSR-complete, CFPI-active	CE-constructed (62), State-cons. (**)	No	Turtle Cr.
Edgewood Boro	5.1	Drainage			No	
Elizabeth Twp	15.5	Combination	CFPI-active		No	Monongahela R., Yough. R.
Emsworth Boro	3.3	Overflow	CFPI-active		No	Ohio R.
Etna Boro	5.8	Overflow	CSR-complete, USGS-complete, CFPI-active	CE-constructed (39)	Yes	Allegheny R., Pine Cr.
Forest Hills Boro	9.6	Drainage			No	
Fox Chapel Boro	4.7	Drainage			No	Squaw Run
Franklin Park Boro	5.3	Drainage			No	Rippling & Bear Runs
Glassport Boro	7.5	Overflow	CFPI-active		Yes	Monongahela R.
Greentree Boro	6.4	Drainage			No	Whiskey Run
Harrison Twp (Natrona Heights)	14.4	Combination	CFPI-active	CE-pending	No	Allegheny R.
Homestead Boro	6.3	Overflow	CFPI-active		No	Monongahela R.
Ingram Boro	4.9	Drainage			No	
Jefferson Boro	8.5	Overflow	CFPI-complete		Yes	Peters Cr.
Kennedy Twp	6.9	Overflow	CFPI-active		No	Ohio R.
Liberty Boro	3.6	Drainage	CFPI-active		No	Youghiogheny R.
McCandless Twp	22.4	Overflow			Yes	Pine Cr.
McKeesport City	38.0	Overflow	CFPI-active		Yes	Monongahela R., Yough. R.
McKees Rocks Boro	11.9	Overflow	CFPI-active	CE-pending	Yes	Ohio R., Chartiers Cr.
Millvale Boro	5.8	Overflow	CSR-active, CFPI-active		Yes	Allegheny R., Girty's Run
Monroeville Boro	29.0	Overflow	CSR-complete	CE-constructed (67)	No	Turtle Cr.
Mt. Lebanon Twp	39.6	None			No	
Mt. Oliver Boro	5.5	None			No	
Munhall Boro	16.6	Overflow	CFPI-active, CSR-active		Yes	Monongahela R.

Place name	Population (thousands)	Type of problem	Status of flood studies	Status of flood protection	Flood warning	Major river or stream
ALLEGHENY COUNTY - continued						
North Braddock Boro	10.8	Overflow	CFPI-active		Yes	Monongahela R., Turtle Cr.
North Versailles Twp	13.4	Combination	CFPI-active		Yes	Monongahela R., Turtle Cr.
Oakmont Boro	7.6	Overflow	CFPI-active		Yes	Allegheny R.
O'Hara Twp	9.2	Overflow	CFPI-active		No	Allegheny R., Squaw Run
Penn Hills Twp	62.9	Drainage			No	Allegheny R.
Pitcairn Twp	4.7	Overflow	CSR-complete	CE-active	No	Turtle Cr.
Pittsburgh City	520.0	Overflow	CFPI-active	State-active	Yes	Ohio, Allegheny, Monongahela R.
Pleasant Hills Boro	10.4	Drainage			No	Lick & Lewis Runs
Plum Boro	21.9	Combination	CFPI-active		No	Allegheny R., 3 Creeks
Port Vue Boro	5.9	Overflow	CFPI-active		No	Youghiogheny R.
Rankin Boro	3.8	Overflow	CFPI-active		No	Monongahela R.
Reserve Twp	4.2	Drainage			No	
Ross Twp	32.9	Overflow	CSR-active		No	Girty's & Thompson Runs
Scott Twp	21.9	Overflow	CSR-complete, USGS-complete	CE-active	No	Chartiers Cr.
Sewickley Boro	5.7	Overflow	CFPI-active		No	Ohio R.
Shaler Twp	33.4	Drainage	CSR-active, USGS-complete		No	Pine Cr.
Sharpsburg Boro	5.5	Overflow	CFPI-active		Yes	Allegheny R.
Springdale Boro	5.2	Overflow	CFPI-active		Yes	Allegheny R.
Stowe Twp	10.1	Overflow	CFPI-active		No	Ohio R.
Swissvale Boro	13.8	Combination	CFPI-active		No	Monongahela R.
Tarentum Boro	7.4	Overflow	CSR-complete, CFPI-active	CE-constructed (62)	Yes	Allegheny R., Bull Cr.
Turtle Creek Boro	8.3	Overflow	CSR-complete, State-complete CFPI-active	CE-constructed (67)	No	Turtle Cr., Thompson Run
Upper St. Clair Twp	15.5	Overflow	USGS-complete		Yes	Chartiers Cr.
Verona Boro	3.7	Overflow	CFPI-active		Yes	Allegheny R., Plum Cr.
Versailles Boro	2.8	Drainage	CFPI-active		Yes	Youghiogheny R.
West Homestead Boro	3.8	Overflow	CFPI-active		Yes	Monongahela R.
West Mifflin Boro	28.0	Overflow	CFPI-active		No	Monongahela R., Thompson Run
West View Boro	8.3	None			No	
Whitehall Boro	16.6	Drainage			No	Sawmill Run
Whiteoak Boro	9.3	Drainage	CFPI-active		No	Youghiogheny R.
Wilkins Twp	8.7	Combination			No	Thompson Run
Wilkinsburg Boro	26.8	None			No	
Wilmerding Boro	3.2	Overflow	CSR-complete, CFPI-active	CE-constructed (67)	No	Turtle Cr.
ARMSTRONG COUNTY						
Ford City Boro	4.7	Overflow			Yes	Allegheny R.
Kittanning Boro	6.2	Overflow	CSR-complete	CE-constructed (48)	Yes	Allegheny R.
Leechburg Boro	3.0	Overflow			No	Kiskiminetas R.

Table 3--LIST OF URBAN PLACES, GREATER PITTSBURGH REGION, WITH INFORMATION ABOUT FLOOD PROBLEMS, STUDIES, PROTECTION, AND WARNING - continued

Place name	Population (thousands)	Type of problem	Status of flood studies	Status of flood protection	Flood warning	Major river or stream
BEAVER COUNTY						
Aliquippa Boro	22.3	Overflow	CFPI-active		Yes	Ohio R.
Ambridge Boro	11.3	Overflow	CFPI-active		Yes	Ohio R.
Baden Boro	5.5	Overflow	CFPI-active		No	Ohio R.
Beaver Boro	6.1	Overflow	CFPI-active		No	Ohio R.
Beaver Falls City	14.4	Overflow	CFPI-active		No	Beaver R., Walnut Bottom Run
Big Beaver Boro	2.7	Drainage	USGS-complete			Beaver R., 2 runs
Conway Boro	2.8	Overflow	CFPI-active		Yes	Ohio R.
Economy Boro	7.2	Combination	CFPI-active		No	Ohio R., N.F. Sewickley Cr.
Ellwood City[1] Boro	10.9	Drainage			No	Connoquenessing Cr.
Freedom Boro	2.6	Overflow	CFPI-active		Yes	Ohio R.
Harmony- Twp (Ambridge Heights)	5.0	Overflow	CSR-active, SCS-active CFPI-active		No	Ohio R.
Midland Boro	5.3	Overflow	CFPI-active		No	Ohio R.
Monaca Boro	7.5	Overflow	CFPI-active		Yes	Ohio R.
New Brighton Boro	7.6	Overflow	CFPI-active		Yes	Beaver R., Blockhouse Run
Ohioville Boro	3.9	Combination			No	
Patterson Twp	3.4	Overflow	CFPI-active		No	Beaver R.
Rochester Boro	4.8	Overflow	CFPI-active		No	Ohio R., Beaver R.
Rochester Twp	4.1	Overflow	CFPI-active		No	Beaver R.
BUTLER COUNTY						
Butler City	18.7	Overflow	CSR-complete, SCS-pending	CE-constructed (66), State-cons.(**)	No	Connoquenessing Cr.
Homeacre-Lyndora Uninc.	8.4	Overflow	CSR-complete, SCS-active	CE-constructed (64)	No	Connoquenessing Cr.
Slippery Rock Boro	4.9	None			No	Wolf Cr. tributary
Zelienople Boro	3.6	Overflow	CSR-active, USGS-complete SCS-active		Yes	Connoquenessing Cr.
WASHINGTON COUNTY						
Bentleyville Boro	2.7	Overflow	CFPI-complete	CE-unfeasible (59)	No	Pigeon Cr.
California Boro	6.6	Overflow	CFPI-complete, State-complete		Yes	Monongahela R.
Canonsburg Boro	11.4	Overflow	CSR-complete, USGS-complete SCS-pending	CE-active, State-active	Yes	Chartiers Cr.
Centerville Boro	4.2	Overflow	CFPI-complete		Yes	Monongahela R.
Charleroi Boro	6.7	Overflow	CFPI-complete		Yes	Monongahela R.
Donora Boro	8.8	Combination	CFPI-complete		Yes	Monongahela R.
McDonald[2] Boro	2.9	Combination			No	Robinson Run
Meadowlands-McGovern Uninc	3.6	Overflow			No	Chartiers Cr.
Monongahela City	7.1	Overflow	CFPI-complete	Flood insurance eligibility approved	Yes	Monongahela R., Pigeon Cr.
New Eagle Boro	2.5	Overflow	CFPI-complete		Yes	Monongahela R.
Washington City	19.8	Overflow	CSR-complete, State-complete SCS-active	CE-constructed (62)	Yes	Chartiers Cr.
Washington West Uninc.	3.3	None			No	Chartiers Cr.

Place Name	Population (thousands)	Type of problem	Status of flood studies	Status of flood protection	Flood warning	Major river or stream
WESTMORELAND COUNTY						
Arnold City	8.2	Overflow			Yes	Allegheny R.
Calumet-Norvelt Uninc.	2.6	Combination				
Derry Boro	3.3	Drainage			No	
Greensburg City	15.9	Overflow		State-constructed (57, 60)	No	Jacks Run
Hempfield Twp	39.2	Overflow	CFPI-complete, State-complete		No	Sewickley Cr., Jacks Run
Irwin Boro	4.1	Overflow	CFPI-complete		No	Brush Cr.
Jeannette City	15.2	Overflow		State-constructed (54, 57)	No	Brush Cr.
Latrobe Boro	11.7	Overflow	CSR-complete, CSR-active	CE-constructed (50, 67)	No	Loyalhanna Cr., Sulfur Run
Lawson Heights Uninc.	3.8					
Lower Burrell City	13.7	Overflow	SCS-active		No	Allegheny R., Pucketa Cr.
McChesneytown-Loyalhanna Uninc.	4.3	Overflow			No	Loyalhanna Cr.
Monesson City	15.2	Overflow	CFPI-complete		Yes	Monongahela R.
Mt. Pleasant Boro	5.9	Drainage			Yes	Jacobs Cr.
New Kensington City	20.3	Overflow	CSR-pending, Local-complete, CFPI-active	Local-constructed (-), CE-pending	Yes	Allegheny R., Pucketa Cr.
North Belle Vernon Boro	2.9	Drainage	CFPI-complete		No	Monongahela R., Speers Run
North Huntingdon Twp	29.4	Overflow	CFPI-complete		No	Brush Cr.
Scottdale Boro	5.8	Overflow	SCS-active, State-active		Yes	Jacobs Cr.
South Greensburg Boro	3.3	Overflow	CFPI-complete	State-constructed (57)	No	Jacks Run
Southwest Greensburg Boro	3.2	None		State-constructed (60)	No	Jacks Run
Trafford[2] Boro	4.4	Overflow	CSR-complete	CE-constructed (67)	No	Turtle & Brush Crs.
Vandergrift Boro	7.9	Overflow			No	Kiskiminetas R.
West Newton Boro	3.6	Overflow			Yes	Youghiogheny R.
Youngwood Boro	3.1	Overflow	CFPI-complete		No	Jacks Run

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