FLOOD OF APRIL 5-7, 1984,

IN NORTHEASTERN NEW JERSEY

By Mark O. Philips and Robert D. Schopp

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FACTORS FOR CONVERTING INCH-POUND UNITS TO METRIC UNITS

For those readers who may prefer to use metric (International System) units rather than the inch-pound units used in this report, the following conversion factors may be used:

Multiply inch-pound unit	By	To obtain metric unit
	Length	
inch (in.)	25.4	millimeter (mm)
foot (ft)	.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square foot (ft^2)	.09294	square meter (m^2)
square mile (mi^2)	2.59	square kilometer (km^2)
	Velocity	
foot per second (ft/s)	.3048	meter per second (m/s)
	Volume	
million gallons (Mgal)	3,785	cubic meters (m^3)
	Flow	
cubic foot per second (ft^3/s)	.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile ($(ft^3/s)/mi^2$)	.01093	cubic meter per second per square kilometer ($(m^3/s)/km^2$)

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BY M.O. PHILIPS AND R.D. SCHOPP

ABSTRACT

This report documents hydrologic and meteorologic aspects of flooding in northeastern New Jersey and nearby New York during April 5-7, 1984. Recorded rainfall varied from 2 inches to slightly more than 8 inches within the study area. Peak stages and discharges at 46 streamflow-gaging sites are tabulated and compared to previous maximums. Thirteen gages in the Passaic River basin recorded new peaks of record. Flood-crest elevations are presented for nine stream reaches in the Passaic River basin where the most severe flooding occurred. The flooding caused 3 deaths, $250 million in property damages, and forced 6,000 people from their homes.

INTRODUCTION

Extensive flooding occurred in northeastern New Jersey on April 5, 6, and 7, 1984, as a result of 2 to slightly more than 8 inches of rainfall combined with snowmelt and saturated soil conditions. The most severe flooding occurred in the Passaic River basin. Figure 1 shows the locations of 46 selected stream-gaging sites in the flood-affected area of the Hackensack and Passaic River basins. Thirteen streamflow gaging stations, all located in the Passaic River basin, recorded new maximums of discharge or stage.

The lives of two elderly women were lost when their bungalow in Wayne, New Jersey, became inundated by flood waters from the Pompton River. The body of a third victim was found in Dover, New Jersey along the Rockaway River, after the flood waters started to recede. Property damage was estimated at $250 million, and as many as 6,000 residents had to evacuate their homes (New York Times, April 25, 1984). Passaic, Bergen, Morris, and Essex Counties were declared federal disaster areas by President Reagan. Other areas reporting flood damages were Somerset and Sussex Counties in New Jersey and Westchester, Rockland, Orange, Ulster, and Sullivan Counties in nearby New York.

This report was prepared by the U.S. Geological Survey in cooperation with the New Jersey Department of Environmental Protection, Division of Water Resources.

Purpose and Scope

The purpose of this report is to document the important hydrologic and meteorologic aspects of the flood of April 5-7, 1984. More than 170 flood-crest elevations for nine stream

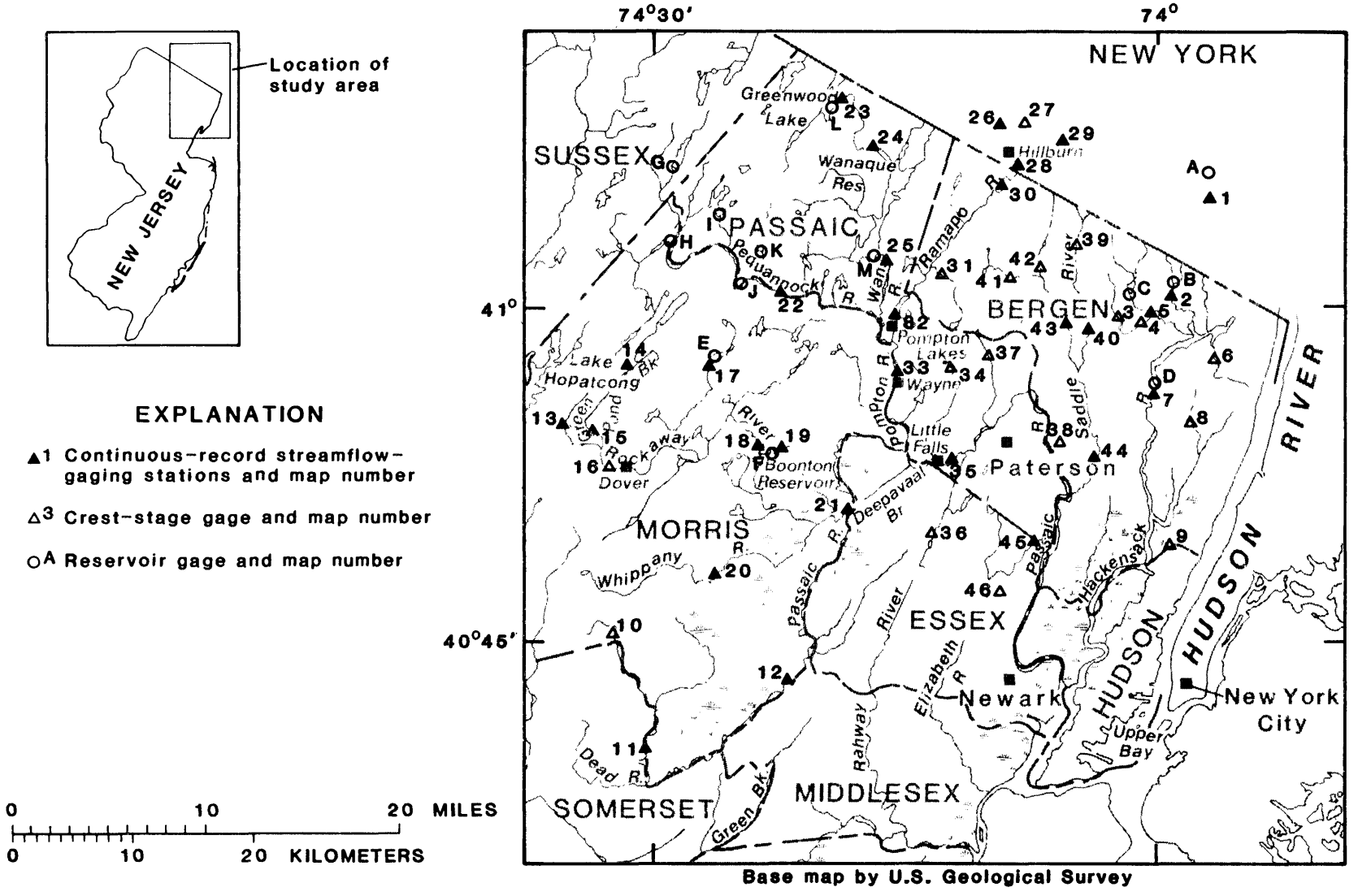


Figure 1.--Streams in the flood-affected area of northeastern New Jersey and nearby New York and locations of gaging sites and reservoirs.

reaches in the Passaic River basin are tabulated in this report. The streams surveyed include the Passaic River, Rockaway River, Green Pond Brook, Bear Swamp Brook, Pequannock River, Wanaque River, Ramapo River, Deepavaal Brook and the Pompton River. Additional high-water elevations are given for points on streams where gaging is done.

Acknowledgments

Valuable assistance was provided by the New Jersey Geological Survey who supplied benchmark elevations and descriptions. The National Oceanic and Atmospheric Administration (NOAA) furnished precipitation data.

DESCRIPTION OF STUDY AREA

The Passaic and Hackensack River basins cover 950 and 202 square miles, respectively, of which 85 and 69 percent, respectively, are in New Jersey, with the remainder in New York. These two basins are the most urbanized major river basins in New Jersey.

The Passaic River basin consists of three distinct topographic sections. The northwestern half or the Highlands section is a rural mountainous area with many lakes, mountains, and narrow valleys. The central section is the bed of ancient glacial Lake Passaic. This area is fairly flat, with extensive swamps and flood prone meadows. The third section is the lower valley where the Passaic River is generally flat with abrupt drops at several dams and the Great Falls at Paterson, New Jersey. Most of the tributaries in the lower section have steep gradients (U.S. Army Corps of Engineers, 1972).

The Hackensack River basin lies in the glaciated section of the Piedmont physiographic province of the Appalachian Highlands. Most of the bedrock in the basin consists of sedimentary rocks, with some intrusions of diabase rock, and is overlain by unconsolidated deposits of boulders, sand, gravel, and clays (Carswell, 1976).

FLOODING HISTORY OF STUDY AREA

Flooding has been a problem in the Passaic and Hackensack River basins since colonial times. For most major streams in the study area, the flood of record occurred in October 1903. Flooding also occurred in 1810, 1882, 1902, 1917, 1936, 1938, 1945, 1951, 1955, 1960, 1968, 1971, 1973, 1975, 1977 and 1979 (U.S. Army Corps of Engineers, 1972).

The storm of October 7-12, 1903, caused one of the worst floods in the history of the Passaic River basin. This storm followed 3 months of excessive rainfall, which left the ground

saturated. The maximum rainfall recorded was 15.5 inches in Paterson, New Jersey. The average rainfall over the Passaic River basin was 11.4 inches. (U.S. Army Corps of Engineers, 1972).

Flood damage tends to be greatest in the central section of the Passaic River basin followed by flood damages in the lower section. The lower section has flooding problems because of extensive development along the streams. The upper section has only limited flood problems because of the narrowness of the flood plains. Flood flows to the lower section from the "flashy" streams in the upper section are attenuated by the natural storage in the central section. The central section has had repeated flooding problems because of extensive development in the flood plains, the amount of lowlands and meadowlands, and the flat stream slopes.

METEOROLOGIC AND HYDROLOGIC CONDITIONS

Antecedent Conditions

Precipitation in each of the months from October 1983 through March 1984 (excluding January 1984) totaled 2.3 inches or more above normal in northern New Jersey (National Oceanic and Atmospheric Administration, 1984a and b). As a result of the above-average precipitation, area lakes and reservoirs were at above average levels, soils were saturated, and some parts of northeastern New Jersey experienced minor flooding in December 1983 and February 1984.

Coastal Storm of March 29 and 30, 1984

On March 29 and 30, a storm with near-hurricane-force winds snow, sleet, and rain (total water equivalent of 1.5 to 2 inches), swept across much of New Jersey and New York (table 1) (National Oceanic and Atmospheric Administration, 1984e). Tidal flood levels from the storm were generally the highest since 1962 along the coastal areas of New Jersey. The major coastal storm of March 29 and 30 left as much as 8 inches of wet snow cover over parts of interior New Jersey and 9 inches in parts of southeastern New York (table 2).

Storm of April 4-6, 1984

On April 4-6, a major storm deposited from 2 to slightly more than 8 inches of rain over most of northeastern New Jersey. The majority of the precipitation fell in a 24-hour period. The storm passed through the Ohio Valley and reached New Jersey on April 4, picked up intensity before dawn on April 5, and ended early the next day (National Oceanic and Atmospheric Administration, 1984f). Daily precipitation for March 21 to April 8, 1984, is tabulated for selected sites in table 1. The location of rainfall measurement sites and isohyets of total precipitation for April 4-6, are shown on figure 2.

Table 1.— Daily precipitation (inches) for selected sites in northern New Jersey and nearby New York, March 21 - April 8, 1984. See figure 2 for station locations.

STATION		March											April								
		21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	4-7
Belvidere (Bridge)	D		0.20	T	T				0.06	1.28	0.88						1.73	0.55	T		2.28
Blackwells Mills	D		.32	0.02			0.05		.15	1.78	.92	T					1.84	.40			2.24
Boonton 1 SE	D	0.03	.69	T					.02	1.93	.59	T					2.62	.85			3.47
Bound Brook 2 W	D		.25						.10	1.86	.68						2.30	.39			2.69
Canistear Reservoir	D	.03	.45	.04	T				.06	1.83	.47	0.01					4.15	1.18			5.33
Canoe Brook	D	T	.43	T	T		.02		.03	2.20	1.08	.01					3.50	.72			4.22
Charlotteburg Res.	D	.03	.66	.02					.03	1.90	.85	T					3.06	1.28			4.34
Charlotteburg Res.	R	*	*	*	*	*	*	*	*	*	*	*	*	3.70	*	1.40	4.70				6.10
Cranford	D	.44				.11			.79	1.68						.46	3.07				3.53
Dobbs Ferry NY	D	.16	T	.02		T			.25	1.55	.06	.03				.20	5.34	.01			5.55
Essex Fells Serv Bldg	D		.84							-							6.60	1.60			8.20
Flemington	D	.17		T		.01	.04		.30	2.33	.49						1.90	.49			2.39
Gardnerville NY	D		.35	.04					.05	2.50	.41						1.60	.66			2.26
Greenwood Lake	D	.01	.45	T					.03	1.05	1.43	T					3.07	2.20			5.27
Lambertville	D	.19	T	T		.07	.01		1.13	1.86	.03	.01				.21	2.05	.10			2.36
Little Falls	D	.01	.43	T					.01	1.34	1.76	.76					3.98	1.36			5.34
Long Valley	D		.45		0.04				.14	.96	.83	.03					2.60	1.25			3.85
Mahwah	D	.02	.31	T						1.76	.54	.04					3.40	2.40			5.80
Midland Park	D	.26	T	.02					.62	1.30	.01	.01				1.02	4.35				5.37
Morris Plains 1 W	D	.02	.75	.03	T		T		.10	1.93	.42	T				T	3.38	.63	T		4.01
Newark WSO AP	R	.23	T	.01		.06			.86	2.20	.02	T				1.82	2.07				3.89
New Brunswick	R	.37							1.06	1.76						.90	1.14				2.04
New Milford	D	.11							.46	1.30	.02					.88	2.88				3.76
Newton St Paul's Abbey	D	.01	.36	.18	T	T			.09	.95	.50	T					1.66	.57	0.01		2.24
New York Cntrl Pk WSO Cl	NY D	.05		.01		.04			.57	2.03	.01	T				1.61	2.76				4.37
NY Westerleigh Staten Is	NY D	.19				.03	.08		T	1.58	.26	.03				.37	2.81		T		3.18
Oak Ridge Reservoir	D	.03	.48	.04	.03				.05	1.92	.86	T					3.77	1.16			4.93
Plainfield	D	.28		.02		.03			.40	1.74	.10					.20	2.35				2.55
Pleasantville NY	D	-	-	-	-	-	-	-	-	-	-	-				2.9	3.02	.01			5.96
Pottersville 2 NNW	D						.06			1.48	.85						2.70	.70			3.40
Rahway	D	.05	.43	.03						1.30	.23						1.92	.88			2.80
Rahway	R	.42				.44		.05		.73	.77						1.04	.54			1.58
Ringwood	D	T	.29	T					.60	1.78	.42					.46	3.69				4.15
Scarsdale NY	D	.15								.54	1.34					1.13	3.22				4.35
Somerville 3 NW	D	.02	.29	.08			.05		.15	1.90	.96	.02	T				2.10	.39			2.49
Split Rock Pond	D	.03	.69	T					.03	1.92	.59	T					2.65	1.48			4.13
Springfield	R	.10							.73	2.02							1.99	1.84			3.84
Sussex 1 SE	D	T	.24	.02					.09	.97	.53					.02	1.59	.73			2.34
Watchung	R	.20				.30			1.10	1.70							1.65	1.84			3.49
Wanaque Raymond Dam	D	T	.40	T					T	1.84	.74						2.67	1.48			4.15
Wanaque Raymond Dam	R	*	.40						*	*	2.58						.60	1.30			1.90
Wertsville	D		.13				.03		.20	2.49	.25						2.72	.32			3.04
West Wharton	D		.45	.17					.08	.57	.26	T					3.24	1.10			4.34
Woodcliff Lake	D	.15							.40	1.46	.13					.45	3.70				4.15
Yorktown Heights 1 W	D	.02	.20	T					T	.85	.60	.01					1.94	2.89	.01		4.84

T Trace
D Raingage read once daily
R Amounts from a recording gage
* Data distribution unknown. First Value that follows is total accumulated amount
- No record
Station Names: Name of the city, town, or locality. Figures and letters following the station names indicate the distance in miles and direction from the post office or town community center.
Data supplied by National Oceanic and Atmospheric Administration.

Table 2.-- Snowfall and snow on ground (inches) for selected sites in northern New Jersey and nearby New York, March 23 - April 7, 1984. See figure 2 for station locations.

STATION		March									April						
		23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
Belvidere (Bridge)	Snowfall							T									
	Snow on ground																
Canoe Brook	Snowfall	T	T		T			6.8	1.3	T							
	Snow on ground	T	T		T			7	8	7	6	4	T				
Dobbs Ferry, NY	Snowfall	T					0.6	5.3	.3	T							
	Snow on ground						1	4	2								
Flemington	Snowfall	T						6.0									
	Snow on ground							6	5	4	T	T					
Lambertville	Snowfall	T					1.0	1.0									
	Snow on ground						1	2	T								
Long Valley	Snowfall							3.0	3.0								
	Snow on ground	-	-	-	-	-	-	-	-	-							
Morris Plains 1 W	Snowfall	T	T		T			3.5	4.0	T							
	Snow on ground							4	4	3	T						
Newark WSO AP	Snowfall	T		T			1.1	2.4	T								
	Snow on ground							1	3	1	T						
Newton St. Paul's Abbey	Snowfall	0.5	T					4.0	4.0	T							
	Snow on ground	1						4	8	6	3	1	T				
New York Central Pk WSO Cl, NY	Snowfall			T			1.5	1.8	T	T							
	Snow on ground							2	2	T							
Plainfield	Snowfall	T					2.0	4.0									
	Snow on ground						2	6	4	-							
Rahway	Snowfall						3.0										
	Snow on ground																
Somerville 3 NW	Snowfall	T						2.8	2.5								
	Snow on ground							3	4	3							
Yorktown Heights 1 W NY	Snowfall	T						6.5	4.5								
	Snow on ground	T						7	9	6	4	2	1				

Snowfall: Includes snow and ice
Snow on ground: Snow on ground, includes snow, sleet, ice, and hail
T Trace
- No record
Station Names: Name of the city, town, or locality. Figures and letters following the station names indicate the distance in miles and direction from the post office or town community center.
Data supplied by National Oceanic and Atmospheric Administration.

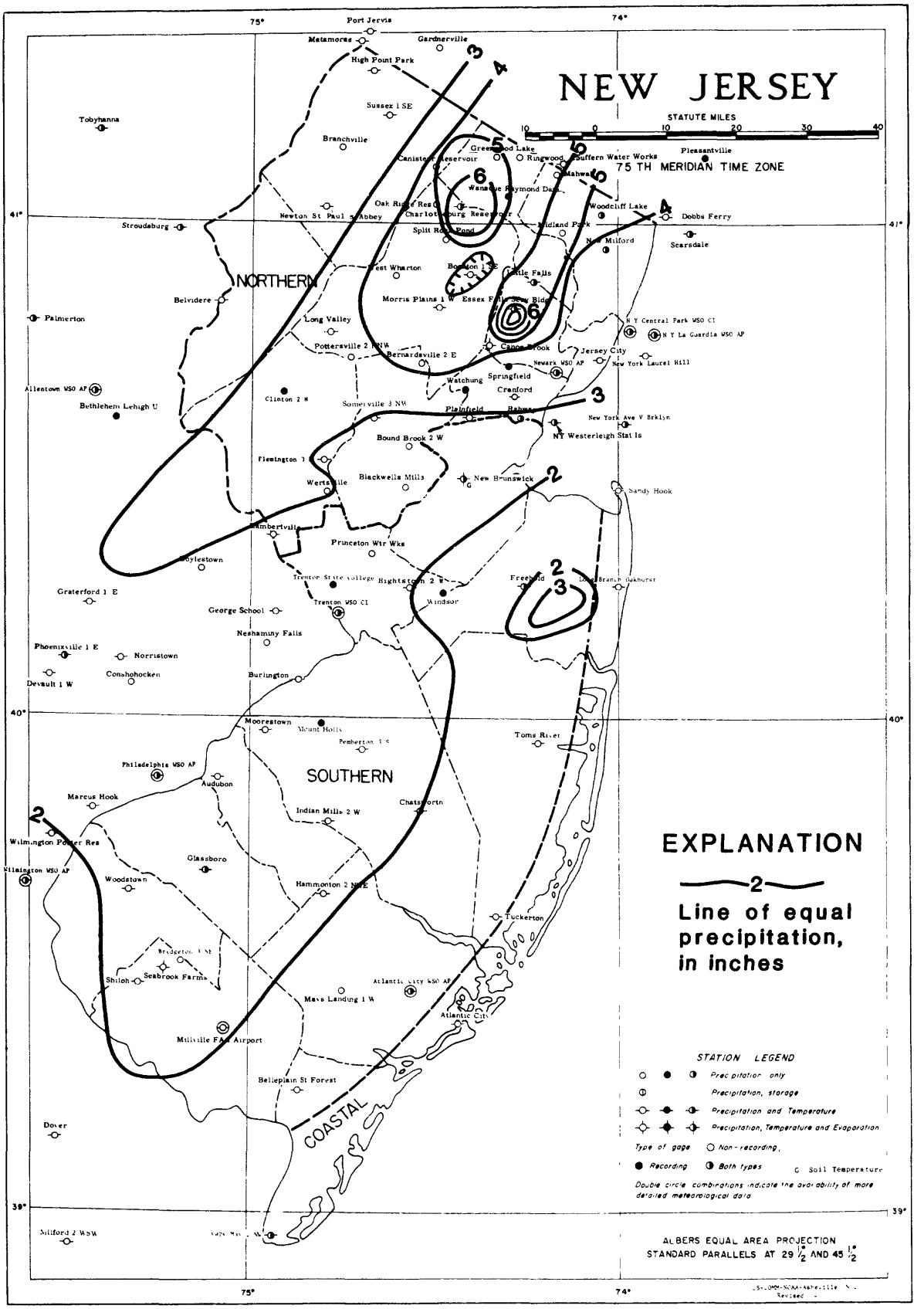


Figure 2.--Rainfall measurement sites and isohyets of total precipitation, April 4-6, 1984, for New Jersey and nearby New York.

Climatological data published by National Oceanic and Atmospheric Administration (1984a and b) indicated that most of the snow cover from the previous storms was melted by April 3; however, unofficial observations of some snow in northern New Jersey were made the day before the storm (J.C. Riley, U.S. Army Corps of Engineers, oral commun., 1985).

The maximum precipitation for the storm was 8.2 inches, recorded at Essex Fells Service Building. All other gages recorded 6.1 inches of rain or less during the storm. Based on U.S. Weather Bureau Technical Paper 29 (1958), the maximum daily rainfall of 6.6 inches recorded at the Essex Fells Service Building, April 5, had a recurrence interval of 40 years. The second greatest recorded 24-hour rainfall in the basin was 5.8 inches at Charlotteburg Reservoir, with a recurrence interval of 20 years, according to U.S. Weather Bureau Technical Paper 29 (1958). One-hour rainfall intensities had less than 2-year recurrence intervals (National Oceanic and Atmospheric Administration, 1984c, 1984d).

FLOOD OF APRIL 5-7, 1984

General Description

The flood of April 5-7, 1984, was one of the worst floods in recent history in northern New Jersey. Many long-time residents of the flood-affected areas stated that this flood was the worst they had seen in 35 to 50 years. Flood-crest elevations found along the Wanaque and Ramapo Rivers exceeded predicted 100-year flood elevations. The flood elevations on other streams in the Passaic River basin had a probability of exceedence that ranged from less than 0.01 to greater than 0.99 (recurrence intervals ranged from less than 1.1 to greater than 100-years). A total of 13 sites on streams in the Passaic River basin recorded new record peaks. The New Jersey communities of Wayne, Lincoln Park, Little Falls, and Fairfield were among the hardest hit. Also hard hit were the communities of Pompton Plains, Pompton Lakes, Paterson, and Riverdale.

Although the rainfall of April 4-6 was the major cause of the flood, it was the occurrence of the storm the week before (March 29, 30) that set the stage for the severe flooding. This storm deposited up to 8 inches of wet snow cover over much of interior northern New Jersey. The snowmelt that followed saturated the soil and raised the stages of numerous lakes and reservoirs. The saturated soil conditions prevented the precipitation of April 4-6 from infiltrating into the soil, which resulted in a large volume of runoff.

Flood damages were extensive in most of the Passaic River basin's lowlands. As a result of the many meadowlands and freshwater-swamp areas, much of the flood waters did not significantly recede until almost a week after their initial peaks.

As is commonplace after a disaster of this magnitude, some residents of the flood-affected areas looked for somebody to blame for the flood. One possibility reported by many area newspapers concerned the operation of Wanaque Reservoir--a water-supply reservoir located on the Wanaque River in Wanaque, New Jersey. It was alleged that the flood gates of the reservoir were opened during the storm, sending a tremendous amount of water downstream. This factor can be ruled out because, at the time of the flood, the reservoir had no flood gates to open (U.S. Army Corps of Engineers, 1978). Another event of disputed significance during the flood, was the reported failure of a small dam, that generally was reported to have taken place in Hillburn, New York. Correspondence with local officials revealed that a break did occur at the Ramapo Dam--a low run-of-the-river dam, which is located about 1 mile upstream of the Hillburn Dam. The flood wave that resulted was not discernable on the stage hydrograph for the U.S. Geological Survey stream-gaging station, 01387400 Ramapo River at Ramapo, New York, located 600 feet downstream from the dam at Ramapo, New York (see station data at end of text). Therefore, the dam break can be ruled out as a significant contributor to flooding.

Figure 3 shows the flood hydrograph for the Pompton River at Pompton Plains, New Jersey, along with hydrographs for three major tributaries. Examination of these hydrographs shows how the flood waters combined to produce this flood event. The Wanaque River flows into the Pequannock River, which joins the Ramapo River to form the Pompton River. The Pequannock, Wanaque, and Ramapo gages are about 12 mi, 7.4 mi, and is 2.4 mi upstream from the Pompton Plains gage, respectively.

Figure 4 shows the flood hydrographs for the Passaic River near Chatham, New Jersey, two major tributaries (the Pompton, and Rockaway Rivers), and the Passaic River flow at Little Falls, New Jersey. This plot shows the slow rise of the Passaic River and the recession that resulted from the storage in the lowlands and swamplands in this section of the Passaic River basin. The hydrographs in figures 3 and 4, show that the Pompton River rose more quickly, and receded much faster than the Passaic River. The Passaic River is fed by the flow from the Pompton River at Two Bridges, New Jersey.

Table 3 summarizes the pertinent information on peak stages and discharges during April 5-7, 1984, for gaging stations in the Hackensack and Passaic River basins. For comparative purposes, similar information on previously recorded maximums also is included.

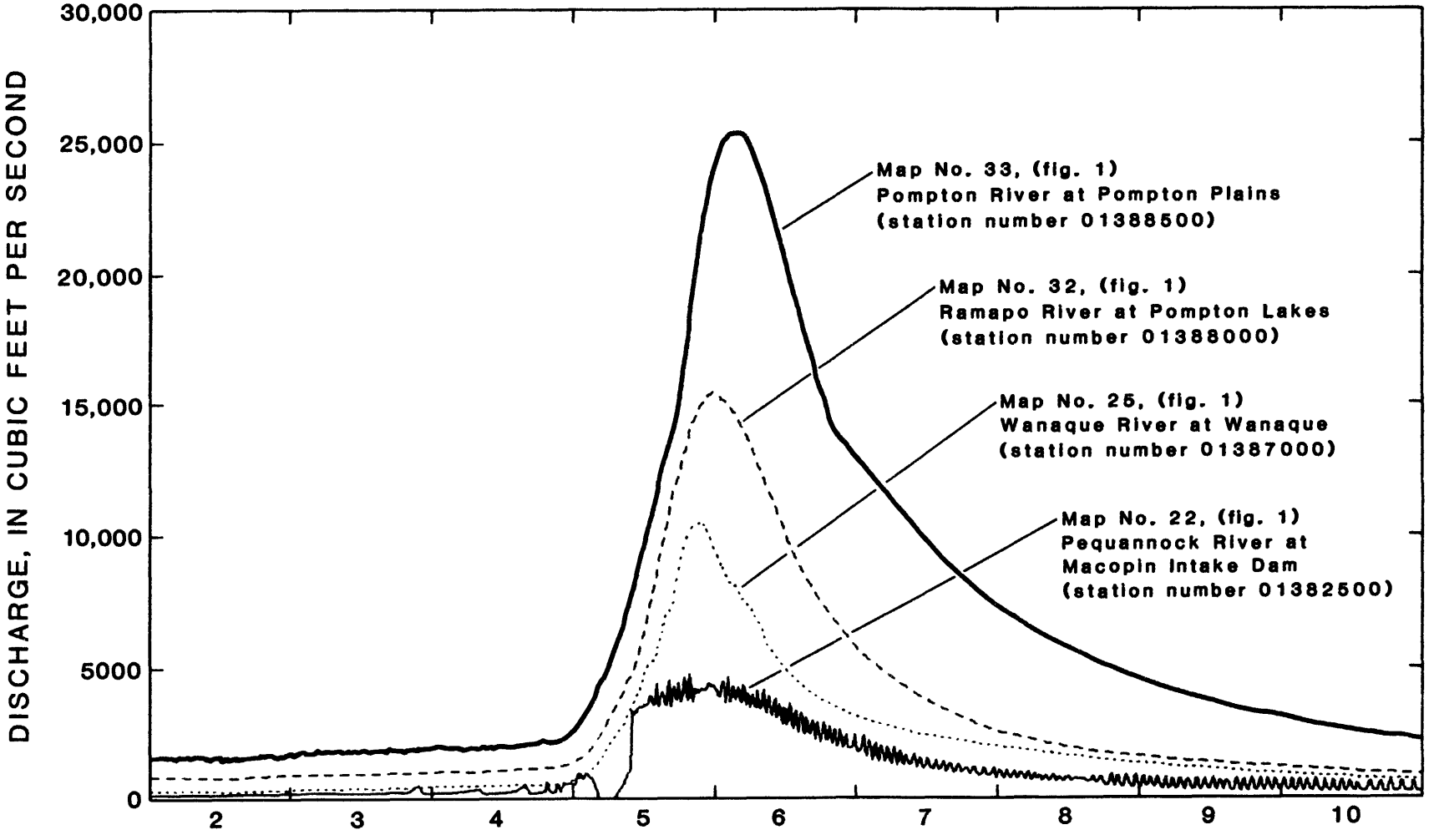


Figure 3.--Discharge hydrographs for the Pompton River and its major tributaries.

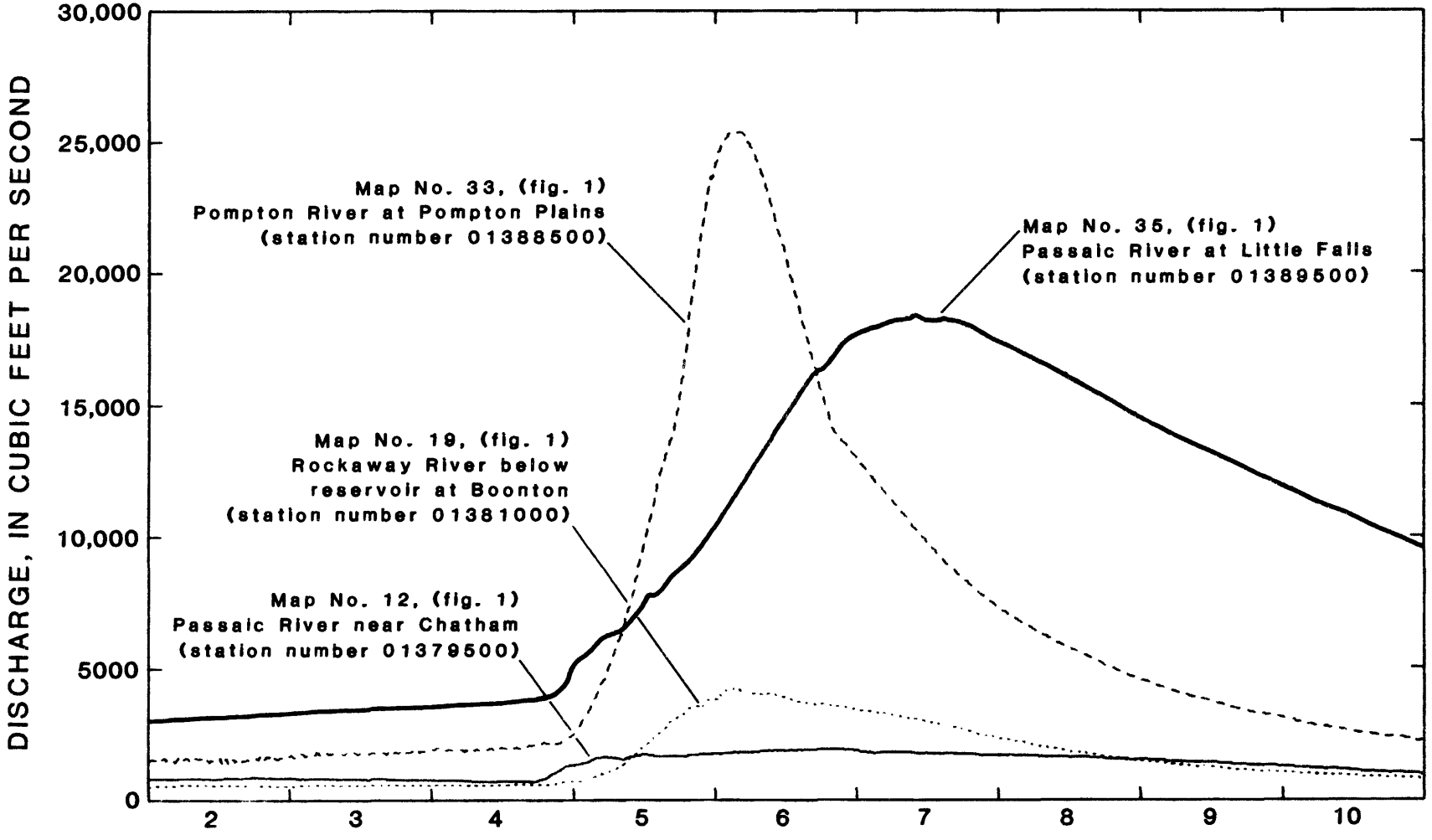


Figure 4.--Discharge hydrographs for the Passaic River and two of its major tributaries.

Table 3.-- Summary of flood data and discharge, April 5-7, 1984.

Map No.	Permanent station number	Stream and place of determination	Drainage area (mi^2)	Lakes & swamps (%)	Maximum flood previously known: Period (water years)	Maximum flood previously known: Date	Maximum flood previously known: Gage height (ft)	Maximum flood previously known: Peak discharge (ft^3/s)	Maximum during April 5-7, 1984: Day	Maximum during April 5-7, 1984: Time	Maximum during April 5-7, 1984: Gage height (ft)	Maximum during April 5-7, 1984: Peak discharge (ft^3/s)	Maximum during April 5-7, 1984: Peak discharge ($ft^3/s/mi^2$)	Annual probability of exceedence
		HACKENSACK RIVER BASIN												
01	01376800	Hackensack River at West Nyack, NY	29.4	5.0	1959-84	2-03-73	a9.38	1,550	5	b1800	a10.46	1,420	48.3	0.041
02	01377000	Hackensack River at Rivervale, NJ	58.0	4.1	1942-84	9-27-75	7.15	2,160	6	0100	6.95	2,080	35.9	.046
03	01377475	Musquapsink Brook near Westwood, NJ	2.12	2.3	1965-84	11-08-77	3.99	1,060	-	----	no peak recorded			>.95
04	01377490	Musquapsink Brook at Westwood, NJ	6.53	5.5	1966-84	11-08-77	2.09	460	5	----	1.57	280	42.9	.29
05	01377500	Pascack Brook at Westwood, NJ	29.6	2.7	1935-84	9-12-71	7.57	2,440	5	2230	4.57	903	30.5	.38
06	01378385	Tenakill Brook at Closter, NJ	8.56	0	1965-84	11-08-77	4.68	920	5	----	3.72	665	77.7	.25
07	01378500	Hackensack River at New Milford, NJ	113	4.1	1922-84	11-09-77	7.95	4,500	5	2315	7.96	4,500	39.8	.033
08	01378590	Metzler Brook at Englewood, NJ	1.54	0	1965-84	11-08-77	2.84	470	5	----	1.55	94	61.0	>.99
09	01378615	Wolf Creek at Ridgefield, NJ	1.18	0	1965-84	9-09-81	6.88	652	5	----	3.52	248	210	.87
		PASSAIC RIVER BASIN												
10	01378690	Passaic River near Bernardsville, NJ	8.83	.9	1968-84	1-25-79	15.99	1,950	5	----	14.37	1,020	116	.36
11	01379000	Passaic River near Millington, NJ	55.4	18.1	1904-06 1922-84	1-09-05	c7.8	2,000	5	2045	8.87	1,370	24.7	.083
12	01379500	Passaic River near Chatham, NJ	100	11.2	1904-11 1938-84	8-02-73	9.36	3,380	6	1830	7.26	1,930	19.3	.17

See footnotes at end of table

Table 3.-- Summary of flood data and discharge - continued

Map No.	Permanent station number	Stream and place of determination	Drainage area (mi^2)	Lakes & swamps (%)	Maximum flood previously known: Period (water years)	Date	Gage height (ft)	Peak discharge (ft^3/s)	Maximum during April 5-7, 1984: Day	Time	Gage height (ft)	Peak discharge (ft^3/s)	($ft^3/s/mi^2$)	Annual probability of exceedence
		PASSAIC RIVER BASIN - continued												
13	01379700	Rockaway River at Berkshire Valley, NJ	24.4	---	1936, 1984	3-11-36	6.72	---	5	----	9.05	1,290*	52.9	d
14	01379773	Green Pond Brook at Picatinny Arsenal, NJ	7.65	---	1983-84	4-16-83	2.81	142	5	1045	3.51	333*	43.5	d
15	01379790	Green Pond Brook at Wharton, NJ	12.6	---	1983-84	4-16-83	4.23	445	5	2245	5.11	572*	45.4	d
16	01379845	Rockaway River at Warren St., at Dover, NJ	47.5	---	1981-84	4-16-83	5.78	1,340	6	----	7.2	2,170*	45.7	d
17	01380000	Beaver Brook at Outlet of Splitrock Pond, NJ	5.50	---	1926-84	3-12-36	2.70	126	6	e0900	e3.02	e193*	35.0	f
18	01380500	Rockaway River above reservoir, at Boonton, NJ	116	6.7	1938-84	1-25-79	7.06	5,430	5	2030	7.23	5,590*	48.2	.026
19	01381000	Rockaway River below reservoir, at Boonton, NJ	119	7.6	1904, 1906-84	10-10-03	cg7.8	g7,560	6	0400	8.17	4,260	35.8	f
20	01381500	Whippany River at Morristown, NJ	29.4	1.0	1922-84	8-28-71	a8.60	2,800	5	0445	a6.66	1,680	57.1	.087
21	01381900	Passaic River at Pine Brook, NJ	349	9.1	1904, 1979-84	10-10-03	a23.2	----	7	h1130	22.90	h8,000	22.9	.025
22	01382500	Pequannock River at Macopin Intake Dam, NJ	63.7	---	1898-84	10-10-03	17.4	6,100	5	1945	16.90	4,880	76.6	f
23	01383500	Wanaque River at Awosting, NJ	27.1	13.3	1920-84	3-22-80	6.26	2,160	5	2315	6.65	2,800*	103	.017
24	01384000	Wanaque River at Monks, NJ	40.4	9.2	1934-84	3-21-80	4.30	2,710	5	b1400	a4.84	3,100*	76.7	<.01

See footnotes at end of table

Table 3.-- Summary of flood data and discharge - continued

Map No.	Permanent station number	Stream and place of determination	Drainage area (mi^2)	Lakes & swamps (%)	Maximum flood previously known: Period (water years)	Date	Gage height (ft)	Peak discharge (ft^3/s)	Maximum during April 5-7, 1984: Day	Time	Gage height (ft)	Peak discharge (ft^3/s)	($ft^3/s/mi^2$)	Annual probability of exceedence
		PASSAIC RIVER BASIN - continued												
25	01387000	Wanaque River at Wanaque, NJ	90.4	10.0	1913-15, 1919-84	3-31-51	9.12	8,470	5	2115	10.82	10,500*	116	----
26	01387400	Ramapo River at Ramapo, NY	86.7	---	1980-84	3-22-80	9.89	5,080	5	1830	13.82	10,700*	123	d
27	01387410	Torne Brook at Ramapo, NY	2.60	---	1960, 1962-84	11-08-77	11.02	1,520	5	----	8.10	900	346	.09
28	01387420	Ramapo River at Suffern, NY	93.0	---	1980-84	3-22-80	11.1	5,160	5	1930	15.38	12,300*	132	d
29	01387450	Mahwah River near Suffern, NY	12.3	5.5	1959-84	11-08-77	9.91	1,840	5	1530	7.49	1,310	107	.10
30	01387500	Ramapo River near Mahwah, NJ	120	4.6	1904-14, 1923-84	10-09-03	c11.0	12,400	5	1945	13.35	15,500*	129	.013
31	01387880	Pond Brook at Oakland, NJ	6.76	8.8	1968-71, 1976-84	5-29-68	11.64	1,300	5	----	3.05	685	101	.22
32	01388000	Ramapo River at Pompton Lakes, NJ	160	4.8	1922-84	3-12-36	c3.56	12,300	5	2330	15.21	15,400*	96.2	.015
33	01388500	Pompton River at Pompton Plains, NJ	355	6.4	1904, 1941-84	10-10-03	c14.3	28,340	6	0230	24.47	25,400	71.5	.20
34	01389030	Preakness Brook near Preakness, NJ	3.24	---	1979-84	9-06-79	5.82	1,280	5	----	4.39	680	210	d
35	01389500	Passaic River at Litle Falls, NJ	762	8.6	1898-84	10-10-03	---	31,700	7	0930	12.91	18,400	24.1	.025
36	01389534	Peckman River at Ozone Avenue, at Verona, NJ	4.45	---	1979-84	9-06-79	5.09	1,940	5	----	3.55	780	175	d

See footnotes at end of table

Table 3.-- Summary of flood data and discharge - continued

Map No.	Permanent station number	Stream and place of determination	Drainage area (mi^2)	Lakes & swamps (%)	Maximum flood previously known: Period (water years)	Date	Gage height (ft)	Peak discharge (ft^3/s)	Maximum during April 5-7, 1984: Day	Time	Gage height (ft)	Peak discharge (ft^3/s)	($ft^3/s/mi^2$)	Annual probability of exceedence
		PASSAIC RIVER BASIN - continued												
37	01389765	Molly Ann Brook at North Haledon, NJ	3.89	---	1979-84	9-06-79	8.66	1,730	5	----	8.27	1,280	329	d
38	01389900	Fleischer Brook at Market Street, at Elmwood Park, NJ	1.37	.2	1967-84	11-08-77	6.47	470	5	----	1.99	114	83.2	.94
39	01390450	Saddle River at Upper Saddle River, NJ	10.9	1.9	1966-84	11-08-77	5.25	4,150	5	----	4.47	1,700	156	.38
40	01390500	Saddle River at Ridgewood, NJ	21.6	4.6	1955-84	11-08-77	12.25	4,650	5	1645	6.80	1,560	72.2	.22
41	01390810	Hohokus Brook at Allendale, NJ	9.11	.7	1969-84	11-08-77	8.28	1,380	5	----	6.86	800	87.8	.18
42	01390900	Ramsey Brook at Allendale, NJ	2.55	.1	1975-84	11-08-77	5.39	980	5	----	3.44	375	147	.45
43	01391000	Hohokus Brook at Ho-Ho-Kus, NJ	16.4	5.5	1954-84	11-08-77	7.06	3,700	5	1600	5.26	2,570	157	.060
44	01391500	Saddle River at Lodi, NJ	54.6	4.0	1924-84	11-09-77	a12.36	4,500	5	----	a9.51	3,350	61.4	.067
45	01392210	Third River at Passaic, NJ	11.8	---	1977-84	11-08-77	8.25	2,300	5	1515	4.90	829	70.3	.65
46	01392500	Second River at Belleville, NJ	11.6	.9	1938-84	8-28-71	9.8	6,500	5	----	4.74	1,400	121	.81

a From floodmarks
b About
c Site and (or) datum then in use
d Insufficient record to perform probability analysis
e Once daily staff-gage reading
f Probability curve not computed due to significant regulation
g Daily mean
h Peak discharge may not have occurred same time as maximum gage height due to variable backwater
* Peak of record
- Not determined

Flood Probabilities

Flood-probability estimates, which provide a convenient method of assessing the severity of an observed flood, are shown in the last column of table 3. These probabilities indicate the likelihood of exceeding a specific flood in any future year. For example, on the Hackensack River at West Nyack, N.Y., (line 1 of table 3), a discharge of 1,420 cubic feet per second is estimated to have a 4.1 percent chance of being exceeded, or a 95.9 percent chance of not being exceeded in any future year. Recurrence interval is another way to express flood probabilities. Recurrence interval in years is equal to the reciprocal of the annual probability of exceedance or, in the case of the Hackensack River at West Nyack, 24 years.

Flood probabilities in table 3 were computed only for sites having 10 or more years of annual flood-peak record and where the flood flow is considered natural or only moderately affected by artificial regulation. Computations followed guidelines of the U.S. Water Resources Council (1981). Flood magnitude and frequency for stations with short or no gaging records may be evaluated on the basis of flood magnitude and frequency equations developed by Stankowski (1974).

Reservoir Stage and Content

The storage of flood waters in reservoirs can significantly reduce the magnitude of peak flood-flows at downstream sites. The volume of flood water stored in selected reservoirs in the Hackensack and Passaic River basins are listed in table 4 for the period March 30 through April 8, 1984. Map numbers correspond to those on the location map (fig. 1). More information about these reservoirs is contained in the annual data reports of the U.S. Geological Survey.

Figure 5 shows the attenuation effect on the flood flow as it passed through Boonton Reservoir. A 24-percent reduction in the peak discharge occurred even though the Reservoir was spilling at the beginning of the flood. Using the method described by McCall (1967), the total inflow for Wanaque Reservoir was computed to be at least 15 percent higher than the outflow.

Table 4.-- Summary of once-daily stages (feet above sea level) and contents (million gallons) of selected reservoirs in the Hackensack and Passaic River basins from March 30-April 8, 1984.

Map No.	Reservoir Name / Station No.		March 30	March 31	April 1	April 2	April 3	April 4	April 5	April 6	April 7	April 8	Spillway crest
HACKENSACK RIVER BASIN													
A	De Forest Lake	feet*	85.31	85.37	85.39	85.37	85.32	85.35	85.75	85.46	85.42	85.41	80.00
	013765700	million gal	5,772	5,792	5,799	5,792	5,775	5,785	5,919	5,822	5,809	5,805	4,068
B	Lake Tappan	feet*	55.40	55.40	55.39	55.39	55.38	55.40	55.65	55.56	55.42	55.38	55.00
	01376950	million gal	3,997	3,997	3,993	3,993	3,989	3,997	4,088	4,055	4,004	3,989	3,378
C	Woodcliff Lake	feet*	<67.60	<67.60	<67.60	<67.60	<67.60	<67.60	<67.60	<67.60	<67.60	<67.60	94.33
	01377450	million gal	0	0	0	0	0	0	0	0	0	0	835
D	Oradell Reservoir	feet*	23.45	23.52	23.53	23.50	23.42	23.46	24.49	23.89	23.32	23.40	23.16
	01378480	million gal	3,586	3,606	3,608	3,600	3,578	3,589	3,884	3,710	3,550	3,572	3,267
PASSAIC RIVER BASIN													
E	Splitrock Res.	feet**	835.30	835.35	835.30	835.25	835.25	835.25	836.00	836.35	836.00	835.85	835.00
	01379990	million gal	3,365	3,375	3,365	3,355	3,355	3,355	3,504	3,573	3,504	3,474	3,310
F	Boonton Res.	feet**	305.85	305.85	305.85	305.90	305.90	305.90	305.90	306.44	307.98	307.42	305.25
	01380900	million gal	7,629	7,629	7,629	7,642	7,642	7,642	7,642	7,780	8,187	8,032	7,620
G	Canister Res.	feet*	1,086.10	1,086.10	1,086.10	1,086.10	1,086.10	1,086.10	1,086.80	1,087.00	1,086.30	1,086.30	1,086.00
	01382100	million gal	2,417	2,417	2,417	2,417	2,417	2,417	2,487	2,507	2,437	2,437	2,407
H	Oak Ridge Res.	feet*	846.20	846.20	846.20	846.10	846.20	846.20	846.90	847.20	846.60	846.50	846.00
	01382220	million gal	3,924	3,924	3,924	3,909	3,924	3,924	4,025	4,068	3,981	3,967	3,895
I	Clinton Res.	feet*	992.30	992.30	992.30	992.30	992.30	992.40	993.20	993.10	992.70	992.50	992.00
	01382300	million gal	3,556	3,556	3,556	3,556	3,556	3,569	3,672	3,659	3,608	3,582	3,518
J	Charlotteburg Res.	feet*	743.40	743.30	743.30	743.35	743.40	743.40	743.50	743.55	743.50	743.45	743.00
	01382380	million gal	3,014	3,002	3,002	3,008	3,014	3,014	3,027	3,033	3,027	3,021	2,964
K	Echo Lake	feet*	893.20	893.20	893.20	893.20	893.20	893.20	893.90	894.20	893.70	893.70	880.00
	01382400	million gal	1,601	1,601	1,601	1,601	1,601	1,601	1,668	1,697	1,648	1,648	1,045
L	Greenwood Lake	feet*	619.32	619.28	619.26	619.26	619.29	619.36	620.30	621.53	620.71	620.17	618.86
	01383000	million gal	7,145	7,120	7,108	7,108	7,127	7,170	7,757	8,532	8,016	7,675	6,860
M	Wanaque Res.	feet*	302.63	302.61	302.62	302.64	302.72	302.78	303.69	304.07	303.66	303.32	300.30
	01386990	million gal	29,800	29,790	29,800	29,810	29,880	29,920	30,630	30,930	30,610	30,340	26,230

* Elevation at 0800.
** Elevation at 0900.
< Less than indicated value
a Instantaneous peak elevation, 621.81 ft, capacity, 8,719,000,000 gal
b Instantaneous peak elevation, 304.52 ft, capacity, 31,284,000,000 gal

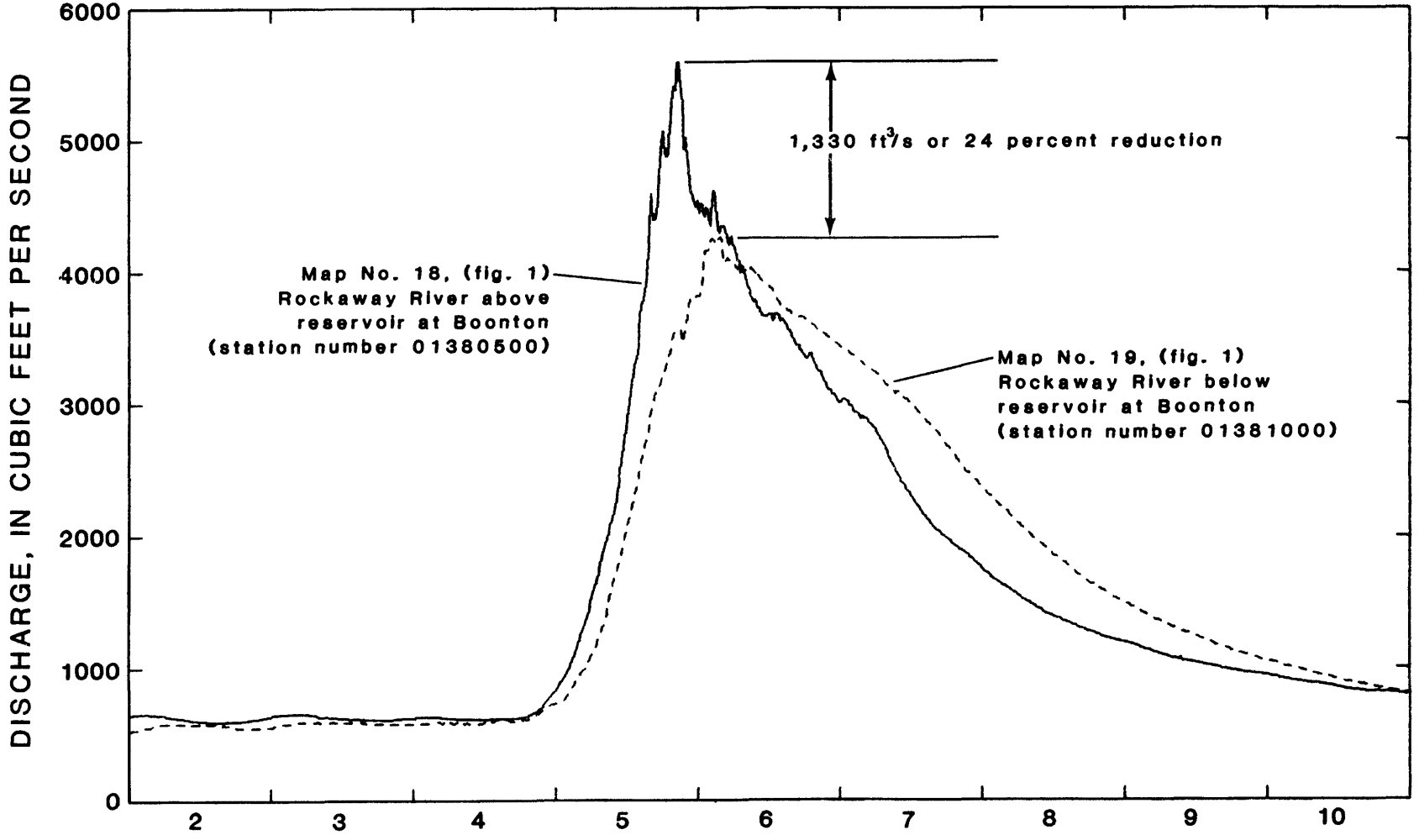


Figure 5.--Discharge hydrographs for the Rockaway River above and below Boonton Reservoir at Boonton.

Flood-Crest Elevations

Flood-profiles, constructed from flood-crest elevations are essential to the solution of a wide range of engineering and planning problems. Examples include the proper design of structures located on a flood plain, and the evaluation of flood-prone areas for land-use regulation and flood insurance rates. Water-surface profiles are affected by obstructions, contractions and expansions of the channel; relative roughness of the bed, banks, and overflow areas; changes in alignment; and the flow of tributaries. For example, an abrupt change in profile often occurs at many bridges, indicating that, under conditions prevalent at the time of the crest, the hydraulic characteristics of the bridge structure controlled the elevation of the upstream water surface to some extent. Hydraulic characteristics of the channel downstream from the bridge control the water-surface elevations below the bridge. Accumulation of debris, channel enlargement, or sediment deposits could significantly alter the drop in water surface through the bridge and may also affect the extent of flooding upstream of the bridge.

Table 5 lists flood-crest data for the April 5-7, 1984, flood for the following streams in the Passaic River basin in New Jersey: Passaic River, Canoe Brook, Rockaway River, Green Pond Brook, Bear Swamp Brook, Pequannock River, Wanaque River, Ramapo River, Mahwah River, Pond Brook, Pompton River, Preakness (Signac) Brook, Deepavaal Brook, Peckman River, Molly Ann Brook, Fleischer Brook, Dundee Canal, Second River, Third River, Saddle River, Ramsey Brook, and Hohokus Brook.

Flood-crest elevations were located and marked in the field by U.S. Geological Survey personnel within 5 days of the flood. Where possible, flood-crest elevations were marked both upstream and downstream of a controlling structure or section to show the fall present at the time of the flood. Most sites had numerous marks which were averaged, or best accuracy rated marks were used to obtain a single elevation for both the upstream and downstream side of the controlling structure or section.

The flood-crest data are tabulated in the following order:

1. Principle stream, tributary stream--in regular downstream order, with the exception that the profile data are continuous in one group for the reach of stream carrying the same name throughout. This order differs from the regular order, in which each tributary is listed in downstream order as found.

2. City or township and state--as determined from U.S. Geological Survey 7.5-minute series topographic maps.

3. Location of high-water mark--example: 100 ft downstream of bridge on Pascack Road, right bank. "Right bank" and "left bank" refer to the side of the stream as viewed when looking downstream. This specific connotation is standard in all U.S. Geological Survey reports and data collection programs.

4. Miles above mouth--river miles as measured in one-tenth-mile increments on U.S. Geological Survey 7.5 minute quadrangle topographic maps.

5. Elevation--referenced to sea level, which is equivalent to that of the New Jersey Geodetic Control Survey Datum.

SUMMARY

This report documents meteorologic and hydrologic information pertaining to northeastern New Jersey during the flood of April 5-7, 1984. This flood had recurrence intervals that ranged from less than 10 to greater than 100 years. Rainfall over the area varied from 2 to slightly more than 8 inches. The flood established 13 new peaks of record in the Passaic River basin. Water-supply reservoirs in the basin generally were full at the beginning of the storm, but an analysis of the recorded data indicates that the reservoirs considerably reduced peak discharges downstream.

Generally, the flood of October 1903, which was the worst flood on record in the Passaic River basin, was the result of an average of 11.4 inches of precipitation over the Passaic River basin. However, in some areas, the severity of the flooding of April 1984 compared to and even exceeded the 1903 flood, which had twice the precipitation. The flooding along the larger streams (drainage areas greater than 75 square miles) was, generally, the worst since 1903. Many of the smaller streams had only minor flooding.

Table 5.-- Flood-crest data, April 5-7, 1984

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN		
Passaic River:		
Bernardsville, NJ, USGS crest-stage gage 01378690, at bridge on US Route 202, downstream side, right bank	82.0	252.4
Millington, NJ, USGS continuous-record gage 01379000, 200 ft downstream from Davis Bridge, right bank	76.4	224.5
New Providence, NJ, at upstream side of Passaic Street bridge, left bank	63.5	208.2
New Providence, NJ, at downstream side of Passaic Street bridge, right bank	63.5	208.2
Chatham NJ, USGS continuous-record gage 01379500, 150 ft downstream from Stanley Avenue bridge, left bank	61.9	200.7
Chatham, NJ, 20 ft upstream of Lower Chatham Bridge (Passaic Avenue), left bank	57.9	174.3
Chatham, NJ, 15 ft downstream of Lower Chatham Bridge (Passaic Avenue), left bank	57.9	174.3
Florham Park, NJ, upstream side of Columbia Road/S. Orange Avenue bridge, right bank	54.9	173.4
Florham Park, NJ, 60 ft downstream of Columbia Road/S. Orange Avenue bridge, right bank	54.9	173.4
East Hanover, NJ, 200 ft downstream of bridge on NJ Route 10, right bank	53.2	173.2
Hanover Neck, NJ, 15 ft upstream of Swinefield Bridge, (Eagle Rock Avenue), right bank	50.4	172.5
Hanover Neck, NJ, at downstream side of Swinefield Bridge, (Eagle Rock Avenue), right bank	50.4	172.5
Pine Brook, NJ, USGS crest-stage gage 01381900, on downstream wingwall of US Route 46 bridge, left bank	47.6	172.2

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Passaic River -- continued		
Two Bridges, NJ, on upstream bridge abutment at bridge on Passaic Avenue, right bank	33.8	171.8
Two Bridges, NJ, on downstream bridge abutment at bridge on Passaic Avenue, right bank	33.8	171.6
Fairfield, NJ, 30 ft upstream of US Route 46 bridge, left bank	33.2	170.9
Fairfield, NJ, 200 ft downstream of US Route 46 bridge, left bank	33.2	168.8
Singac, NJ, 30 ft upstream of NJ Route 23 (Pompton Turnpike) bridge, right bank	31.7	168.7
Singac, NJ, 75 ft downstream of NJ Route 23 (Pompton Turnpike) bridge, left bank	31.7	168.2
Little Falls, NJ, 100 ft upstream of Beattie's Dam, left bank	30.4	164.0
Little Falls, NJ, USGS continuous record gage 01389500, 0.6 mile downstream of Beattie's Dam, left bank	29.8	133.3
Little Falls, NJ, 40 ft upstream of bridge on Lackawana Avenue, left bank	29.2	130.9
Little Falls, NJ, 30 ft downstream of bridge on Lackawana Avenue, left bank	29.2	130.9
Paterson, NJ, at upstream bridge abutment of Lincoln Street bridge, right bank	27.2	124.7
Paterson, NJ, 150 ft downstream of Lincoln Street bridge, right bank	27.2	124.7
Paterson, NJ, 5 ft upstream of Spruce Street bridge, upstream of Passaic (Great) Falls, left bank	26.1	121.2
Paterson, NJ, 40 ft upstream of Passaic (Great) Falls, downstream of S.U.M. Dam, left bank	26.1	113.3
Paterson, NJ, 80 ft upstream of the bridge on West Broadway Street, left bank	25.4	52.4

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Passaic River -- continued		
Paterson, NJ, 25 ft downstream of the bridge on West Broadway Street, right bank	25.4	49.8
Paterson, NJ, upstream of bridge on Straight Street bridge, right bank	24.8	47.7
Paterson, NJ, downstream of bridge on Straight Street bridge, right bank	24.8	47.6
Paterson, NJ, 30 ft upstream of bridge on Sixth Street, left bank	24.2	43.3
Paterson, NJ, 150 ft downstream of bridge on Sixth Street, left bank	24.2	43.2
Paterson, NJ, at upstream bridge abutment of bridge on Lincoln Avenue, left bank	23.0	40.8
Paterson, NJ, 5 ft downstream of bridge on Lincoln Avenue, left bank	23.0	40.8
Paterson, NJ, 10 ft upstream of bridge on East 33rd Street (Morlot Ave.), left bank	21.6	35.9
Paterson, NJ, 10 ft downstream of bridge on East 33rd Street (Morlot Ave.), left bank	21.6	35.9
Paterson, NJ, 50 ft upstream of N.Y.S. & W. (Erie) railroad bridge, left bank	19.7	33.8
Paterson, NJ, 240 ft downstream of N.Y.S. & W. (Erie) railroad bridge, left bank	19.7	33.3
Elmwood Park, NJ, 10 ft upstream of bridge on US Route 46, left bank	18.9	30.8
Elmwood Park, NJ, 55 ft downstream of bridge on US Route 46, left bank	18.9	30.7
Clifton, NJ, at upstream side of Dundee Dam Canal gates, right bank	18.1	30.5
Clifton, NJ, 50 ft downstream of Dundee Dam, right bank	18.1	22.1

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Passaic River -- continued		
Garfield, NJ, 30 ft upstream of bridge on Ackerman Avenue, right bank	17.7	16.3
Garfield, NJ, 15 ft downstream of bridge on Ackerman Avenue, right bank	17.7	16.3
Garfield, NJ, 10 ft upstream of bridge on Monroe Street, right bank	16.8	12.8
Garfield, NJ, 30 ft downstream of bridge on Monroe Street, right bank	16.8	12.8
Canoe Brook:		
Summit, NJ, at USGS gaging station 01379530, at Commonwealth Water Company pumping station, left bank	0.6	175.7
Rockaway River:		
Jefferson, NJ, at the downstream wingwall of bridge on eastbound NJ Route 15, left bank	30.0	693.4
Jefferson, NJ, 5 ft upstream of bridge on Berkshire Valley Road, left bank	28.6	691.8
Roxbury, NJ, 200 ft upstream of the CONRAIL railroad bridge, right bank	26.2	674.1
Roxbury, NJ, 50 ft downstream of bridge on West Dewey Avenue, right bank	26.2	672.4
Wharton, NJ, 30 ft downstream of CONRAIL railroad bridge (located downstream of Washington Pond), right bank	24.9	632.9
Dover, NJ, at USGS crest-stage gage 01379845, 100 ft upstream of Warren Street, left bank	22.7	569.0
Dover, NJ, 200 ft upstream of bridge on East Blackwell Street, left bank	22.0	561.5
Dover, NJ, 25 ft downstream of bridge on Dover-Rockaway Road, left bank	21.2	546.3

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Rockaway River -- continued		
Denville, NJ, 125 ft upstream of bridge on Savage Road, left bank	17.4	509.5
Denville, NJ, 5 ft downstream of bridge on Savage Road, right bank	17.4	509.0
Denville, NJ, 60 ft upstream of bridge on Diamond Spring Road, right bank	16.5	506.6
Denville, NJ, 10 ft downstream of bridge on Diamond Spring Road, right bank	16.5	505.3
Denville, NJ, 200 ft downstream of bridge on Boonton Road, left bank	14.1	500.7
Powerville, NJ, 100 ft upstream of bridge on North Main Street, left bank	11.4	490.8
Powerville, NJ, 75 ft downstream of bridge on North Main Street, right bank	11.4	489.7
Boonton, NJ, 100 ft downstream of bridge on Main Street, left bank	10.6	477.8
Boonton, NJ, 60 ft upstream of USGS continuous-record gage 01380500, right bank	9.9	371.9
Boonton, NJ, USGS continuous-record gage 01380500, located 1.8 mi. upstream from dam at Boonton Reservoir, right bank	9.9	371.7
Boonton, NJ, 100 ft downstream of USGS continuous-record gage 01380500, right bank	9.9	369.5
Boonton, NJ, USGS continuous-record gage 01381000, located 2000 ft downstream from Boonton Reservoir Dam, right bank	7.8	203.8
Boonton, NJ, 65 ft upstream of bridge on Greenback Road, right bank	7.4	199.0
Boonton, NJ, 80 ft downstream of bridge on Greenback Road, right bank	7.4	197.0
Pine Brook, NJ, 80 ft upstream of bridge on Vail Road, left bank	3.9	176.4

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Rockaway River -- continued		
Pine Brook, NJ, 10 ft downstream of bridge on Vail Road, left bank	3.9	176.2
Pine Brook, NJ, 100 ft upstream of bridge on Bloomfield Avenue, right bank	2.4	174.5
Pine Brook, NJ, 10 ft downstream of bridge on Bloomfield Avenue, right bank	2.4	174.3
Green Pond Brook:		
Picatinny Arsenal, NJ, 40 ft upstream of bridge on 24th Avenue, right bank	7.4	771.9
Picatinny Arsenal, NJ, 30 ft upstream of bridge on 23rd Avenue, left bank	7.1	749.1
Picatinny Arsenal, NJ, USGS continuous-record gaging station 01379773, 500 ft upstream of Picatinny Lake, left bank	6.6	716.0
Picatinny Arsenal, NJ, 200 ft upstream of bridge on Whittmore Avenue, left bank	5.4	699.0
Picatinny Arsenal, NJ, 100 ft downstream of bridge on Whittmore Avenue, right bank	5.4	698.2
Picatinny Arsenal, NJ, 220 ft downstream of bridge on 9th Street, right bank	5.2	692.3
Picatinny Arsenal, NJ, 150 ft upstream of bridge on Farley Avenue, right bank, left channel	4.7	691.3
Picatinny Arsenal, NJ, 75 ft upstream of bridge on Farley Avenue, left bank	4.7	691.2
Picatinny Arsenal, NJ, 20 ft downstream of bridge on Parker Road, left bank	4.4	690.3
Picatinny Arsenal, NJ, 60 ft upstream of bridge on First Street, right bank	4.3	689.8
Picatinny Arsenal, NJ, 10 ft downstream of railroad bridge next to First Street, right bank	4.3	689.8

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Green Pond Brook -- continued		
Picatinny Arsenal, NJ, 50 ft upstream of bridge on Shinkle Road, right bank	3.6	688.7
Picatinny Arsenal, NJ, 100 ft upstream of railroad bridge next to South Brook Road and 500 ft upstream of Building 1178, right bank	3.0	687.4
Picatinny Arsenal, NJ, 200 ft downstream of railroad bridge next to South Brook Road and 800 ft downstream of Building 1178, right bank	3.0	687.2
Picatinny Arsenal, NJ, USGS continuous-record gaging station 01379790, 600 ft upstream from bridge on NJ Route 15, left bank	2.7	684.6
Bear Swamp Brook:		
Picatinny Arsenal, NJ, 6 ft downstream of culvert located upstream of parking lot west of Reilly Road, 210 ft west of Building 106	0.8	702.5
Picatinny Arsenal, NJ, 25 ft upstream of culvert on Third Street, east of Building 60, left bank	0.4	699.2
Picatinny Arsenal, NJ, 50 ft upstream of culvert which is located next to Second Avenue and 50 ft west of Building 65, right bank	0.3	697.6
Picatinny Arsenal, NJ, 20 ft upstream of culvert which is located next to Second Avenue and 50 ft west of Building 65, left bank	0.3	696.7

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Pequannock River:		
Smiths Mills, NJ, USGS continuous-record gage 01382500, located at Macopin Intake Dam, right bank	10.1	586.9
Smiths Mills, NJ, 50 ft upstream of U-turn bridge on NJ Route 23, 0.2 mi downstream of Macopin Intake Dam, left bank	9.9	565.2
Smiths Mills, NJ, 30 ft downstream of U-turn bridge on NJ Route 23, 0.2 mi downstream of Macopin Intake Dam, right bank	9.9	558.4
Smiths Mills, NJ, 75 ft upstream of bridge on Paterson-Hamburg Turnpike, right bank	8.0	429.7
Smiths Mills, NJ, 55 ft downstream of bridge on Paterson-Hamburg Turnpike, right bank	8.0	426.4
Butler, NJ, 75 ft upstream of of bridge on Paterson-Hamburg Turnpike, left bank	7.0	367.9
Butler, NJ 60 ft downstream of bridge on Paterson-Hamburg Turnpike, right bank	7.0	365.8
Butler, NJ, 100 ft downstream of bridge on Main Street, upstream crossing, left bank	6.3	330.5
Butler, NJ, upstream of bridge on Main Street, downstream crossing, left bank	5.5	294.3
Butler, NJ, downstream of bridge on Main Street, downstream crossing, left bank	5.5	291.2
Bloomingdale, NJ, 100 ft upstream of bridge on Main Street/Riverdale Avenue, right bank	4.8	255.8
Bloomingdale, NJ, 105 ft downstream of bridge on Main Street/Riverdale Avenue, right bank	4.8	252.2
Pompton Lakes, NJ, upstream of bridge on Paterson-Hamburg Turnpike, right bank	2.9	201.5
Pompton Lakes, NJ, downstream of Paterson-Hamburg Turnpike, left bank	2.9	199.4

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Pequannock River -- continued		
Riverdale, NJ, 150 ft upstream of bridge on Riverdale Road, right bank	2.0	192.2
Riverdale, NJ, 120 ft downstream of bridge on Riverdale Road, left bank	2.0	190.7
Pompton Plains, NJ, at discontinued Upper Pompton Feeder Dam gaging station, right bank	0.3	186.4
Wanaque River:		
Awosting, NJ, USGS continuous-record gage 01383000, located in gatehouse near center of Greenwood Lake Dam	17.4	621.8
Awosting, NJ, USGS continuous-record gage 01383500, 700 ft downstream of Greenwood Lake, right bank	17.3	608.0
Monks, NJ, 90 ft upstream of bridge on Stonetown Road, right bank	11.6	321.3
Monks, NJ, 5 ft downstream of bridge on Stonetown Road, right bank	11.6	319.4
Monks, NJ, USGS continuous-record gage 01383400, 0.3 mi. downstream from bridge on Stonetown Rd., left bank	11.3	308.6
Wanaque, NJ, Wanaque Reservoir at Raymond Dam (supplied by North Jersey Water Supply Commission)	5.1	304.5
Wanaque, NJ USGS continuous-record gage 01387000, 750 ft downstream from Raymond Dam, left bank	5.0	221.7
Wanaque, NJ, 65 ft upstream of former Erie railroad bridge (located downstream of NJ Route 511), right bank	4.9	221.4
Wanaque, NJ, 30 ft downstream of former Erie railroad bridge (located downstream of NJ Route 511), right bank	4.9	220.9
Wanaque, NJ, approximately 1.2 mi downstream of Raymond Dam, at baseball field, right bank	3.8	215.1
Pompton Lakes, NJ, 200 ft upstream of dam (breached) forming Lake Inez, right bank	1.9	205.6

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Wanaque River -- continued		
Pompton Lakes, NJ, 180 ft upstream of bridge on Wanaque Avenue, right bank	1.7	204.5
Pompton Lakes, NJ, 30 ft upstream of N.Y.S. & W. railroad bridge, left bank	1.6	203.0
Pompton Lakes, NJ, 115 ft downstream of N.Y.S. & W. railroad bridge, left bank	1.6	202.7
Pompton Lakes, NJ, 40 ft upstream of bridge on Paterson-Hamburg Turnpike, left bank	1.0	197.9
Pompton Lakes, NJ, 15 ft downstream of bridge on Paterson-Hamburg Turnpike, left bank	1.0	197.0
Ramapo River:		
Ramapo, NY, USGS continuous-record gage 01387400, located 105 ft downstream of highway bridge on New York State Thruway, right bank	17.0	310.8
Suffern, NY, USGS continuous-record gage 01387420, located downstream from highway bridge on New York State Thruway, left bank	15.0	279.8
Mahwah, NJ, 80 ft upstream of bridge on NJ Route 17, left bank	13.4	268.1
Mahwah, NJ, 100 ft downstream of bridge on NJ Route 17, left bank	13.4	267.1
Mahwah, NJ, USGS continuous-record gage 01378500, 350 ft downstream of bridge on NJ Route 17, left bank	13.4	266.4
Darlington, NJ, 70 ft downstream of bridge on Halifax Road,left bank	11.3	253.2
Darlington, NJ, 75 ft upstream of bridge on road leading to Sun Valley Farm, left bank	9.6	245.0
Darlington, NJ, 100 ft downstream of bridge on road leading to Sun Valley Farm, left bank	9.6	244.6
Darlington, NJ, 30 ft upstream of bridge on Bear Swamp Road, right bank	9.2	243.9
Darlington, NJ, 40 ft downstream of bridge on Bear Swamp Road, right bank	9.2	242.8

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Ramapo River -- continued		
Oakland, NJ, 50 ft downstream of bridge on Glen Grey Road, right bank	7.7	236.7
Oakland, NJ, 50 ft upstream of bridge on Lenape Lane, left bank	6.2	227.5
Oakland, NJ, 80 ft downstream of bridge on Lenape Lane, left bank	6.2	225.8
Oakland, NJ, 100 ft upstream of bridge on West Oakland Avenue, left bank	5.3	217.9
Oakland, NJ, 100 ft downstream of bridge on West Oakland Avenue, left bank	5.3	217.1
Oakland, NJ, 4 ft upstream of bridge on Doty Road, right bank	4.1	210.1
Oakland, NJ, 5 ft downstream of bridge on Doty Road, right bank	4.1	209.5
Pompton Lakes, NJ, USGS continuous-record gage 01388000 located on dam at Pompton Lakes pumping station, right bank	1.9	206.3
Pompton Lakes, NJ, 60 ft upstream of bridge on U.S. Route 202, left bank	1.9	193.0
Wayne, NJ, 15 ft upstream of bridge on Dawes Highway, left bank	1.3	188.4
Wayne, NJ, 20 ft downstream of bridge on Dawes Highway, left bank	1.3	188.0
Pompton Lakes, NJ, 180 ft upstream of Lower Pompton Feeder Dam	0.2	185.4
Pompton Lakes, NJ, 20 ft downstream of Lower Pompton Feeder Dam	0.2	184.6
Mahwah River:		
Suffern, NY, USGS continuous-record gage 01387450, located 13 ft upstream from bridge on U.S. Route 202, left bank	4.8	329.1

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Pond Brook:		
Oakland, NJ, USGS crest-stage gage 01387880, at bridge on NJ Route 208, right bank	0.6	280.0
Oakland, NJ, downstream side of bridge on NJ Route 208, left bank	0.6	278.6
Pompton River:		
Pompton Plains, NJ, USGS continuous-record gage 01388500, 100 ft upstream from bridge on Jackson Avenue, left bank	6.6	184.5
Pompton Plains, NJ, upstream wingwall of bridge on Jackson Avenue, left bank	6.6	184.4
Pompton Plains, NJ, downstream wingwall of bridge on Jackson Avenue, right bank	6.6	184.3
Pequannock, NJ, upstream of bridge on NJ Route 23, left bank	5.2	182.0
Pequannock, NJ, downstream of bridge on NJ Route 23, left bank	5.2	182.0
Pequannock, NJ, upstream wingwall of CONRAIL railroad bridge, left bank	4.1	177.9
Pequannock, NJ, downstream wingwall of CONRAIL railroad bridge, right bank	4.1	177.8
Wayne, NJ, upstream wingwall of CONRAIL railroad bridge, right bank	2.6	176.7
Wayne, NJ, downstream wingwall of CONRAIL railroad bridge wingwall, left bank	2.6	176.2
Mountain View, NJ, upstream of bridge on Boonton Road, left bank	1.4	173.7
Mountain View, NJ, downstream of bridge on Boonton Road, left bank	1.4	173.1
Two Bridges, NJ, upstream of bridge on Two Bridges Road, left bank	0.0	171.9
Two Bridges, NJ, downstream of bridge on Two Bridges Road, right bank	0.0	171.8

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Preakness (Signac) Brook:		
Preakness, NJ, upstream of bridge on Ratzer Road, left bank	3.7	235.4
Preakness, NJ, USGS crest-stage gage 01389030, on downstream side of bridge on Ratzer Road, right bank	3.7	235.2
Deepavaal Brook:		
Pine Brook, NJ, 20 ft upstream of bridge on Clinton Avenue, right bank	3.7	171.3
Fairfield, NJ, 10 ft upstream of the end of Fairfield Place, right bank	2.4	171.1
Fairfield, NJ, 60 ft upstream of New Dutch Lane, right bank	1.0	170.3
Fairfield, NJ, 50 ft downstream of bridge on Little Falls Road, left bank	0.0	170.0
Peckman River:		
Verona, NJ, 20 ft upstream of bridge on Ozone Avenue, left bank	3.9	303.7
Verona, NJ, USGS crest-stage gage 01389534, on downstream side of bridge on Ozone Avenue, right bank	3.9	303.6
Molly Ann Brook:		
North Haledon, NJ, USGS crest-stage gage 01389765 on upstream side of bridge on Overlook Avenue, right bank	3.3	218.0
North Haledon, NJ, on downstream side of bridge on Overlook Avenue, left bank	3.3	216.4
Fleischer Brook:		
Elmwood Park, NJ, USGS crest-stage gage 01399900, at upstream side of culvert on Market Street, right bank	2.0	37.3
Dundee Canal:		
Clifton, NJ, downstream of Dundee Dam Canal gates, right bank	18.1	25.6
Garfield, NJ, at upstream side of bridge on Ackerman Avenue, right bank	17.7	25.5
Garfield, NJ, at downstream side of bridge on Ackerman Avenue, right bank	17.7	25.5

Table 5.-- Flood-crest data, April 5-7, 1984 -- continued

Stream and location	Miles above mouth	Elevation (Feet above sea level)
PASSAIC RIVER BASIN -- continued		
Second River:		
Belleville, NJ, USGS crest-stage gage 01392500, on Mill Street in Branch Brook Park, 300 ft downstream from Franklin Avenue, right bank	1.4	67.3
Saddle River:		
Upper Saddle River, NJ, 5 feet upstream of bridge on Lake Street, left bank	16.4	191.6
Upper Saddle River, NJ, USGS crest-stage gage 01390450, on downstream side of bridge on Lake Street, right bank	16.4	190.6
Ridgewood, NJ, USGS continuous-record gage 01390500, 15 ft upstream from bridge on NJ Route 17, left bank	10.6	78.5
Lodi, NJ, USGS continuous-record gage 01391500, 560 ft upstream of bridge on Outwater Lane, left bank	3.2	34.5
Hohokus Brook:		
Allendale, NJ, USGS crest-stage gage 01390810, upstream of bridge on Brookside Avenue, right bank	6.8	284.3
Allendale, NJ, downstream side of bridge on Brookside Avenue, left bank	6.8	283.5
Ho-Ho-Kus, NJ, USGS continuous-record gage 01391000, 500 ft upstream from bridge on Maple Avenue, left bank	3.5	125.4
Ramsey Brook:		
Allendale, NJ, 50 ft upstream of bridge on Brookside Avenue, left bank	0.6	274.6
Allendale, NJ, USGS crest-stage gage 01390900, at downstream side of bridge on Brookside Avenue, left bank	0.6	274.2
Third River:		
Passaic, NJ, USGS continuous-record gage 01392210, 400 ft upstream from bridge on NJ Route 3, right bank	1.2	27.0

REFERENCES CITED

Carswell, L.D., 1976, Appraisal of water resources in the Hackensack River basin, New Jersey: U.S. Geological Survey Water-Resources Investigations Report 76-74, 68 p.

McCall, J.E., 1967, Use of digital recorders with pond gages for measuring storm runoff: in Geological Survey Research 1967: U.S. Geological Survey Professional Paper 575A, p. B254-B257.

National Oceanic and Atmospheric Administration, Environmental Data Service, 1984a, Climatological data, New Jersey, March 1984, National Climatic Center, Asheville, N.C., v. 89, no. 3.

-----, 1984b, Climatological data, New Jersey, April 1984, National Climatic Center, Asheville, N.C., v. 89, no. 4.

-----, 1984c, Hourly precipitation data, New Jersey, March 1984, National Climatic Center, Asheville, N.C., v. 34, no. 3.

-----, 1984d, Hourly precipitation data, New Jersey, April 1984, National Climatic Center, Asheville, N.C., v. 34, no. 4.

-----, 1984e, Storm data, March 1984, National Climatic Center, Asheville, N.C., v. 26, no. 3.

-----, 1984f, Storm data, April 1984, National Climatic Center, Asheville, N.C., v. 26, no. 4

Stankowski, S.J., 1974, Magnitude and frequency of floods in New Jersey with effects of urbanization: New Jersey Department of Environmental Protection, Division of Water Resources, Special Report 38, 46p.

U.S. Army Corps Of Engineers, 1972, Passaic River basin, New Jersey and New York, Survey report for water resources: Volume II, Appendix A Hydrology, 26 p.

-----, 1978, Raymond Dam inspection report: national safety program, NJ00213, Philadelphia District, 15 p., 9 appendices.

U.S. Geological Survey, 1984, Water resources data for New Jersey NJ-84-1, Water year 1984: Volume 1, Atlantic Slope Basins, Hudson River to Cape May, 320 p.

U.S. Geological Survey, 1984, Water resources data for New York NY-84-1, Water year 1984: Volume 1, Eastern New York, excluding Long Island, 267 p.

U.S. Water Resources Council, 1981, Guidelines for determining flood flow frequency: Hydrology Committee Bulletin 17B, Washington D.C., 28 p., 14 appendices.

U.S. Weather Bureau, 1958, Rainfall-frequency regime: Weather Bureau Technical Paper 29, Part 3-The Middle Atlantic Region, 38 p.

SELECTED FLOOD REPORTS BY THE U.S. GEOLOGICAL SURVEY

Hollister, G.B., and Leighton, M.O., 1903, The Passaic flood of 1902: U.S. Geological Survey Water-Supply Paper and Irrigation Paper No. 88, 56 p.

Leighton, M.O., 1904, The Passaic flood of 1903: U.S. Geological Survey Water-Supply and Irrigation Paper No. 92, 48 p.

Murphy, E.C., 1906, Destructive floods in the United States in 1905: U.S. Geological Survey Water-Supply and Irrigation Paper No. 162, 105 p.

Grover, N.C., 1937, The floods of March 1936: Part 2, Hudson River to Susquehanna River region: U.S. Geological Survey Water-Supply Paper 799, 380 p.

U.S. Geological Survey, 1947, Minor floods of 1938 in the North Atlantic States: U.S. Geological Survey Water-Supply Paper 966, 426 p.

Paulson, C.G., 1960, Hurricane floods of September 1938: U.S. Geological Survey Water-Supply Paper 867, 562 p.

Bogart, D.B., 1960, Floods of August-October 1955 New England to North Carolina: U.S. Geological Survey Water-Supply Paper 1420, 854 p.

Rostvedt, J.O., 1965, Summary of floods in the United States during 1960: U.S. Geological Survey Water-Supply Paper 1790-B, 147 p.

Rostvedt, J.O., and others, 1972, Summary of floods in the United States during 1968: U.S. Geological Survey Water-Supply Paper 1970-B, 73 p.

Stankowski, S.J., 1972, Floods of August and September 1971 in New Jersey: New Jersey Department of Environmental Protection, Division of Water Resources Special Report 37, 350 p.

Stankowski, S.J., and Velnich, A.J., 1974, A summary of peak stages and discharges for the flood of August 1973 in New Jersey: U.S. Geological Survey Open-File Report, 12 p.

Stankowski, S.J., Schopp, R.D., and Velnich, A.J., 1975, Flood of July 21, 1975 in Mercer County, New Jersey: U.S. Geological Survey Water Resources Investigations 51-75, 52 p.

Schopp, R.D., and Velnich, A.J., 1979, Flood of November 8-10, 1977 in northeastern and central New Jersey: U.S. Geological Survey Open-File Report 79-559, 33 p.

Vickers, A.A., 1980, Flood of August 31-September 1, 1978, in Crosswicks Creek basin and vicinity, central New Jersey: U.S. Geological Survey Water-Resources Investigations 80-115, 26 p.

EXPLANATION OF STATION DATA

Discharge hydrographs are provided for most of the continuous-record streamflow-gaging stations in the Hackensack and Passaic River basins (see station data). These hydrographs provide an effective means for both cursory and intensive study of flood characteristics. These hydrographs represent the complex effects of variation in rainfall, antecedent conditions, ground cover, topography, basin storage, and geology. All of these factors are integrated in time and space to produce the flood event.

The effect of the coastal storm of March 29 and 30, on the streams in the Hackensack and Passaic River Basins is clearly indicated in almost all of the hydrographs. The streamflow at most gaging stations was increasing as a direct result of the snowmelt that occurred gradually after the storm. The resulting snowmelt played a significant role in the severe flooding that followed.

Included along with the discharge hydrographs are selected gage readings that can be used to recreate the discharge hydrographs or as data for modeling applications (see station data). More information (location, drainage area, period of record, and so on) regarding the gaging stations listed in the station data can be found in the U.S. Geological Survey annual reports for New Jersey, and New York (1984).

STATION DATA

(01) 01376800 HACKENSACK RIVER AT WEST NYACK, NY

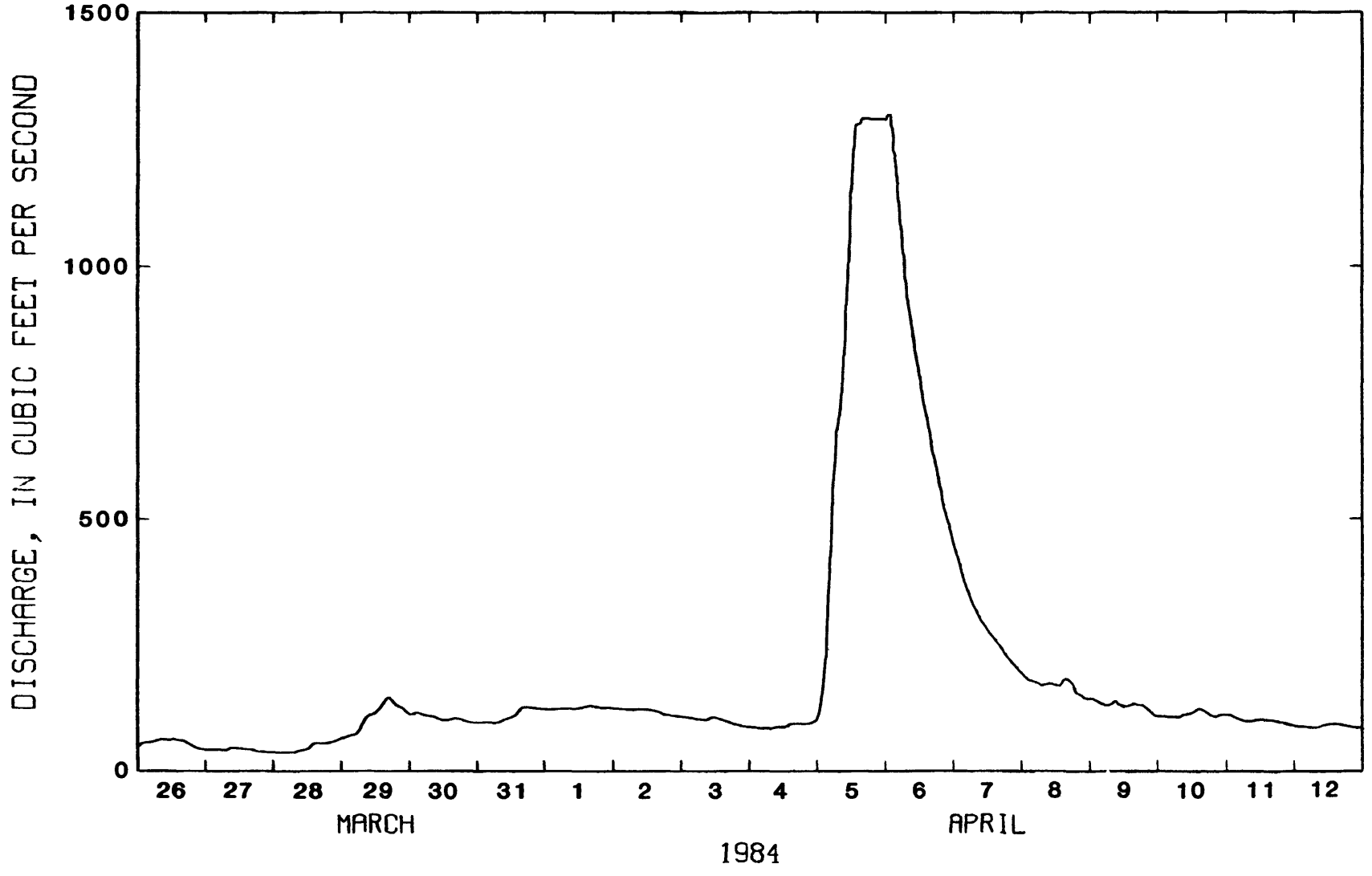
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0730	62	3.23
3-26	0800	63	3.25
3-26	1730	55	3.14
3-26	1800	54	3.13
3-26	1945	48	3.08
3-26	2215	43	3.03
3-26	2315	42	3.02
3-27	1000	46	3.06
3-27	1800	38	2.98
3-27	2315	36	2.96
3-28	0100	36	2.96
3-28	0745	37	2.97
3-28	1300	46	3.06
3-28	1600	56	3.15
3-28	1800	55	3.14
3-28	2400	65	3.27
3-29	0015	66	3.28
3-29	0030	67	3.29
3-29	0600	79	3.43
3-29	0745	95	3.61
3-29	1200	115	3.81
3-29	1530	139	4.04
3-29	1630	145	4.10
3-29	1800	141	4.06
3-29	2100	126	3.92
3-30	0015	112	3.79
3-30	0230	116	3.82
3-30	0600	109	3.75
3-30	1800	103	3.69
3-30	2115	97	3.63
3-31	0615	94	3.60
3-31	1545	125	3.91
3-31	1700	128	3.94
3-31	1800	128	3.94
4-01	0100	122	3.88
4-01	1515	129	3.95
4-01	1800	127	3.93
4-02	0015	124	3.90
4-02	1715	114	3.80
4-02	1800	111	3.78
4-02	2300	107	3.73
4-03	0015	107	3.73
4-03	1615	99	3.65
4-03	1800	95	3.61
4-03	2330	88	3.53
4-04	0345	85	3.50
4-04	0600	85	3.50
4-04	0700	84	3.49
4-04	1800	94	3.60
4-04	2400	104	3.70
4-05	0015	106	3.72
4-05	0100	119	3.85
4-05	0145	144	4.09
4-05	0215	174	4.35
4-05	0245	214	4.68
4-05	0315	262	5.04
4-05	0345	315	5.41
4-05	0430	409	6.02
4-05	0515	507	6.60
4-05	0600	596	7.09
4-05	0815	720	7.73
4-05	1000	885	8.52
4-05	1145	1090	9.35
4-05	1400	a1270	---
4-05	1600	a1360	---
4-05	a1800	1420	b10.46
4-05	2000	a1380	---
4-05	2200	a1360	---
4-05	2400	a1320	---
4-06	0415	1160	9.55
4-06	0600	1030	9.15
4-06	0815	918	8.67
4-06	1045	825	8.24
4-06	1315	740	7.83
4-06	1545	665	7.45
4-06	1800	602	7.12
4-06	2015	539	6.78
4-06	2245	481	6.45
4-06	2400	454	6.29
4-07	0015	449	6.26
4-07	0115	429	6.14
4-07	0330	385	5.87
4-07	0600	346	5.62
4-07	0900	310	5.38

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-07	1230	276	5.14	4-09	0230	139	4.04
4-07	1645	247	4.93	4-09	0600	130	3.96
4-07	1800	236	4.85	4-09	1800	131	3.97
4-07	2145	212	4.66	4-09	2145	117	3.83
4-07	2400	197	4.54	4-09	2400	109	3.75
4-08	0015	194	4.52	4-10	0645	106	3.72
4-08	0100	189	4.48	4-10	1430	125	3.91
4-08	0600	175	4.36				
4-08	1800	173	4.34	4-11	0015	112	3.79
4-08	1945	155	4.19	4-11	0315	105	3.71
4-08	2315	143	4.08	4-11	0600	100	3.66
				4-11	1800	98	3.64
4-09	0015	144	4.09	4-11	2400	89	3.55

a Estimated
b From high-water mark



(Map No. 1) 01376800 Hackensack River at West Nyack, NY--continued

(02) 01377000 HACKENSACK RIVER AT RIVERVALE, NJ

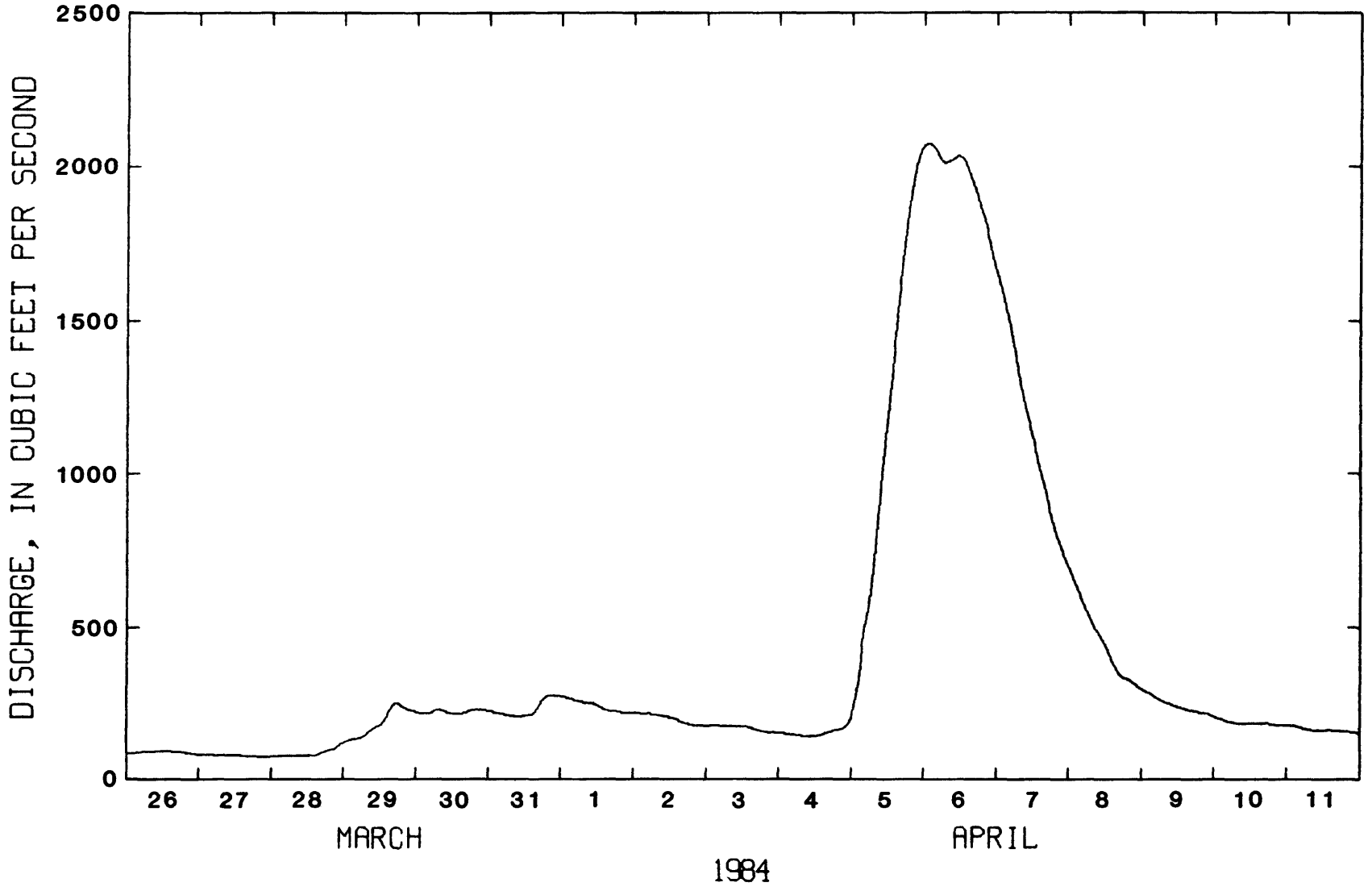
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	88	1.99
3-26	0515	94	2.02
3-26	0600	94	2.02
3-26	1800	90	2.00
3-26	2315	84	1.97
3-27	0015	84	1.97
3-27	1415	80	1.95
3-27	1800	78	1.94
3-27	1930	76	1.93
3-28	0015	78	1.94
3-28	1500	84	1.97
3-28	1545	86	1.98
3-28	1800	94	2.02
3-28	2115	104	2.07
3-28	2300	115	2.12
3-28	2345	120	2.14
3-29	0015	122	2.15
3-29	0100	127	2.17
3-29	0600	137	2.21
3-29	0800	152	2.27
3-29	1000	170	2.33
3-29	1300	188	2.39
3-29	1415	208	2.45
3-29	1515	228	2.51
3-29	1700	250	2.57
3-29	1800	250	2.57
3-29	2245	225	2.50
3-30	0115	218	2.48
3-30	0645	232	2.52
3-31	0900	208	2.45
3-31	1500	218	2.48
3-31	1730	250	2.57
3-31	1800	262	2.60
3-31	2000	277	2.64
4-01	0015	273	2.63
4-01	1415	232	2.52
4-01	1800	225	2.50
4-01	2000	221	2.49
4-02	0015	221	2.49
4-02	1330	201	2.43
4-02	1800	185	2.38
4-02	2000	179	2.36
4-03	0015	179	2.36
4-03	1715	164	2.31
4-03	1800	164	2.31
4-03	2315	152	2.27
4-04	0600	147	2.25
4-04	0815	144	2.24
4-04	1800	158	2.29
4-04	2230	176	2.35
4-04	2345	198	2.42
4-04	2400	204	2.44
4-05	0015	214	2.47
4-05	0030	225	2.50
4-05	0115	258	2.59
4-05	0200	294	2.68
4-05	0230	333	2.77
4-05	0300	370	2.85
4-05	0330	426	2.96
4-05	0400	477	3.07
4-05	0515	530	3.19
4-05	0600	576	3.29
4-05	0645	639	3.42
4-05	0730	708	3.57
4-05	0830	803	3.80
4-05	0915	886	3.99
4-05	1015	993	4.25
4-05	1115	1100	4.49
4-05	1230	1220	4.80
4-05	1345	1350	5.11
4-05	1500	1480	5.42
4-05	1645	1660	5.87
4-05	1800	1770	6.16
4-05	2045	1960	6.65
4-05	2400	2070	6.93
4-06	0100	2080	6.95
4-06	1200	2030	6.84
4-06	2145	1760	6.14
4-06	2400	1670	5.89
4-07	0015	1660	5.87
4-07	0230	1580	5.65
4-07	0600	1410	5.25
4-07	0845	1270	4.92
4-07	1145	1130	4.58

(02) 01377000 HACKENSACK RIVER AT RIVERVALE, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-07	1430	1010	4.29	4-09	0015	298	2.69
4-07	1700	906	4.04	4-09	0445	269	2.62
4-07	1800	868	3.95	4-09	0600	262	2.60
4-07	2045	778	3.74	4-09	1445	232	2.52
4-07	2345	700	3.55	4-09	1800	225	2.50
4-07	2400	696	3.54	4-09	2345	208	2.45
4-08	0015	692	3.53	4-10	0015	208	2.45
4-08	0245	624	3.39	4-10	0115	201	2.43
4-08	0530	557	3.25	4-10	0600	188	2.39
4-08	0600	548	3.23	4-10	1800	185	2.38
4-08	0900	490	3.10	4-10	2015	179	2.36
4-08	1215	437	2.98				
4-08	1415	390	2.89	4-11	0015	179	2.36
4-08	1630	346	2.80	4-11	0800	164	2.31
4-08	1800	337	2.78	4-11	1800	158	2.29
4-08	2330	302	2.70	4-11	2345	152	2.27



(Map No. 2) 01377000 Hackensack River at Rivervale, NJ--continued

(05) 01377500 PASCACK BROOK AT WESTWOOD, NJ

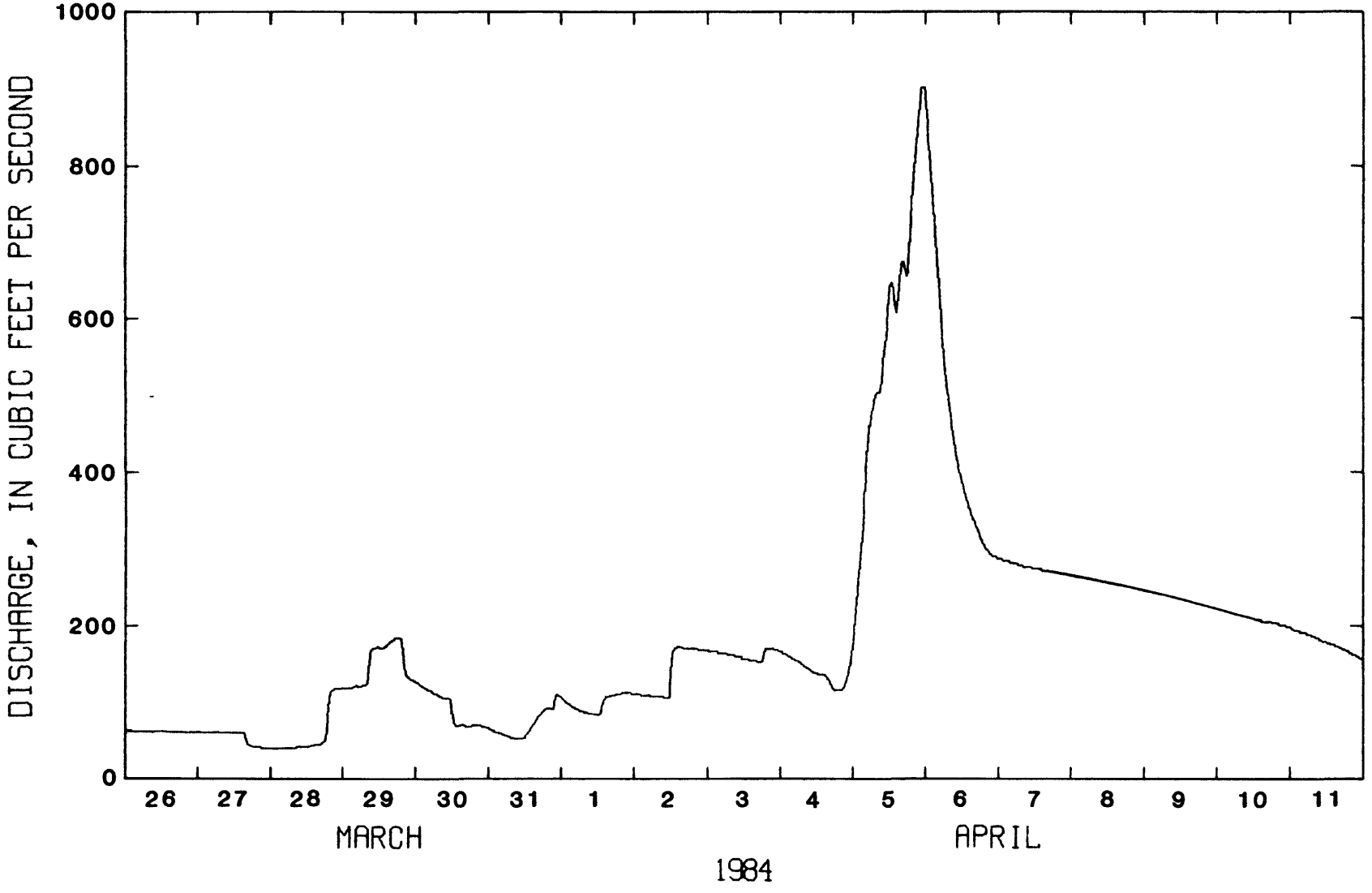
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	64	1.96
3-26	0600	63	1.95
3-26	1245	61	1.94
3-26	1800	61	1.94
3-27	0015	61	1.94
3-27	1500	60	1.93
3-27	1615	49	1.84
3-27	1800	43	1.79
3-27	2100	41	1.77
3-28	0015	41	1.77
3-28	1500	45	1.81
3-28	1800	50	1.85
3-28	1845	64	1.96
3-28	1900	81	2.07
3-28	1930	103	2.20
3-28	2115	119	2.28
3-29	0015	119	2.28
3-29	0800	125	2.31
3-29	0845	153	2.44
3-29	1000	171	2.52
3-29	1700	185	2.58
3-29	1800	185	2.58
3-29	2030	146	2.41
3-30	0015	125	2.31
3-30	0330	117	2.27
3-30	0600	111	2.24
3-30	1100	105	2.21
3-30	1215	83	2.08
3-30	1800	69	1.99
3-30	2315	67	1.98
3-31	0715	55	1.89
3-31	0830	53	1.88
3-31	1400	67	1.98
3-31	1615	81	2.07
3-31	1800	89	2.12
3-31	2215	109	2.23
3-31	2245	111	2.24
4-01	0900	86	2.10
4-01	1045	84	2.09
4-01	1415	103	2.20
4-01	1800	111	2.24
4-01	2000	113	2.25
4-02	0945	105	2.21
4-02	1215	140	2.38
4-02	1315	169	2.51
4-02	1415	174	2.53
4-02	1800	171	2.52
4-03	0600	160	2.47
4-03	1630	153	2.44
4-03	1800	153	2.44
4-03	1915	171	2.52
4-04	0600	144	2.40
4-04	1715	121	2.29
4-04	1800	117	2.27
4-04	2245	142	2.39
4-04	2400	174	2.53
4-05	0015	183	2.57
4-05	0045	209	2.68
4-05	0145	258	2.87
4-05	0300	315	3.07
4-05	0400	380	3.28
4-05	0545	465	3.53
4-05	0600	472	3.55
4-05	1100	578	3.84
4-05	1800	655	4.04
4-05	2015	798	4.39
4-05	2230	903	4.57
4-06	0015	869	4.53
4-06	0430	632	3.98
4-06	0600	555	3.78
4-06	0930	441	3.46
4-06	1430	352	3.19
4-06	1800	318	3.08
4-06	2330	289	2.98
4-07	0015	289	2.98
4-07	1415	272	2.92
4-07	1600	272	2.92
4-08	0600	266	2.90
4-08	1800	258	2.87
4-09	0600	245	2.82
4-09	1800	234	2.78
4-10	0600	221	2.73

(05) 01377500 PASCACK BROOK AT WESTWOOD, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-10	1230	209	2.68	4-11	0015	199	2.64
4-10	1800	204	2.66	4-11	1800	169	2.51
4-10	2230	199	2.64	4-11	2400	155	2.45



(Map No. 5) 01377500 Pascack Brook at Westwood, NJ--continued

(07) 01378500 HACKENSACK RIVER AT NEW MILFORD, NJ

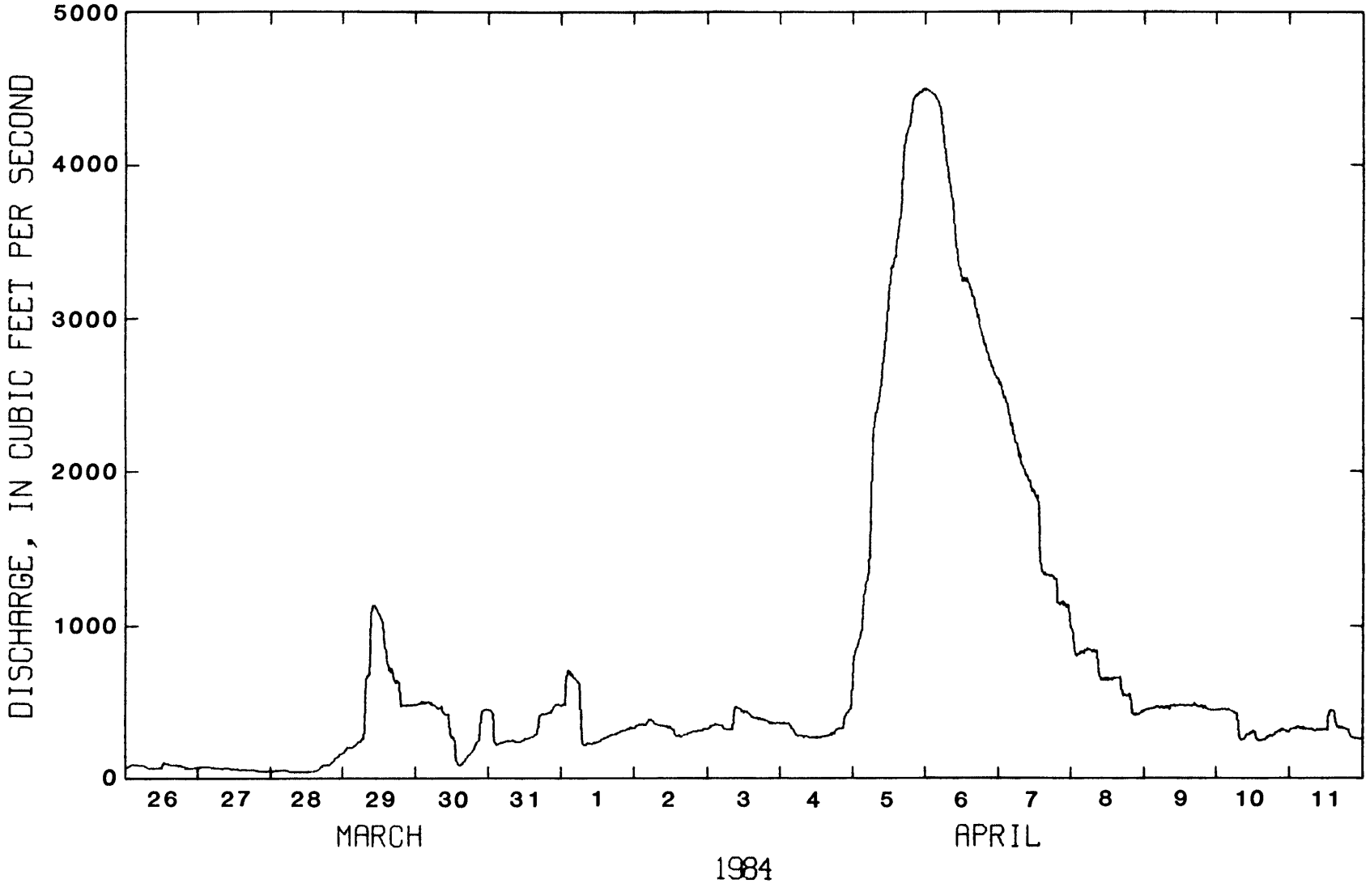
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	72	1.39
3-26	0145	88	1.44
3-26	0600	88	1.44
3-26	0745	68	1.38
3-26	0915	65	1.37
3-26	1230	105	1.49
3-26	1745	81	1.42
3-26	1800	85	1.43
3-26	2015	65	1.37
3-27	0330	78	1.41
3-27	0600	68	1.38
3-27	1400	53	1.33
3-27	1800	56	1.34
3-27	2200	42	1.29
3-28	0145	56	1.34
3-28	0600	45	1.30
3-28	0800	37	1.27
3-28	1530	56	1.34
3-28	1615	68	1.38
3-28	1730	85	1.43
3-28	1800	91	1.45
3-28	2030	113	1.51
3-28	2130	137	1.57
3-28	2400	167	1.64
3-29	0015	167	1.64
3-29	0130	205	1.72
3-29	0600	241	1.79
3-29	0715	334	1.96
3-29	0730	526	2.28
3-29	0745	640	2.45
3-29	0900	793	2.66
3-29	0930	1080	3.01
3-29	1000	1140	3.09
3-29	1415	848	2.73
3-29	1630	675	2.50
3-29	1800	640	2.45
3-29	1915	500	2.24
3-30	0200	506	2.25
3-30	1115	358	2.00
3-30	1145	283	1.87
3-30	1315	154	1.61
3-30	1330	121	1.53
3-30	1400	95	1.46
3-30	1430	88	1.44
3-30	1615	117	1.52
3-30	1700	141	1.58
3-30	1800	163	1.63
3-30	1930	210	1.73
3-30	2130	334	1.96
3-30	2200	427	2.12
3-31	0200	283	1.87
3-31	0245	220	1.75
3-31	0600	246	1.80
3-31	1615	300	1.90
3-31	1645	386	2.05
3-31	1800	427	2.12
3-31	2245	494	2.23
4-01	0130	592	2.38
4-01	0230	719	2.56
4-01	0600	619	2.42
4-01	0630	369	2.02
4-01	0645	278	1.86
4-01	0715	220	1.75
4-01	1415	267	1.84
4-01	1800	294	1.89
4-02	0145	364	2.01
4-02	0500	392	2.06
4-02	0600	380	2.04
4-02	1330	294	1.89
4-02	1400	278	1.86
4-02	1800	300	1.90
4-03	0245	364	2.01
4-03	0600	328	1.95
4-03	0630	322	1.94
4-03	0845	403	2.08
4-03	0930	475	2.20
4-03	1800	392	2.06
4-04	0500	305	1.91
4-04	0600	278	1.86
4-04	1130	267	1.84
4-04	1800	300	1.90
4-04	2115	386	2.05
4-04	2330	469	2.19
4-04	2400	654	2.47
4-05	0015	741	2.59
4-05	0030	793	2.66

(07) 01378500 HACKENSACK RIVER AT NEW MILFORD, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-05	0245	969	2.88
4-05	0345	1190	3.16
4-05	0545	1520	3.56
4-05	0600	1700	3.77
4-05	0645	2180	4.35
4-05	0945	2650	4.95
4-05	1215	3210	5.78
4-05	1645	3980	6.98
4-05	1800	4200	7.39
4-05	2315	4500	7.96
4-06	0015	4500	7.94
4-06	0500	4380	7.72
4-06	1115	3360	6.00
4-06	1800	2960	5.41
4-06	2345	2610	4.90
4-07	0015	2590	4.88
4-07	0345	2350	4.57
4-07	0600	2190	4.36
4-07	1330	1540	3.58
4-07	1800	1320	3.32
4-07	2330	1050	2.98
4-07	2345	1000	2.92
4-08	0015	977	2.89
4-08	0115	832	2.71
4-08	0600	848	2.73
4-08	0930	675	2.50
4-08	1800	552	2.32
4-08	2000	439	2.14
4-08	2115	421	2.11
4-09	0015	451	2.16
4-09	1645	500	2.24
4-10	0145	463	2.18
4-10	0700	433	2.13
4-10	0715	346	1.98
4-10	0745	267	1.84
4-10	1400	251	1.81
4-10	1800	283	1.87
4-11	0215	340	1.97
4-11	0600	334	1.96
4-11	1200	328	1.95
4-11	1245	403	2.08
4-11	1345	451	2.16
4-11	1800	334	1.96
4-11	2100	267	1.84
4-11	2130	262	1.83

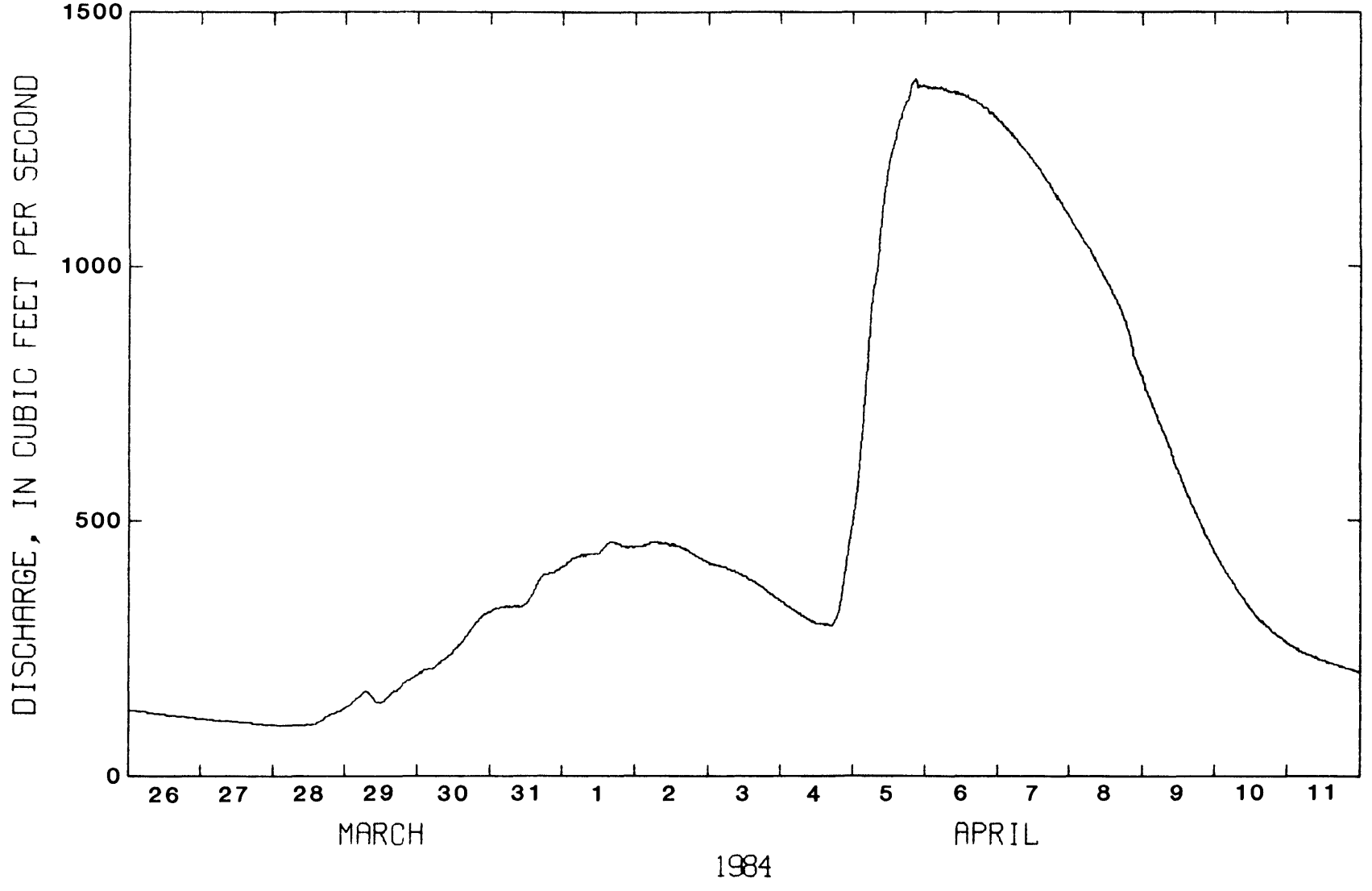


(Map No. 7) 01378500 Hackensack River at New Milford, NJ--continued

(11) 01379000 PASSAIC RIVER NEAR MILLINGTON, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	130	5.40
3-26	0600	128	5.39
3-26	1800	118	5.34
3-26	2215	114	5.32
3-27	0015	114	5.32
3-27	1800	103	5.26
3-27	2045	102	5.25
3-28	0130	100	5.24
3-28	1000	100	5.74
3-28	1800	118	5.34
3-28	2345	134	5.42
3-29	0015	135	5.43
3-29	0215	143	5.47
3-29	0600	162	5.57
3-29	1200	144	5.48
3-29	1800	172	5.62
3-29	2330	198	5.74
3-30	0015	198	5.74
3-30	0200	207	5.78
3-30	0600	215	5.81
3-30	1415	260	5.98
3-30	1800	289	6.08
3-30	2330	321	6.19
3-31	0015	321	6.19
3-31	1315	347	6.27
3-31	1800	394	6.41
3-31	2330	408	6.45
4-01	0015	412	6.46
4-01	1530	457	6.58
4-01	1800	453	6.57
4-02	0500	457	6.58
4-02	1800	438	6.53
4-02	2330	419	6.48
4-03	0015	419	6.48
4-03	1800	370	6.34
4-03	2330	343	6.26
4-04	1500	294	6.10
4-04	1800	300	6.12
4-04	2045	366	6.33
4-04	2245	445	6.55
4-04	2400	493	6.67
4-05	0015	505	6.70
4-05	0100	535	6.77
4-05	0245	648	7.02
4-05	0445	787	7.33
4-05	0600	902	7.53
4-05	0930	1080	8.06
4-05	1200	1200	8.41
4-05	1630	1300	8.68
4-05	1800	1330	8.75
4-05	2045	1370	8.87
4-06	0015	1350	8.83
4-06	1800	1320	8.73
4-06	2345	1290	8.65
4-07	0015	1290	8.64
4-07	1800	1150	8.26
4-07	2345	1100	8.10
4-08	0015	1090	8.09
4-08	1630	918	7.57
4-08	1800	894	7.51
4-08	2400	782	7.32
4-09	0015	777	7.31
4-09	0415	713	7.17
4-09	0600	687	7.11
4-09	1500	548	6.80
4-09	1800	510	6.71
4-09	2400	434	6.52
4-10	0015	434	6.52
4-10	0300	404	6.44
4-10	0600	376	6.36
4-10	1530	300	6.12
4-10	1800	289	6.08
4-10	2330	260	5.98
4-11	0015	257	5.97
4-11	0900	230	5.87
4-11	1800	212	5.80
4-11	2300	202	5.76

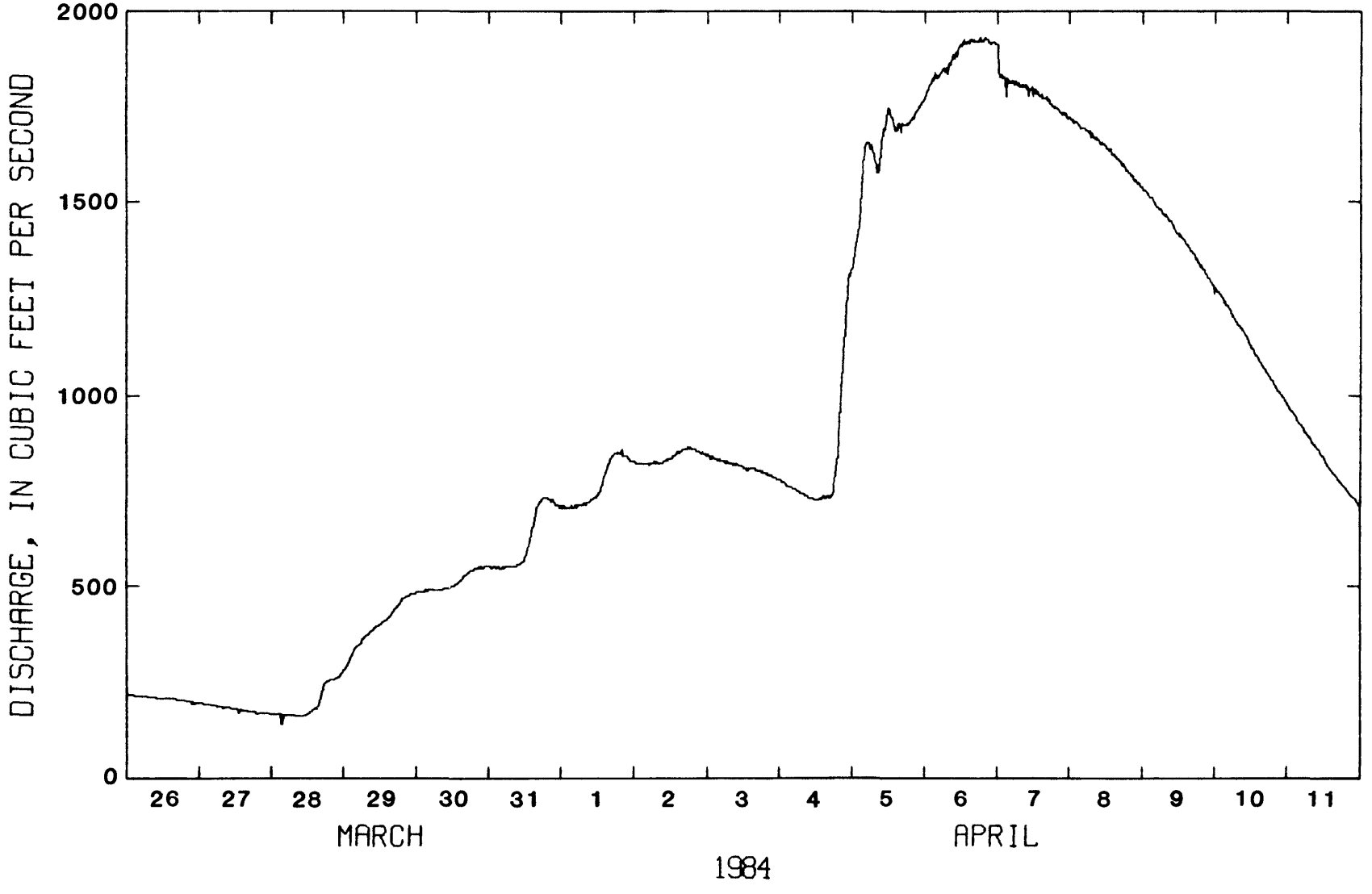


(Map No. 11) 01379000 Passaic River near Millington, NJ--continued

(12) 01379500 PASSAIC RIVER NEAR CHATHAM, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	217	4.25
3-26	0600	214	4.24
3-26	1800	204	4.21
3-26	2130	194	4.18
3-27	0015	197	4.19
3-27	1200	181	4.14
3-27	1800	174	4.12
3-28	1000	162	4.08
3-28	1615	210	4.23
3-28	1800	250	4.34
3-28	2400	281	4.42
3-29	0015	281	4.42
3-29	0130	301	4.47
3-29	0600	359	4.60
3-29	1600	432	4.75
3-29	1800	452	4.79
3-29	2400	484	4.85
3-30	0015	484	4.85
3-30	1800	541	4.95
3-30	2100	553	4.97
3-31	0100	547	4.96
3-31	0900	553	4.97
3-31	1445	653	5.13
3-31	1800	734	5.25
4-01	0030	707	5.21
4-01	0800	714	5.22
4-01	1800	848	5.44
4-01	2000	861	5.46
4-02	0515	817	5.39
4-02	1745	867	5.47
4-02	1800	867	5.47
4-03	0015	848	5.44
4-03	1800	805	5.37
4-03	2315	781	5.33
4-04	1130	728	5.24
4-04	1800	751	5.28
4-04	2000	938	5.58
4-04	2130	1140	5.93
4-04	2345	1330	6.25
4-05	0015	1330	6.26
4-05	0100	1370	6.33
4-05	0500	1660	6.80
4-05	0600	1640	6.78
4-05	1800	1700	6.87
4-05	2345	1770	6.99
4-06	0015	1780	7.01
4-06	1800	1920	7.24
4-06	1830	1930	7.26
4-07	0015	1910	7.23
4-07	0800	1800	7.04
4-07	1800	1760	6.97
4-07	2330	1720	6.90
4-08	0015	1720	6.91
4-08	0800	1670	6.82
4-08	1800	1600	6.70
4-08	2400	1530	6.60
4-09	0015	1530	6.60
4-09	0800	1460	6.48
4-09	1800	1360	6.30
4-09	2345	1260	6.14
4-10	0015	1270	6.16
4-10	1530	1080	5.83
4-10	1800	1050	5.78
4-10	2400	977	5.65
4-11	0015	977	5.65
4-11	1200	836	5.42
4-11	1800	769	5.31
4-11	2400	707	5.21



(Map No. 12) 01379500 Passaic River near Chatham, NJ--continued

(--) 01379530 CANOE BROOK NEAR SUMMIT, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	12.	11.97
3-26	0600	11.	11.96
3-26	1800	10.	11.93
3-26	2345	9.9	11.91
3-27	0015	9.9	11.91
3-27	1800	9.3	11.87
3-27	2215	9.2	11.86
3-28	0100	9.1	11.85
3-28	1245	12.	11.96
3-28	1345	14.	12.03
3-28	1430	18.	12.09
3-28	1515	22.	12.16
3-28	1600	27.	12.24
3-28	1700	33.	12.34
3-28	1730	40.	12.42
3-28	1800	48.	12.50
3-28	1845	53.	12.55
3-28	2215	38.	12.39
3-29	1115	32.	12.32
3-29	1515	47.	12.49
3-29	1715	57.	12.59
3-29	1800	63.	12.63
3-29	1945	75.	12.73
3-29	2300	82.	12.77
3-30	0015	80.	12.76
3-30	0815	59.	12.60
3-30	1130	51.	12.53
3-30	1800	61.	12.62
3-31	0315	49.	12.51
3-31	0600	44.	12.46
3-31	0915	39.	12.41
3-31	1330	55.	12.57
3-31	1415	72.	12.70
3-31	1445	89.	12.82
3-31	1515	110.	12.94
3-31	1545	134.	13.06
3-31	1630	169.	13.21
3-31	1745	203.	13.33
3-31	1800	206.	13.34
3-31	1830	209.	13.35
3-31	2115	161.	13.18
3-31	2245	128.	13.03
4-01	0045	100.	12.89
4-01	0300	79.	12.75
4-01	0600	62.	12.62
4-01	0945	49.	12.51
4-01	1015	48.	12.50
4-01	1330	61.	12.62
4-01	1415	79.	12.75
4-01	1445	96.	12.86
4-01	1515	115.	12.97
4-01	1600	147.	13.12
4-01	1700	185.	13.27
4-01	1800	206.	13.34
4-01	1815	209.	13.35
4-01	2130	159.	13.17
4-01	2300	126.	13.02
4-02	0015	107.	12.93
4-02	0100	98.	12.87
4-02	0315	78.	12.74
4-02	0600	62.	12.63
4-02	0945	50.	12.52
4-02	1030	36.	12.36
4-02	1045	26.	12.23
4-02	1115	24.	12.19
4-02	1400	33.	12.33
4-02	1445	42.	12.44
4-02	1515	51.	12.53
4-02	1600	67.	12.66
4-02	1645	83.	12.78
4-02	1800	100.	12.88
4-02	2130	80.	12.76
4-02	2315	62.	12.63
4-03	0015	55.	12.56
4-03	0100	50.	12.52
4-03	0300	39.	12.41
4-03	0530	13.	12.00
4-03	0545	9.4	11.87
4-03	0600	8.6	11.81
4-03	0700	6.8	11.71
4-03	0900	5.3	11.59
4-03	0945	4.0	11.49
4-03	1015	2.7	11.36
4-03	1030	1.8	11.27
4-03	1045	0.8	11.14
4-03	1100	0.1	10.97
4-03	1115	0.	10.79
4-03	1130	0.	10.74

(--) 01379530 CANOE BROOK NEAR SUMMIT, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

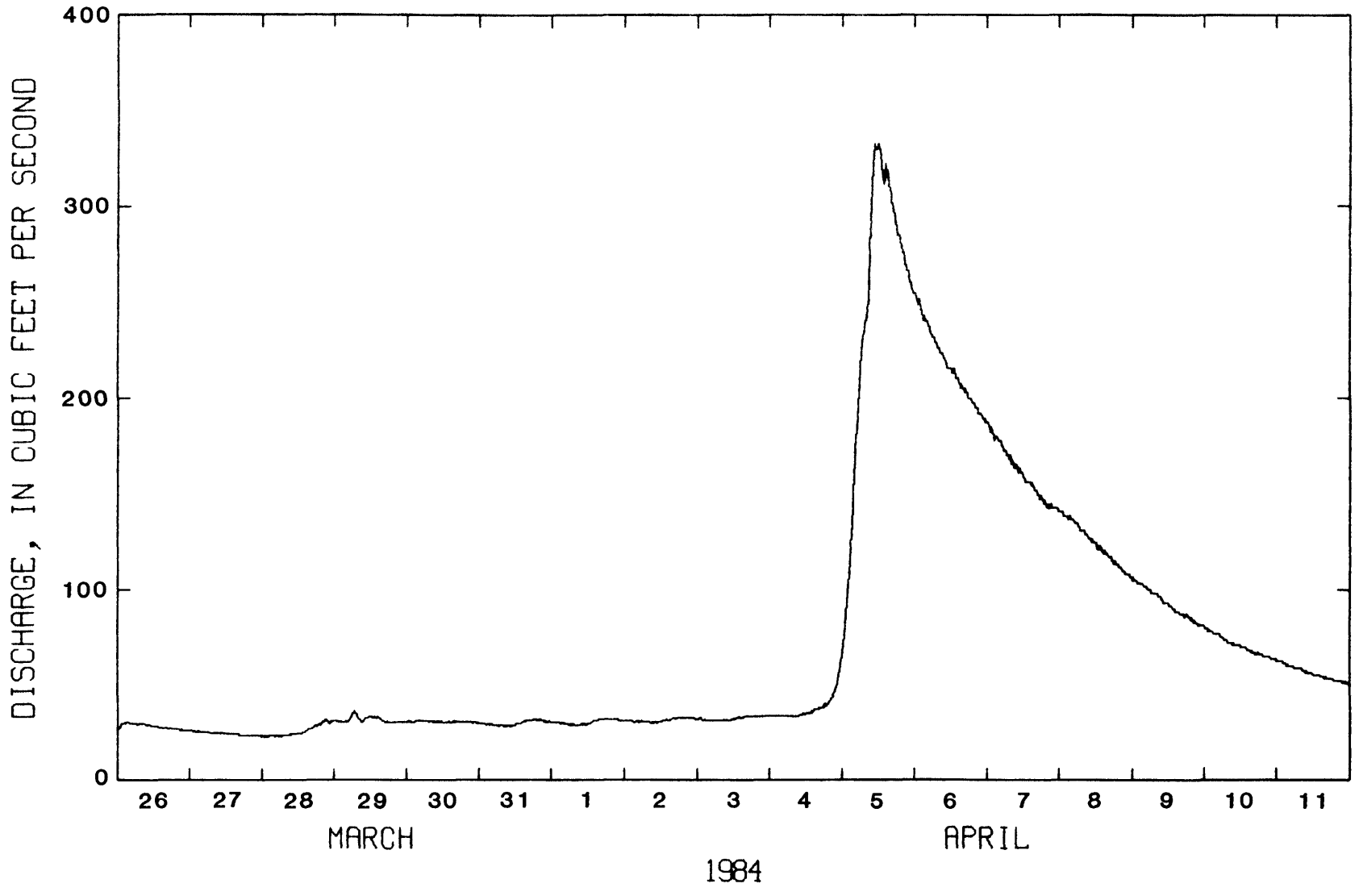
DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-03	1800	24.	12.19	4-05	2400	a	14.45
4-03	2015	18.	12.10				
4-03	2115	14.	12.02	4-06	0015	a	14.43
4-03	2130	28.	12.24	4-06	0300	a	14.31
4-03	2145	14.	12.01	4-06	0600	a	14.24
4-03	2215	10.	11.92	4-06	1500	a	14.15
4-03	2315	7.7	11.76	4-06	1800	a	14.15
4-04	0100	6.0	11.65	4-07	0015	a	14.17
4-04	0200	4.3	11.51	4-07	1800	a	14.30
4-04	0230	2.7	11.36	4-07	2245	a	14.32
4-04	0245	1.4	11.23				
4-04	0300	0.3	11.03	4-08	0015	a	14.31
4-04	0315	0.	10.83	4-08	1800	a	14.17
4-04	0430	0.	10.75	4-08	2345	a	14.07
4-04	0600	13.	11.99				
4-04	0615	2.7	11.35	4-09	0015	a	14.06
4-04	0630	0.	10.82	4-09	0445	a	13.97
4-04	0645	0.	10.87	4-09	0600	a	13.94
4-04	1800	70.	12.69	4-09	1400	a	13.74
4-04	1845	89.	12.82	4-09	1800	a	13.64
4-04	1915	111.	12.95	4-09	2400	a	13.49
4-04	1945	163.	13.18				
4-04	2000	199.	13.32	4-10	0015	a	13.48
4-04	2030	262.	13.51	4-10	0045	a	13.47
4-04	2045	315.	13.65	4-10	0600	a	13.32
4-04	2115	427.	13.91	4-10	1000	a	13.17
4-04	2145	533.	14.10	4-10	1400	a	13.03
4-04	2215	711.	14.36	4-10	1800	a	12.90
4-04	2245	898.	14.59	4-10	2000	a	12.77
4-04	2315	1090.	14.78	4-10	2330	a	12.65
4-04	2400	1400.	15.06	4-10	2400	a	12.64
4-05	0045	a	15.38	4-11	0215	a	12.68
4-05	0130	a	15.68	4-11	0830	a	12.54
4-05	0400	a	15.95	4-11	1230	a	12.43
4-05	0600	a	16.05	4-11	1615	a	12.33
4-05	0630	a	16.06	4-11	1800	a	12.28
4-05	1800	a	15.03	4-11	2200	a	12.17
4-05	2030	a	14.76	4-11	2400	a	12.12
4-05	2245	a	14.53				

a Stage-discharge relation indeterminate due to backwater from the Passaic River

(14) 01379773 GREEN POND BROOK AT PICATINNY ARSENAL, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	28	1.98
3-26	0230	31	2.02
3-26	0600	30	2.01
3-26	1800	27	1.97
3-26	2045	26	1.96
3-27	0015	26	1.96
3-27	1800	23	1.92
3-27	2345	23	1.91
3-28	0030	23	1.91
3-28	1100	24	1.93
3-28	1700	28	1.99
3-28	1800	29	2.00
3-28	2100	32	2.04
3-29	0400	31	2.02
3-29	0545	36	2.08
3-29	0645	36	2.09
3-29	0800	32	2.04
3-29	1800	31	2.02
3-30	0030	31	2.03
3-30	1800	31	2.02
3-30	2200	30	2.01
3-31	0630	28	1.99
3-31	1800	32	2.04
4-01	0545	29	2.00
4-01	1530	32	2.04
4-01	1800	32	2.04
4-02	0830	30	2.01
4-02	1600	33	2.05
4-02	1800	33	2.05
4-03	0200	31	2.03
4-03	1400	34	2.06
4-03	1800	34	2.06
4-04	0015	34	2.06
4-04	0900	34	2.06
4-04	1800	38	2.11
4-04	2130	46	2.19
4-04	2300	56	2.28
4-04	2400	65	2.36
4-05	0015	69	2.39
4-05	0115	87	2.52
4-05	0215	109	2.65
4-05	0315	135	2.79
4-05	0415	168	2.94
4-05	0545	203	3.08
4-05	0600	208	3.10
4-05	0845	252	3.26
4-05	1000	309	3.44
4-05	1045	333	3.51
4-05	1800	292	3.39
4-06	0015	255	3.27
4-06	0600	232	3.19
4-06	1800	200	3.07
4-06	2315	188	3.02
4-07	0015	188	3.02
4-07	1215	159	2.90
4-07	1800	150	2.86
4-07	2345	141	2.82
4-08	0015	141	2.82
4-08	1430	119	2.71
4-08	1800	116	2.69
4-08	2315	107	2.64
4-09	0030	107	2.64
4-09	1215	92	2.55
4-09	1800	87	2.52
4-09	2145	81	2.48
4-10	0015	80	2.47
4-10	1415	69	2.39
4-10	1800	67	2.38
4-10	2400	63	2.34
4-11	0015	63	2.34
4-11	1545	53	2.26
4-11	1800	53	2.26
4-11	2400	50	2.23

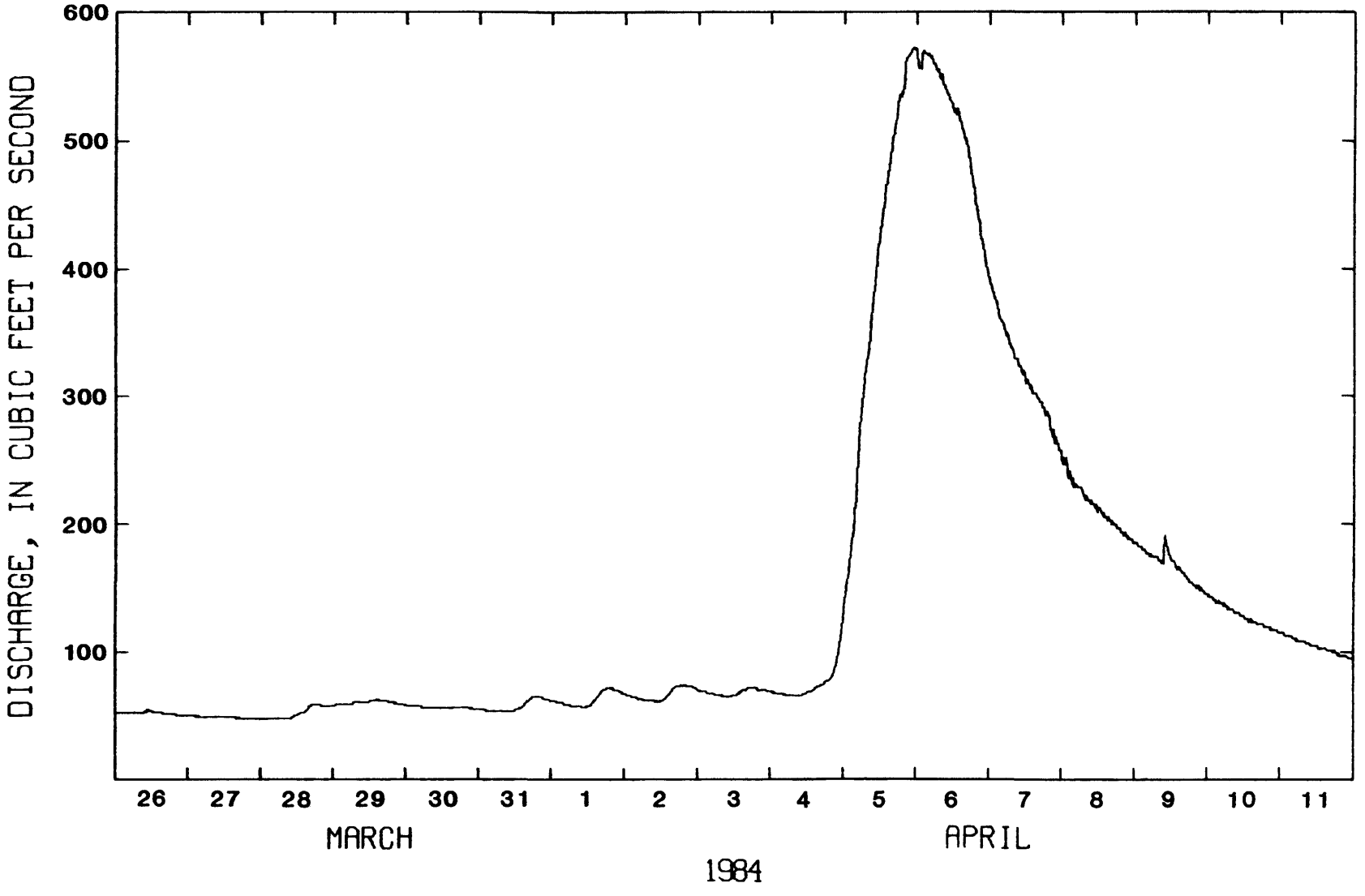


(Map No. 14) 01379773 Green Pond Brook at Picatinny Arsenal, NJ--continued

(15) 01379790 GREEN POND BROOK AT WHARTON, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	52	3.07
3-26	0600	52	3.07
3-26	1045	55	3.09
3-26	1800	51	3.06
3-26	2030	50	3.05
3-27	0015	50	3.05
3-27	1600	47	3.03
3-27	1800	47	3.03
3-28	0015	47	3.03
3-28	1000	47	3.03
3-28	1600	57	3.11
3-28	1645	59	3.12
3-28	1800	59	3.12
3-29	0015	57	3.11
3-29	1430	63	3.15
3-29	1800	61	3.14
3-30	0015	57	3.11
3-30	1800	56	3.10
3-30	2130	55	3.09
3-31	0245	54	3.08
3-31	1100	54	3.08
3-31	1745	64	3.16
3-31	1800	64	3.16
4-01	1000	56	3.10
4-01	1800	70	3.20
4-01	1815	71	3.21
4-02	1015	60	3.13
4-02	1800	73	3.22
4-02	1845	74	3.23
4-03	0815	64	3.16
4-03	1645	71	3.21
4-03	1800	71	3.21
4-04	0445	66	3.17
4-04	1800	76	3.24
4-04	2200	92	3.35
4-04	2315	111	3.46
4-04	2400	125	3.53
4-05	0015	133	3.54
4-05	0030	141	3.57
4-05	0200	170	3.69
4-05	0345	212	3.84
4-05	0515	263	3.96
4-05	0600	288	4.01
4-05	0845	347	4.19
4-05	1130	419	4.45
4-05	1645	507	4.81
4-05	1800	530	4.90
4-05	2245	572	5.11
4-06	0200	570	5.10
4-06	1800	480	4.70
4-06	2400	393	4.35
4-07	0015	393	4.35
4-07	0115	383	4.31
4-07	0600	347	4.19
4-07	1800	292	4.02
4-07	2400	252	3.94
4-08	0030	252	3.94
4-08	0315	232	3.90
4-08	0600	229	3.89
4-08	1800	197	3.79
4-08	2330	186	3.75
4-09	0900	172	3.70
4-09	1000	191	3.77
4-09	1200	175	3.71
4-09	1715	157	3.64
4-09	1800	155	3.63
4-09	2315	145	3.59
4-10	0030	145	3.59
4-10	1630	122	3.49
4-10	1800	122	3.49
4-10	2315	115	3.46
4-11	0015	115	3.46
4-11	1800	101	3.39
4-11	2215	95	3.36



(Map No. 15) 01379790 Green Pond Brook at Wharton, NJ--continued

(17) 01380000 BEAVER BROOK AT OUTLET OF SPLITROCK POND, NJ

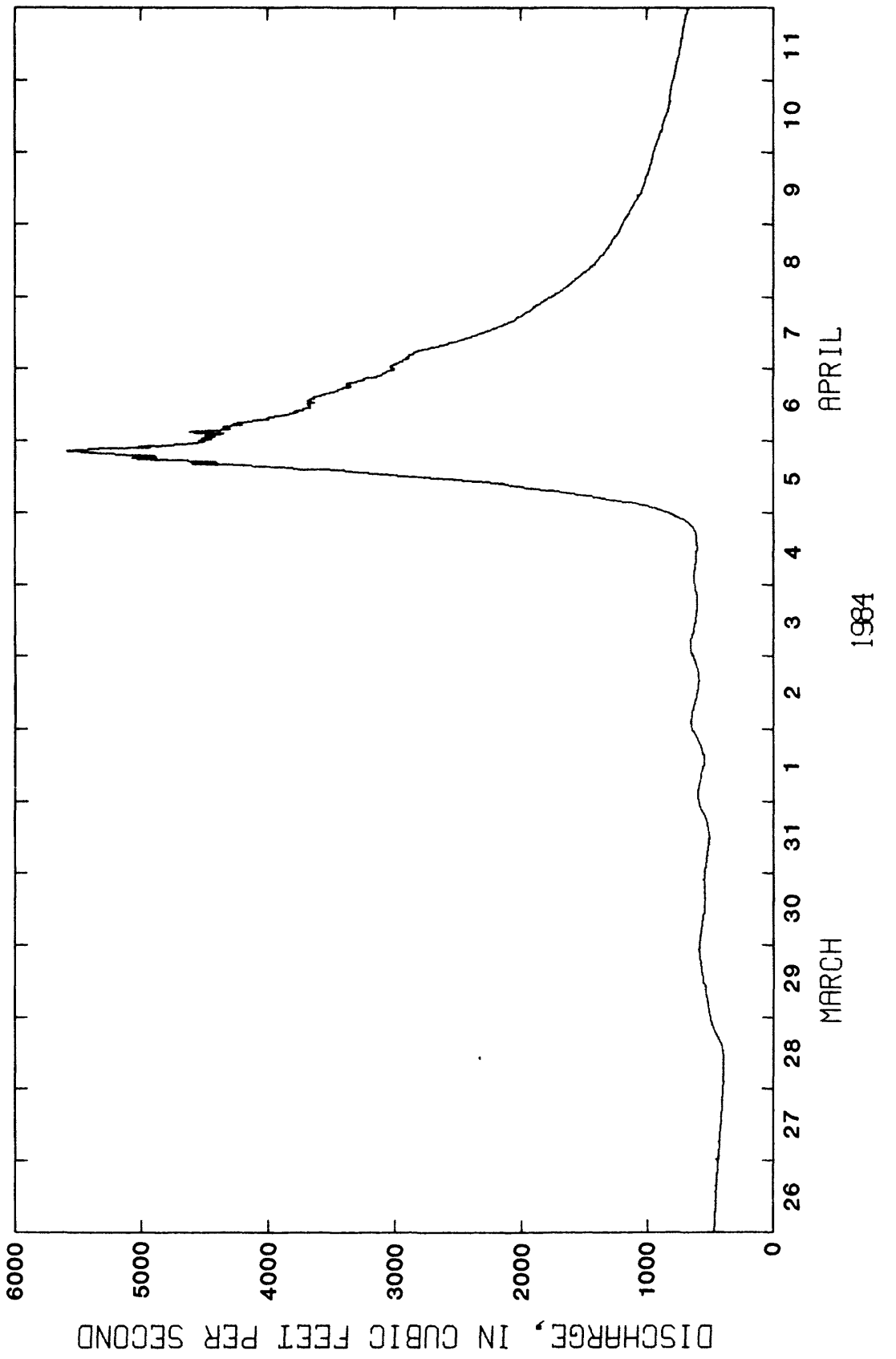
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0900	24	1.20	4-04	0900	26	1.24
3-27	0900	18	1.08	4-05	0900	134	2.54
3-28	0900	16	1.04	4-06	0900	196	3.02
3-29	0900	23	1.18	4-07	0900	111	2.33
3-30	0900	32	1.34	4-08	0900	78	1.98
3-31	0900	26	1.24	4-09	0900	57	1.73
4-01	0900	30	1.30	4-10	0900	40	1.50
4-02	0900	24	1.20	4-11	0900	32	1.34
4-03	0900	28	1.26				

(18) 01380500 ROCKAWAY RIVER ABOVE RESERVOIR, AT BOONTON, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	474	3.09
3-26	0600	469	3.08
3-26	1800	452	3.05
3-26	2000	447	3.04
3-27	0015	463	3.07
3-27	1800	412	2.98
3-27	2130	405	2.97
3-28	0115	399	2.96
3-28	1100	399	2.96
3-28	1800	452	3.05
3-28	2245	503	3.14
3-29	0015	509	3.15
3-29	0900	545	3.21
3-29	1800	576	3.26
3-29	2145	589	3.28
3-30	0015	583	3.27
3-30	1030	551	3.22
3-30	1800	551	3.22
3-31	1130	515	3.16
3-31	1800	539	3.20
3-31	2330	595	3.29
4-01	0600	589	3.28
4-01	1200	551	3.22
4-01	1800	570	3.25
4-01	2345	642	3.36
4-02	0200	655	3.38
4-02	1615	589	3.28
4-02	1800	595	3.29
4-03	0130	648	3.37
4-03	1515	608	3.31
4-03	1800	608	3.31
4-04	0100	628	3.34
4-04	1130	608	3.31
4-04	1800	628	3.34
4-04	2245	768	3.55
4-04	2400	831	3.66
4-05	0015	843	3.68
4-05	0130	927	3.82
4-05	0330	1140	4.16
4-05	0515	1380	4.53
4-05	0600	1510	4.69
4-05	0745	1830	5.06
4-05	1000	2210	5.46
4-05	1130	2670	5.86
4-05	1315	3240	6.24
4-05	1515	3900	6.59
4-05	1730	4720	6.93
4-05	1800	4990	7.03
4-05	2030	5590	7.23
4-05	2400	4540	6.86
4-06	0245	4620	6.89
4-06	0800	3970	6.62
4-06	1800	3360	6.31
4-06	2345	3010	6.10
4-07	0030	3040	6.12
4-07	0730	2690	5.87
4-07	1430	2140	5.39
4-07	1800	1990	5.23
4-07	2400	1760	4.98
4-08	0015	1750	4.97
4-08	0500	1590	4.78
4-08	0600	1550	4.74
4-08	1800	1280	4.38
4-08	2345	1200	4.25
4-09	0015	1190	4.24
4-09	1330	1020	3.97
4-09	1800	989	3.92
4-09	2330	945	3.85
4-10	0015	945	3.85
4-10	1800	819	3.64
4-10	2315	796	3.60
4-11	0015	791	3.59
4-11	1800	704	3.45
4-11	2315	676	3.41

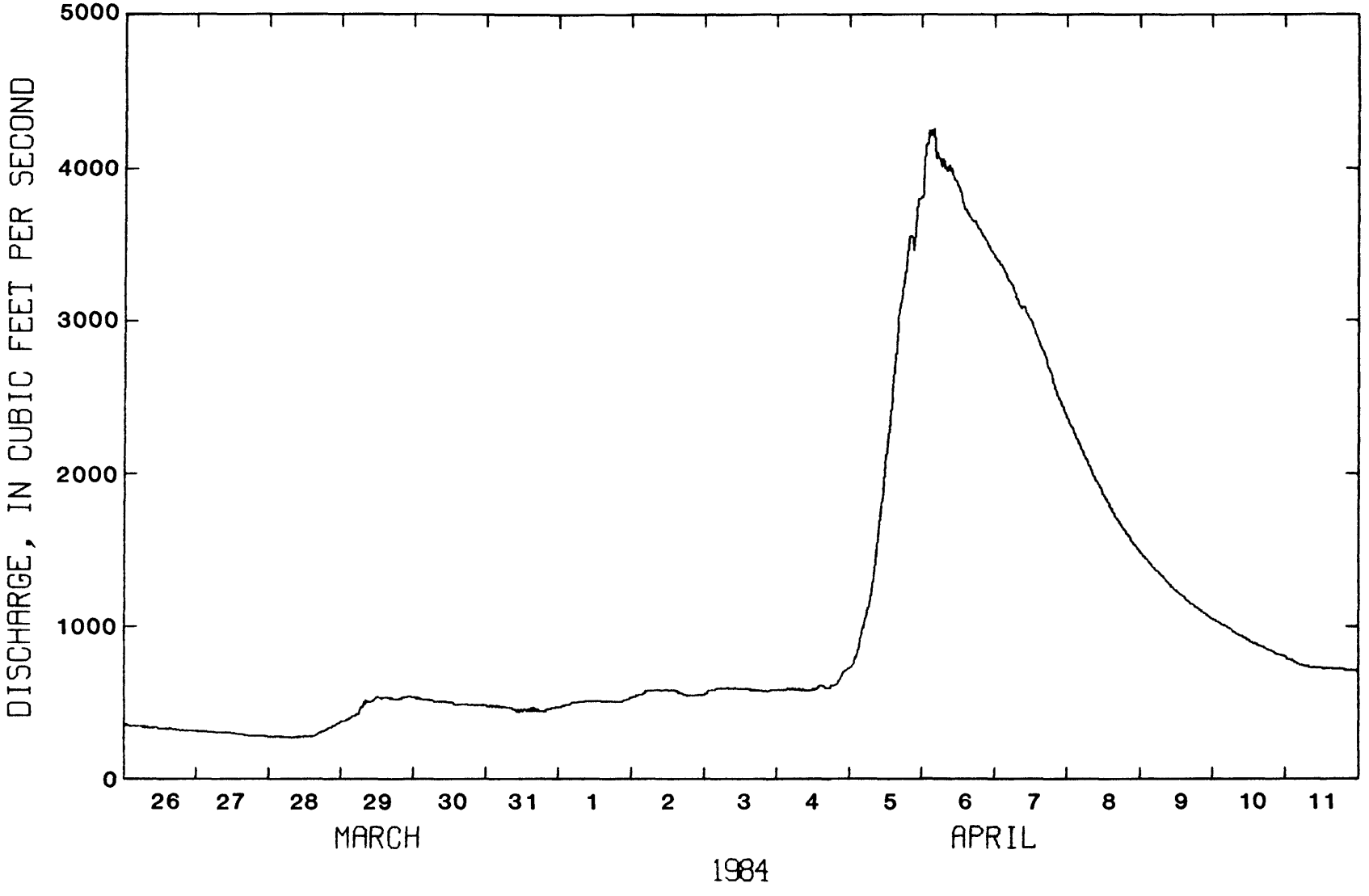


(Map No. 18) 01380500 Rockaway River above reservoir at Boonton, NJ--continued

(19) 01381000 ROCKAWAY RIVER BELOW RESERVOIR, AT BOONTON, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	353	3.28
3-26	0045	362	3.29
3-26	0600	348	3.27
3-26	1800	321	3.22
3-26	2330	313	3.20
3-27	0015	317	3.21
3-27	1800	284	3.13
3-27	2300	276	3.11
3-28	0700	268	3.09
3-28	1800	308	3.19
3-28	2400	377	3.31
3-29	0015	377	3.31
3-29	0600	428	3.38
3-29	0815	516	3.48
3-29	1200	537	3.51
3-29	1800	521	3.49
3-30	0015	532	3.50
3-30	1800	488	3.45
3-30	1815	483	3.44
3-31	0015	483	3.44
3-31	1015	444	3.40
3-31	1800	444	3.40
4-01	0015	471	3.43
4-01	0700	505	3.47
4-01	1800	505	3.47
4-01	2345	532	3.50
4-02	0015	532	3.50
4-02	0815	581	3.56
4-02	1800	553	3.53
4-03	0015	553	3.53
4-03	0745	598	3.58
4-03	1800	581	3.56
4-04	0015	581	3.56
4-04	1800	610	3.59
4-04	2400	727	3.84
4-05	0015	727	3.87
4-05	0030	733	3.89
4-05	0315	884	4.16
4-05	0545	1070	4.45
4-05	0600	1090	4.48
4-05	0800	1320	4.81
4-05	0945	1640	5.25
4-05	1145	2010	5.72
4-05	1400	2440	6.23
4-05	1615	2950	6.80
4-05	1800	3200	7.07
4-05	2400	3820	7.73
4-06	0030	3840	7.75
4-06	0200	4180	8.09
4-06	0400	4260	8.17
4-06	0600	4070	7.98
4-06	1800	3650	7.55
4-06	2400	3440	7.33
4-07	0015	3430	7.32
4-07	0600	3230	7.11
4-07	1400	2900	6.75
4-07	1800	2690	6.51
4-07	2400	2370	6.14
4-08	0015	2360	6.13
4-08	0500	2150	5.88
4-08	0600	2100	5.82
4-08	1715	1680	5.30
4-08	1800	1650	5.27
4-08	2345	1500	5.06
4-09	0015	1490	5.05
4-09	0800	1320	4.81
4-09	1800	1130	4.54
4-09	2400	1050	4.42
4-10	0015	1050	4.42
4-10	0600	985	4.32
4-10	1230	902	4.19
4-10	1800	853	4.11
4-10	2400	800	4.02
4-11	0015	800	4.02
4-11	0600	746	3.94
4-11	1800	720	3.81
4-11	2400	707	3.75



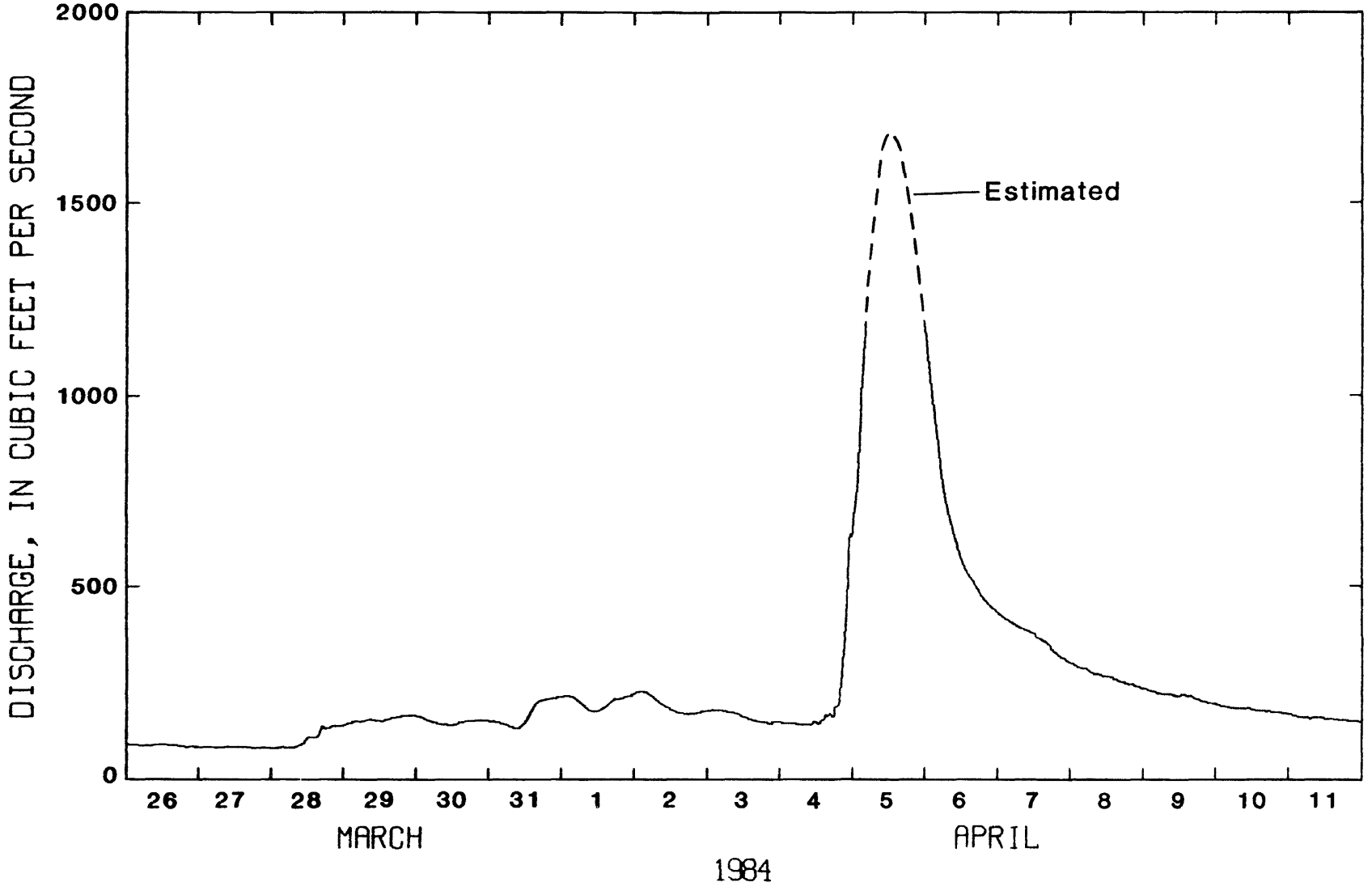
(Map No. 19) 01381000 Rockaway River below Reservoir at Boonton, NJ--continued

(20) 01381500 WHIPPANY RIVER AT MORRISTOWN, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	92	2.47
3-26	0600	89	2.45
3-26	1800	87	2.44
3-26	1930	85	2.43
3-27	0015	85	2.43
3-27	0545	82	2.41
3-27	1800	82	2.41
3-28	0015	82	2.41
3-28	0700	82	2.41
3-28	1115	101	2.52
3-28	1600	124	2.63
3-28	1645	140	2.70
3-28	1800	133	2.67
3-29	0015	143	2.71
3-29	1545	162	2.79
3-29	1800	165	2.80
3-29	1915	167	2.81
3-30	0015	165	2.80
3-30	1030	143	2.71
3-30	1800	152	2.75
3-30	2400	155	2.76
3-31	0815	136	2.68
3-31	1430	183	2.87
3-31	1800	205	2.95
3-31	2245	214	2.98
4-01	0200	217	2.99
4-01	0945	178	2.85
4-01	1800	208	2.96
4-01	2400	223	3.01
4-02	0215	229	3.03
4-02	1630	173	2.83
4-02	1800	173	2.83
4-03	0200	183	2.87
4-03	1800	150	2.74
4-03	2015	147	2.73
4-04	0530	145	2.72
4-04	1800	170	2.82
4-04	2000	223	3.01
4-04	2030	276	3.19
4-04	2115	348	3.43
4-04	2200	420	3.67
4-04	2230	521	3.97
4-04	2315	636	4.27
4-04	2400	644	4.29
4-05	0015	669	4.35
4-05	0145	784	4.64
4-05	0245	996	5.16
4-05	0445	1200	5.67
4-05	a1200	1680	b6.66
4-05	2300	1200	5.67
4-06	0015	1150	5.55
4-06	0300	951	5.05
4-06	0600	772	4.61
4-06	1030	612	4.21
4-06	1745	489	3.88
4-06	1800	486	3.87
4-06	2400	433	3.71
4-07	0015	433	3.71
4-07	0900	387	3.56
4-07	1800	336	3.39
4-07	2330	303	3.28
4-08	0015	300	3.27
4-08	1030	267	3.16
4-08	1800	249	3.10
4-08	2315	237	3.06
4-09	0015	234	3.05
4-09	1800	208	2.96
4-09	2245	197	2.92
4-10	0015	197	2.92
4-10	1800	178	2.85
4-10	2345	170	2.82
4-11	0015	170	2.82
4-11	1800	155	2.76
4-11	2300	150	2.74

a Estimated
b From floodmarks



(Map No. 20) 01381500 Whippany River at Morristown, NJ--continued

(21) 01381900 PASSAIC RIVER AT PINE BROOK, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	1390	16.67
3-26	0600	1370	16.59
3-26	1800	1300	16.41
3-26	2400	1270	16.32
3-27	0015	1270	16.32
3-27	1800	1180	16.03
3-27	2400	1150	15.92
3-28	0015	1150	15.92
3-28	1445	1080	15.67
3-28	1800	1080	15.69
3-29	0015	1090	15.71
3-29	0930	1150	15.92
3-30	--	a1400	--
3-31	--	a1720	--
4-01	--	a1920	--
4-02	--	a2170	--
4-03	--	a2250	--
4-04	--	a2410	--
4-05	--	a4040	--
4-06	--	a6030	--
4-07	0845	a7910	22.85
4-07	1130	b8000	22.90
4-07	1800	--	22.83
4-08	0015	a7610	22.70
4-08	1445	--	22.22
4-08	1515	--	21.89
4-09	--	a6630	--
4-10	--	a5550	--
4-11	--	a4410	--

a Estimated daily mean discharge
b Peak discharge may not have occurred at same time as maximum gage height due to variable backwater

(22) 01382500 PEQUANNOCK RIVER AT MACOPIN INTAKE DAM, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	170	13.90
3-26	0600	161	13.89
3-26	1600	128	13.85
3-26	1800	136	13.86
3-27	0015	128	13.85
3-27	0915	106	13.82
3-27	1800	100	13.81
3-27	2015	93	13.80
3-28	0015	93	13.80
3-28	1000	93	13.80
3-28	1600	121	13.84
3-28	1800	128	13.85
3-28	2030	161	13.89
3-28	2330	194	13.93
3-29	0015	186	13.92
3-29	0630	407	14.18
3-29	0715	285	14.04
3-29	1215	356	14.12
3-29	1245	242	13.99
3-29	1400	294	14.05
3-29	1530	234	13.98
3-29	1630	303	14.06
3-29	1800	276	14.03
3-29	2345	348	14.11
3-30	0015	294	14.05
3-30	0030	250	14.00
3-30	0600	194	13.93
3-30	1800	161	13.89
3-30	2145	144	13.87
3-31	0015	144	13.87
3-31	0400	128	13.85
3-31	0600	128	13.85
3-31	1130	114	13.83
3-31	1800	128	13.85
4-01	0015	128	13.85
4-01	1400	128	13.85
4-01	1800	153	13.88
4-01	1900	161	13.89
4-02	0015	161	13.89
4-02	150C	186	13.92
4-02	1800	194	13.93
4-02	2215	210	13.95
4-03	0015	210	13.95
4-03	1500	234	13.98
4-03	1800	250	14.00
4-03	2030	303	14.06
4-03	2100	399	14.17
4-03	2145	478	14.26
4-03	2230	250	14.00
4-03	2300	218	13.96
4-04	0545	303	14.06
4-04	0600	312	14.07
4-04	0845	234	13.98
4-04	0915	202	13.94
4-04	1415	294	14.05
4-04	1500	382	14.15
4-04	1630	267	14.02
4-04	1800	234	13.98
4-04	1915	294	14.05
4-04	1930	639	14.43
4-04	2000	348	14.11
4-04	2015	267	14.02
4-04	2115	543	14.33
4-04	2145	365	14.13
4-04	2200	285	14.04
4-04	2215	451	14.23
4-04	2245	552	14.34
4-05	0045	868	14.65
4-05	0330	639	14.43
4-05	0345	433	14.21
4-05	0400	321	14.08
4-05	0415	136	13.86
4-05	0430	0	13.21
4-05	0445	0	12.60
4-05	0600	0	13.25
4-05	0700	46	13.69
4-05	0800	365	14.13
4-05	0900	783	14.57
4-05	1000	3330	16.19
4-05	1200	3600	16.32
4-05	1400	4400	16.69
4-05	1600	4220	16.61
4-05	1800	4040	16.53
4-05	1945	4880	16.90
4-05	2200	4150	16.58
4-05	2400	4400	16.69

(22) 01382500 PEQUANNOCK RIVER AT MACOPIN INTAKE DAM, NJ -- CONT'D

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

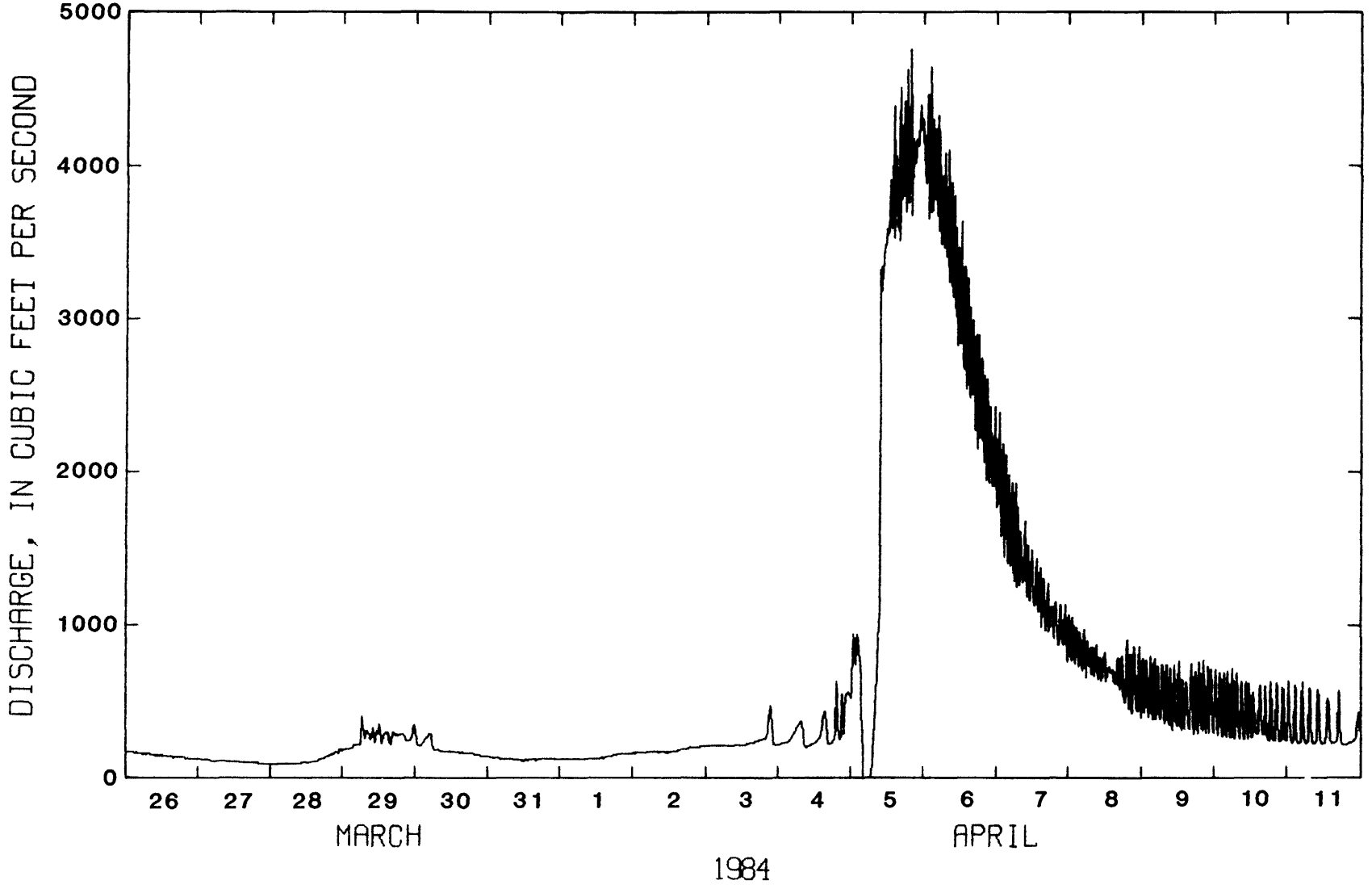
DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-06	0215	4650	16.80
4-06	0945	3150	16.10
4-06	1015	3810	16.42
4-06	1130	2820	15.93
4-06	1145	3470	16.26
4-06	1315	2670	15.85
4-06	1345	3350	16.20
4-06	1415	2540	15.78
4-06	1430	3190	16.12
4-06	1515	2490	15.75
4-06	1530	3070	16.06
4-06	1700	2270	15.63
4-06	1730	2900	15.97
4-06	1800	2150	15.56
4-06	1830	2900	15.97
4-06	1900	2220	15.60
4-06	1930	2740	15.89
4-06	2000	2070	15.51
4-06	2015	2630	15.83
4-06	2045	1950	15.44
4-06	2115	2610	15.82
4-06	2145	1940	15.43
4-06	2215	2430	15.72
4-06	2245	1920	15.42
4-06	2345	2430	15.72
4-07	0015	1780	15.33
4-07	0115	2400	15.70
4-07	0130	1890	15.40
4-07	0245	1450	15.12
4-07	0300	1890	15.40
4-07	0345	1410	15.09
4-07	0400	1740	15.31
4-07	0600	1300	15.01
4-07	0615	1760	15.32
4-07	0700	1260	14.98
4-07	0715	1670	15.26
4-07	0800	1270	14.99
4-07	0815	1620	15.23
4-07	0900	1280	15.00
4-07	0945	1680	15.27
4-07	1015	1190	14.93
4-07	1045	1530	15.17
4-07	1115	1160	14.91
4-07	1200	1500	15.15
4-07	1230	1160	14.91
4-07	1330	1440	15.11
4-07	1400	1090	14.85
4-07	1430	1330	15.03
4-07	1515	990	14.76
4-07	1545	1310	15.02
4-07	1630	968	14.74
4-07	1700	1160	14.91
4-07	1800	1020	14.79
4-07	2345	762	14.55
4-07	2400	956	14.73
4-08	0015	1070	14.83
4-08	0215	751	14.54
4-08	0230	923	14.70
4-08	0315	731	14.53
4-08	0345	956	14.74
4-08	0430	731	14.53
4-08	0500	912	14.70
4-08	0545	659	14.46
4-08	0600	857	14.65
4-08	0730	680	14.48
4-08	0800	857	14.65
4-08	0845	669	14.47
4-08	0915	847	14.64
4-08	1000	649	14.45
4-08	1030	793	14.59
4-08	1230	630	14.43
4-08	1600	762	14.56
4-08	1645	581	14.38
4-08	1715	772	14.57
4-08	1800	562	14.36
4-08	1900	804	14.60
4-08	1930	620	14.42
4-08	1945	451	14.24
4-08	2015	814	14.61
4-08	2045	533	14.33
4-08	2100	425	14.21
4-08	2130	680	14.48
4-08	2145	868	14.66
4-08	2215	571	14.37
4-08	2245	442	14.23
4-08	2315	772	14.57
4-08	2345	591	14.39
4-08	2400	416	14.20
4-09	0030	762	14.56
4-09	0100	515	14.31
4-09	0145	772	14.57
4-09	0215	451	14.24

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-09	0300	804	14.60	4-09	2245	533	14.34
4-09	0330	451	14.24	4-09	2300	710	14.52
4-09	0415	731	14.53	4-09	2330	390	14.18
4-09	0445	533	14.33	4-09	2345	303	14.08
4-09	0500	382	14.16				
4-09	0530	731	14.53	4-10	0015	524	14.33
4-09	0600	442	14.23	4-10	0030	710	14.52
4-09	0645	741	14.54	4-10	0045	533	14.34
4-09	0715	524	14.32	4-10	0100	340	14.12
4-09	0730	382	14.16	4-10	0145	690	14.50
4-09	0800	659	14.46	4-10	0215	390	14.18
4-09	0845	399	14.18	4-10	0230	276	14.05
4-09	0930	700	14.50	4-10	0300	610	14.42
4-09	1000	515	14.32	4-10	0330	433	14.23
4-09	1015	356	14.14	4-10	0345	285	14.06
4-09	1045	496	14.30	4-10	0415	487	14.29
4-09	1100	741	14.55	4-10	0430	700	14.51
4-09	1115	562	14.37	4-10	0445	533	14.34
4-09	1130	390	14.18	4-10	0500	330	14.11
4-09	1215	600	14.41	4-10	0545	524	14.33
4-09	1230	772	14.58	4-10	0600	720	14.53
4-09	1245	552	14.36	4-10	0615	552	14.36
4-09	1300	356	14.14	4-10	0630	348	14.13
4-09	1330	610	14.42	4-10	0645	267	14.04
4-09	1400	433	14.23	4-10	0715	407	14.20
4-09	1415	321	14.10	4-10	0730	690	14.50
4-09	1430	533	14.34	4-10	0745	533	14.34
4-09	1530	356	14.14	4-10	0800	330	14.11
4-09	1615	571	14.38	4-10	0830	258	14.03
4-09	1630	751	14.56	4-10	0845	591	14.40
4-09	1645	562	14.37	4-10	0915	399	14.19
4-09	1700	348	14.13	4-10	0930	276	14.05
4-09	1715	285	14.06	4-10	1015	610	14.42
4-09	1730	630	14.44	4-10	1045	399	14.19
4-09	1800	478	14.28	4-10	1100	276	14.05
4-09	1815	330	14.11	4-10	1130	390	14.18
4-09	1845	543	14.35	4-10	1145	620	14.43
4-09	1900	762	14.57	4-10	1200	460	14.26
4-09	1930	390	14.18	4-10	1215	321	14.10
4-09	2000	312	14.09	4-10	1300	562	14.37
4-09	2015	591	14.40	4-10	1330	356	14.14
4-09	2030	772	14.58	4-10	1500	571	14.38
4-09	2045	533	14.34	4-10	1530	425	14.22
4-09	2100	348	14.13	4-10	1545	321	14.10
4-09	2130	469	14.27	4-10	1645	515	14.32
4-09	2145	731	14.54	4-10	1730	276	14.06
4-09	2200	562	14.37	4-10	1800	242	14.02
4-09	2215	356	14.14	4-10	1830	515	14.33

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-10	1845	630	14.45	4-11	0600	242	14.02
4-10	1900	399	14.20	4-11	0730	591	14.41
4-10	1915	267	14.05	4-11	0800	340	14.13
4-10	2030	620	14.44	4-11	0815	258	14.04
4-10	2100	373	14.17	4-11	1000	407	14.21
4-10	2115	258	14.04	4-11	1015	581	14.40
4-10	2230	591	14.41	4-11	1045	348	14.14
4-10	2300	348	14.14	4-11	1100	258	14.04
4-10	2315	258	14.04	4-11	1315	382	14.18
				4-11	1330	478	14.29
4-11	0030	469	14.28	4-11	1415	330	14.12
4-11	0045	639	14.46	4-11	1430	250	14.03
4-11	0100	433	14.24	4-11	1700	571	14.39
4-11	0115	276	14.06	4-11	1730	330	14.12
4-11	0245	610	14.43	4-11	1745	250	14.03
4-11	0315	340	14.13	4-11	1800	226	14.00
4-11	0330	258	14.04	4-11	1815	218	13.99
4-11	0500	515	14.33	4-11	2230	294	14.08
4-11	0515	630	14.45	4-11	2300	390	14.19
4-11	0530	416	14.22	4-11	2400	258	14.04
4-11	0545	267	14.05				



(Map No. 22) 01382500 Pequannock River at Macopin Intake Dam, NJ--continued

(L) 01383000 GREENWOOD LAKE AT AWOSTING, NJ

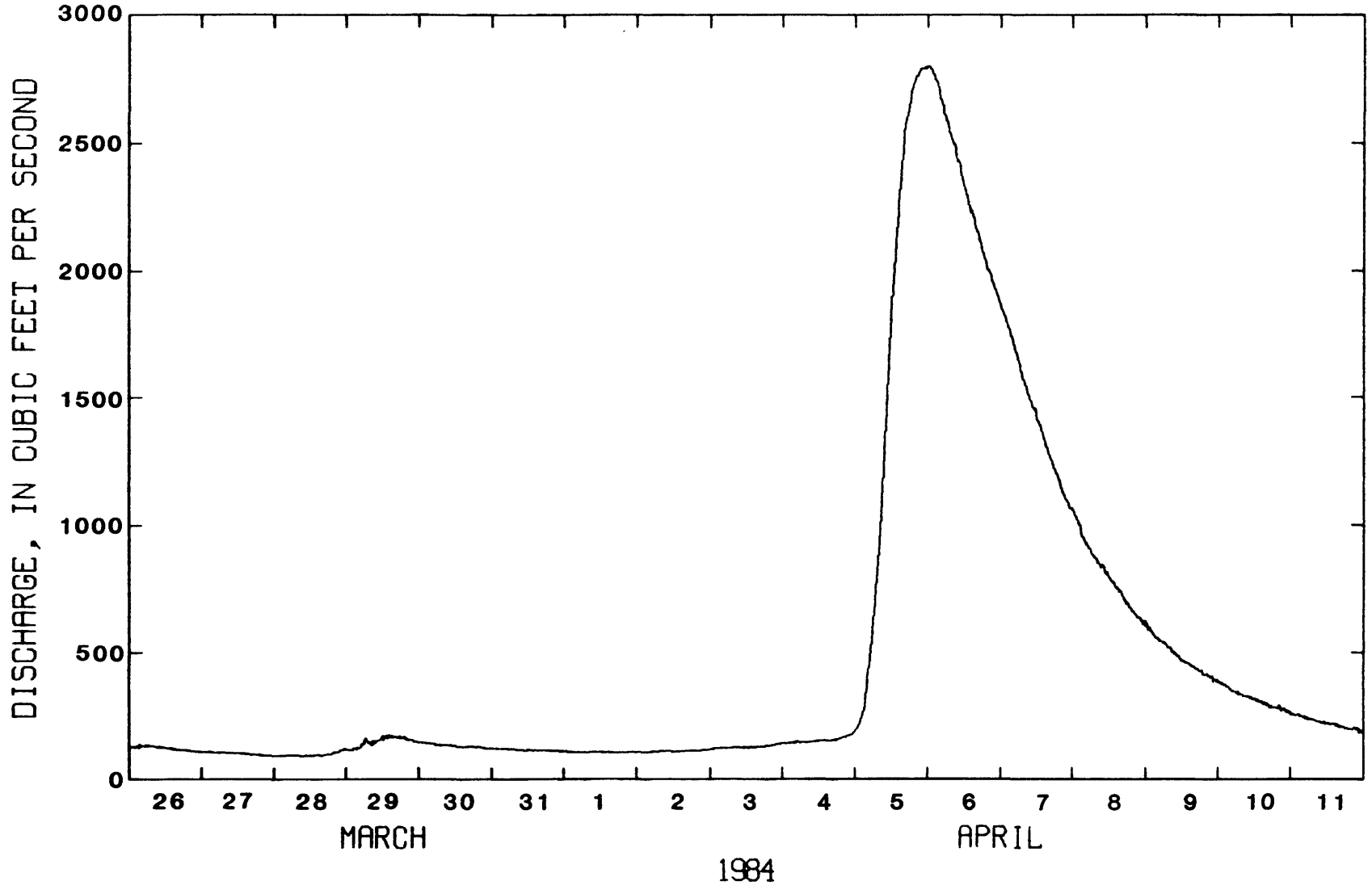
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0100	--	10.44
3-26	0300	--	10.45
3-26	0600	--	10.44
3-26	1800	--	10.38
3-26	2400	--	10.36
3-27	0100	--	10.37
3-27	1700	--	10.30
3-27	1800	--	10.33
3-28	0100	--	10.32
3-28	1800	--	10.33
3-28	2300	--	10.42
3-29	0600	--	10.40
3-29	0700	--	10.48
3-29	1400	--	10.56
3-29	1800	--	10.54
3-30	0100	--	10.40
3-30	0200	--	10.48
3-30	1300	--	10.45
3-30	1800	--	10.43
3-31	0200	--	10.44
3-31	1700	--	10.38
3-31	1800	--	10.40
4-01	0400	--	10.40
4-01	1300	--	10.36
4-01	1800	--	10.39
4-02	1200	--	10.38
4-02	1800	--	10.41
4-02	2200	--	10.42
4-03	0100	--	10.42
4-03	1800	--	10.45
4-03	2300	--	10.48
4-04	0100	--	10.48
4-04	1800	--	10.51
4-04	2400	--	10.62
4-05	0100	--	10.62
4-05	0300	--	10.76
4-05	0400	--	10.84
4-05	0500	--	11.03
4-05	0600	--	11.16
4-05	0700	--	11.29
4-05	0800	--	11.44
4-05	0900	--	11.58
4-05	1000	--	11.75
4-05	1200	--	12.11
4-05	1400	--	12.39
4-05	1800	--	12.83
4-05	2100	--	12.92
4-06	0100	--	12.89
4-06	1800	--	12.32
4-06	2400	--	12.11
4-07	0100	--	12.07
4-07	0600	--	11.93
4-07	1600	--	11.67
4-07	1800	--	11.63
4-07	2400	--	11.53
4-08	0100	--	11.50
4-08	0300	--	11.45
4-08	0600	--	11.36
4-08	1700	--	11.21
4-08	1800	--	11.19
4-08	2400	--	11.10
4-09	0100	--	11.12
4-09	0400	--	11.06
4-09	0600	--	11.06
4-09	1800	--	10.91
4-09	2400	--	10.87
4-10	0100	--	10.85
4-10	0600	--	10.81
4-10	1800	--	10.71
4-10	2200	--	10.70
4-11	0200	--	10.69
4-11	1100	--	10.63
4-11	1800	--	10.57
4-11	2300	--	10.55

(23) 01383500 WANAQUE RIVER AT AWOSTING, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	127	2.78
3-26	0345	138	2.83
3-26	0600	134	2.81
3-26	1800	114	2.72
3-26	2200	110	2.70
3-27	0230	112	2.71
3-27	1800	97	2.63
3-27	2100	93	2.61
3-28	0845	92	2.60
3-28	1800	99	2.64
3-28	2215	118	2.74
3-28	2330	123	2.76
3-29	0615	146	2.86
3-29	1415	176	2.98
3-29	1800	163	2.93
3-30	0045	148	2.87
3-30	1530	129	2.79
3-30	1800	127	2.78
3-30	2215	123	2.76
3-31	0115	125	2.77
3-31	1400	112	2.71
3-31	1800	114	2.72
4-01	0015	114	2.72
4-01	1115	106	2.68
4-01	1800	106	2.68
4-02	0115	108	2.69
4-02	1800	116	2.73
4-02	2330	121	2.75
4-03	0015	121	2.75
4-03	1800	132	2.80
4-03	2330	141	2.84
4-04	0015	141	2.84
4-04	1630	158	2.91
4-04	1800	158	2.91
4-04	2400	188	3.02
4-05	0015	194	3.04
4-05	0200	236	3.17
4-05	0315	288	3.31
4-05	0400	347	3.45
4-05	0445	426	3.62
4-05	0530	515	3.79
4-05	0600	590	3.92
4-05	0700	754	4.19
4-05	0815	931	4.49
4-05	0915	1160	4.79
4-05	1015	1390	5.08
4-05	1130	1710	5.45
4-05	1315	2060	5.85
4-05	1600	2480	6.31
4-05	1800	2650	6.49
4-05	2315	2800	6.65
4-06	0015	2800	6.65
4-06	1715	2120	5.91
4-06	1800	2090	5.88
4-06	2400	1870	5.64
4-07	0015	1860	5.63
4-07	0530	1670	5.41
4-07	0600	1640	5.38
4-07	1500	1310	4.98
4-07	1800	1220	4.87
4-07	2400	1060	4.67
4-08	0015	1060	4.67
4-08	0245	974	4.55
4-08	0600	897	4.44
4-08	1645	712	4.12
4-08	1800	700	4.10
4-08	2400	608	3.95
4-09	0030	621	3.97
4-09	0400	554	3.86
4-09	0600	537	3.83
4-09	1800	426	3.62
4-09	2230	384	3.53
4-10	0030	384	3.53
4-10	0600	338	3.43
4-10	1800	280	3.29
4-10	2345	257	3.23
4-11	0015	261	3.24
4-11	1000	222	3.13
4-11	1800	200	3.06
4-11	2230	182	3.00

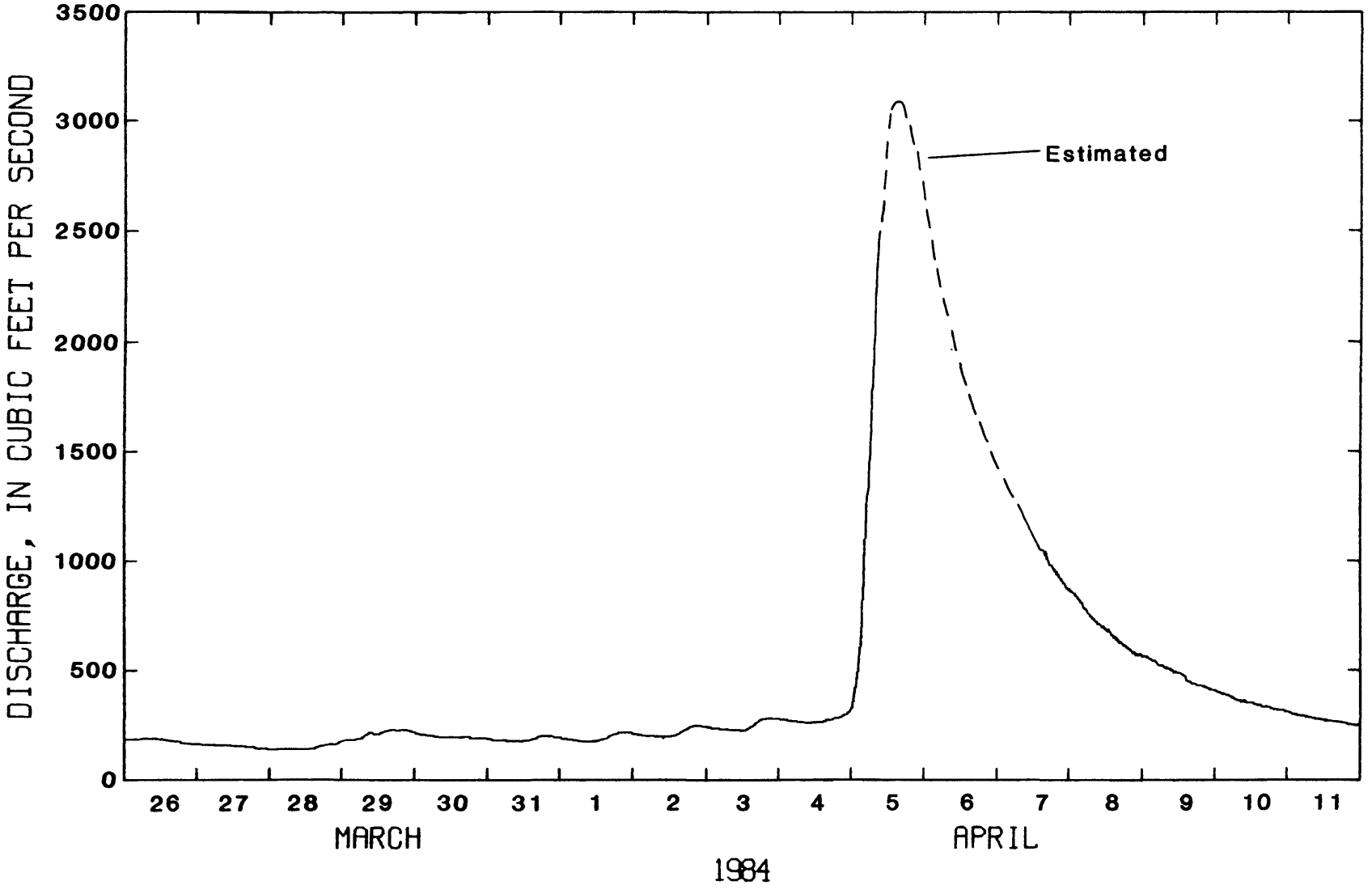


(Map No. 23) 01383500 Wanaque River at Awosting, NJ--continued

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	188	0.96
3-26	0600	192	0.97
3-26	1800	175	0.93
3-26	2215	167	0.91
3-27	0015	167	0.91
3-27	1800	150	0.87
3-27	2330	142	0.85
3-28	0015	142	0.85
3-28	1200	142	0.85
3-28	1800	159	0.89
3-28	2315	175	0.93
3-29	0015	179	0.94
3-29	0530	192	0.97
3-29	0600	192	0.97
3-29	1615	233	1.07
3-29	1800	229	1.06
3-30	0015	217	1.03
3-30	0800	201	0.99
3-30	1800	196	0.98
3-30	1815	192	0.97
3-31	0630	179	0.94
3-31	1400	179	0.94
3-31	1745	201	0.99
3-31	1800	201	0.99
4-01	0830	175	0.93
4-01	1200	175	0.93
4-01	1800	209	1.01
4-01	1915	217	1.03
4-02	1000	192	0.97
4-02	1200	196	0.98
4-02	1800	237	1.08
4-02	2000	250	1.11
4-03	0730	229	1.06
4-03	1300	229	1.06
4-03	1800	276	1.17
4-03	2000	285	1.19
4-04	0900	263	1.14
4-04	1400	267	1.15
4-04	1800	281	1.18
4-04	2400	323	1.27
4-05	0015	328	1.28
4-05	0030	338	1.30
4-05	0130	427	1.47
4-05	0230	547	1.67
4-05	0315	670	1.84
4-05	0400	852	2.07
4-05	0445	1060	2.34
4-05	0530	1310	2.63
4-05	0600	1430	2.77
4-05	0700	1750	3.13
4-05	0815	2130	3.58
4-05	a1400	3100	b4.84
4-05	2400	a2600	----
4-06	1200	a2100	----
4-06	2400	a1600	----
4-07	0500	1360	2.69
4-07	1315	1080	2.36
4-07	1800	983	2.24
4-07	2400	867	2.09
4-08	0015	874	2.10
4-08	0445	783	1.98
4-08	0600	758	1.95
4-08	1800	611	1.76
4-08	2400	561	1.69
4-09	0015	561	1.69
4-09	1030	488	1.58
4-09	1800	432	1.48
4-09	2330	406	1.43
4-10	0015	406	1.43
4-10	1400	343	1.31
4-10	1800	333	1.29
4-10	2300	314	1.25
4-11	0015	314	1.25
4-11	1645	263	1.14
4-11	1800	259	1.13
4-11	2130	250	1.11

a Estimated
b From floodmarks



(Map No. 24) 01384000 Wanaque River at Monks, NJ--contined

(25) 01387000 WANAQUE RIVER AT WANAQUE, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

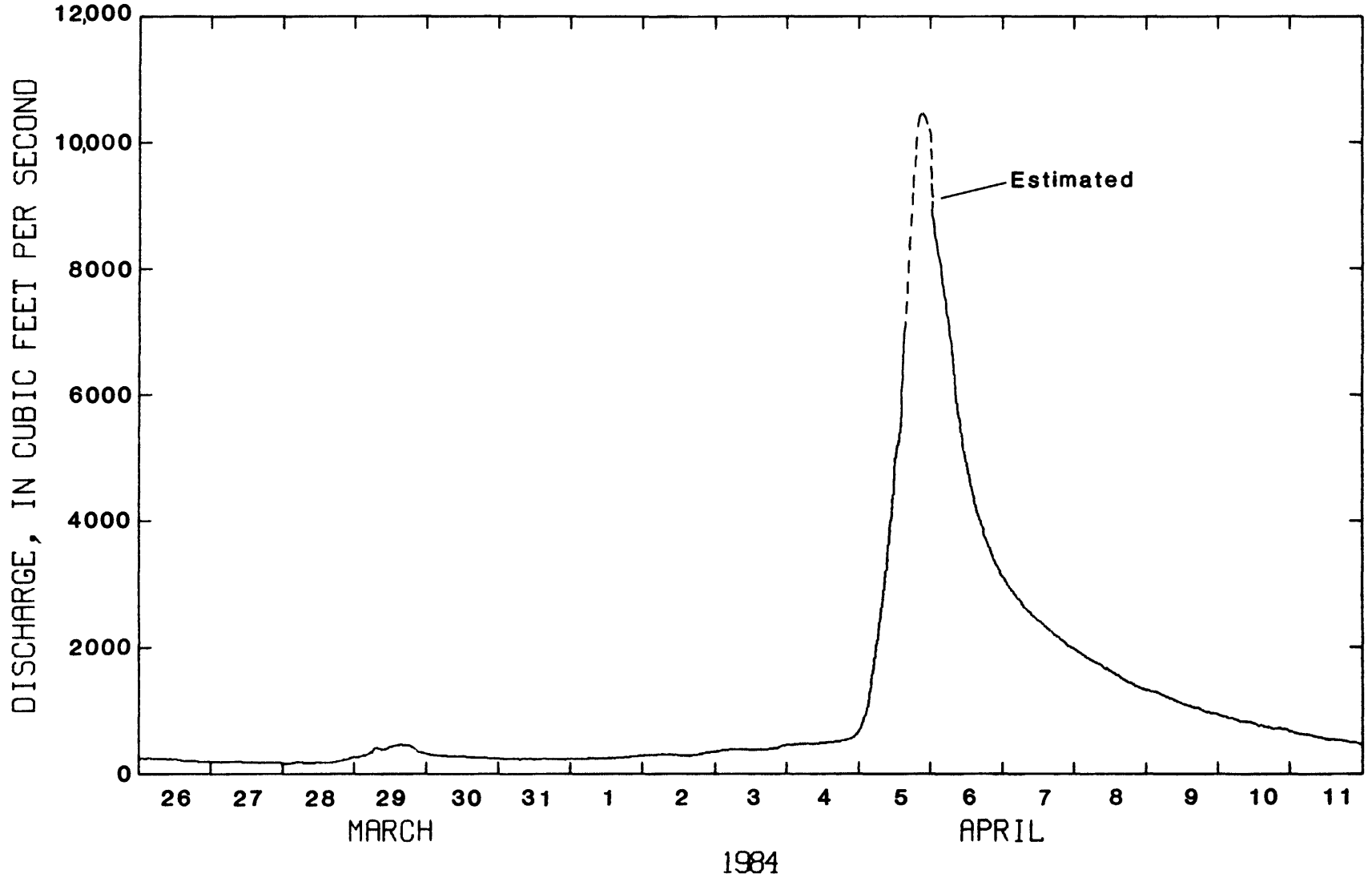
DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	236	2.80
3-26	0345	257	2.90
3-26	0600	242	2.83
3-26	1800	207	2.66
3-26	2045	198	2.61
3-27	0500	200	2.62
3-27	1800	182	2.53
3-27	2330	177	2.50
3-28	0045	175	2.49
3.28	0800	175	2.49
3-28	1800	201	2.63
3-28	2215	247	2.85
3-28	2345	264	2.93
3-29	0015	264	2.93
3-29	0345	300	3.08
3-29	0600	355	3.28
3-29	1130	427	3.52
3-29	1545	477	3.67
3-29	1800	460	3.62
3-29	2100	363	3.31
3-30	0015	316	3.14
3-30	0330	290	3.04
3-30	0600	290	3.04
3-30	1800	255	2.89
3-30	2215	244	2.84
3-31	0700	238	2.81
3-31	0830	249	2.86
3-31	1800	236	2.80
3-31	1930	232	2.78
4-01	0015	240	2.82
4-01	1200	247	2.85
4-01	1800	264	2.93
4-01	2400	295	3.06
4-02	0700	311	3.12
4-02	1345	293	3.05
4-02	1800	311	3.12
4-02	2400	355	3.28
4-03	0015	355	3.28
4-03	0245	375	3.35
4-03	0600	384	3.38
4-03	1800	392	3.41
4-03	2400	456	3.61
4-04	0015	456	3.61
4-04	0330	474	3.66
4-04	0600	481	3.68
4-04	1800	524	3.80
4-04	2000	542	3.85
4-04	2330	637	4.09
4-04	2400	666	4.16
4-05	0015	692	4.22
4-05	0100	768	4.39
4-05	0215	945	4.76
4-05	0315	1140	5.13
4-05	0415	1390	5.54
4-05	0515	1690	5.98
4-05	0600	1990	6.39
4-05	0715	2430	6.93
4-05	0845	2960	7.46
4-05	1000	3550	7.95
4-05	1130	4330	8.44
4-05	1315	5230	8.94
4-05	1500	6300	9.44
4-05	1600	7080	9.74
4-05	1700	7110	9.75
4-05	1800	a8300	9.42
4-05	1945	9100	10.41
4-05	2115	10500	10.82
4-06	0030	9070	10.40
4-06	0430	7590	9.92
4-06	0600	7250	9.80
4-06	0915	5720	9.19
4-06	1330	4570	8.58
4-06	1800	3800	8.11
4-06	2400	3130	7.61
4-07	0015	3120	7.60
4-07	0130	3030	7.52
4-07	0600	2730	7.25
4-07	1800	2190	6.64
4-07	2400	1980	6.37
4-08	0015	1970	6.36
4-08	0730	1750	6.07
4-08	1800	1460	5.65
4-08	2400	1330	5.44

(25) 01387000 WANAQUE RIVER AT WANAQUE, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-09	0015	1330	5.44	4-10	1800	718	4.28
4-09	0945	1160	5.16	4-10	2400	670	4.17
4-09	1800	1030	4.92				
4-09	2345	935	4.74	4-11	0015	670	4.17
				4-11	1045	573	3.93
4-10	0015	930	4.73	4-11	1800	524	3.80
4-10	1015	820	4.50	4-11	2400	474	3.66

a Estimated flow, stage-discharge relationship unstable.

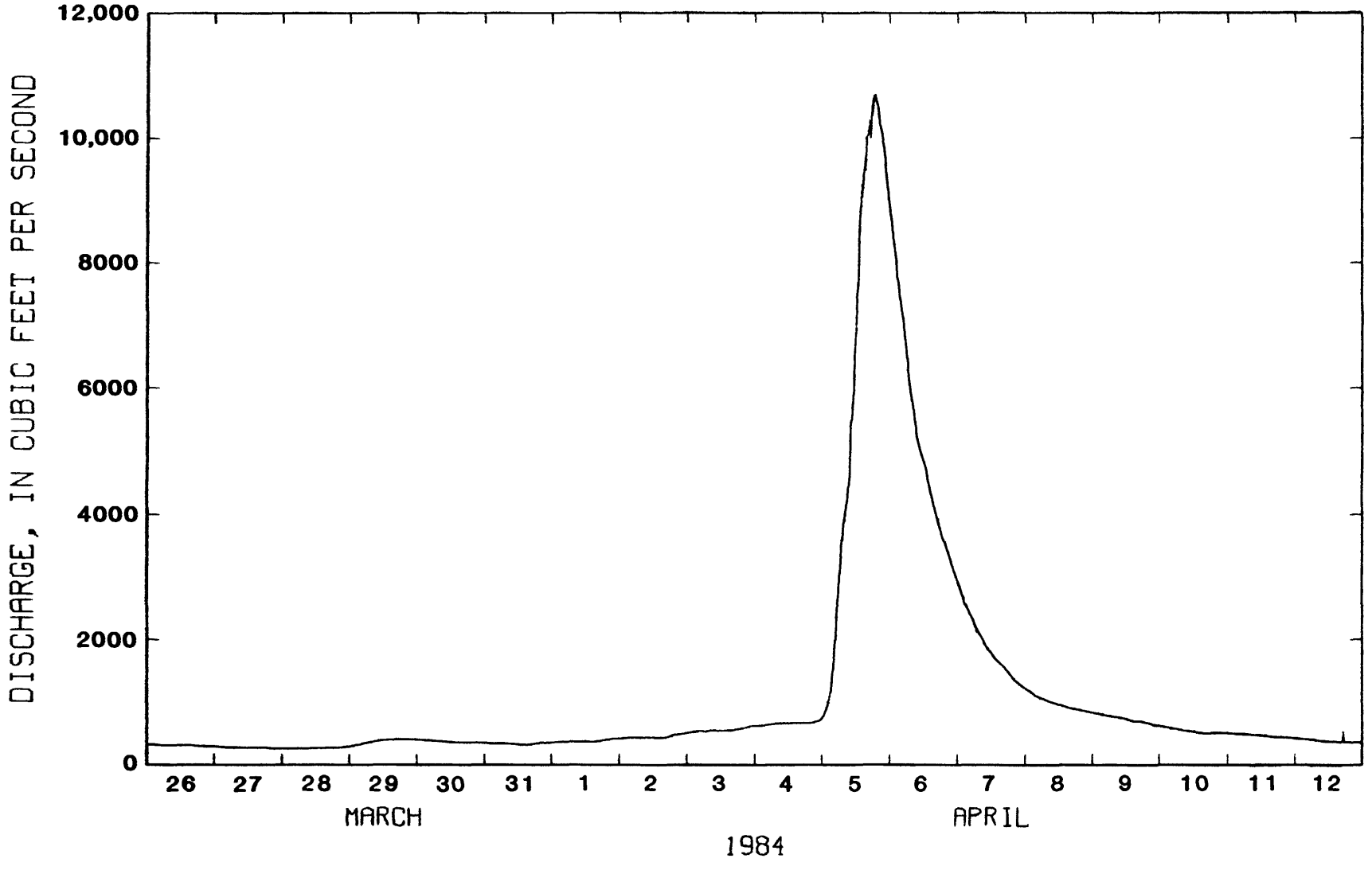


(Map NO. 25) 01387000 Wanaque River at Wanaque, NJ--continued

(26) 01387400 RAMAPO RIVER AT RAMAPO, NY

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	322	2.78
3-26	1800	298	2.70
3-26	2300	287	2.65
3-27	1800	264	2.58
3-27	2215	258	2.56
3-28	0430	254	2.55
3-28	1800	258	2.56
3-28	2400	295	2.69
3-29	0145	310	2.74
3-29	0600	344	2.86
3-29	1615	413	3.08
3-29	1800	413	3.08
3-30	0015	407	3.06
3-30	1700	347	2.87
3-30	1800	347	2.87
3-31	1115	322	2.78
3-31	1800	338	2.84
3-31	2130	354	2.89
4-01	0015	354	2.89
4-01	0800	370	2.94
4-01	1800	383	2.99
4-01	2145	413	3.08
4-02	0015	413	3.08
4-02	1800	452	3.20
4-02	2300	496	3.33
4-03	0800	541	3.46
4-03	1615	556	3.50
4-03	1800	560	3.52
4-03	2230	612	3.65
4-04	0015	612	3.65
4-04	1800	662	3.78
4-04	2400	735	3.97
4-05	0045	807	4.13
4-05	0215	995	4.52
4-05	0315	1260	5.01
4-05	0400	1570	5.55
4-05	0430	1890	6.05
4-05	0515	2460	6.85
4-05	0600	2980	7.51
4-05	0715	3630	8.28
4-05	0915	4390	9.10
4-05	1000	5300	9.50
4-05	1145	6430	10.51
4-05	1300	7820	11.66
4-05	1500	9480	12.92
4-05	1800	10400	13.60
4-05	1830	10700	13.82
4-06	0015	8820	12.43
4-06	0145	8270	12.01
4-06	0600	6500	10.57
4-06	1015	5140	9.35
4-06	1600	4080	8.30
4-06	1800	3760	7.96
4-06	2345	2990	7.10
4-06	2400	2970	7.07
4-07	0500	2370	6.32
4-07	0600	2250	6.16
4-07	1200	1790	5.52
4-07	1800	1490	5.06
4-07	2400	1210	4.70
4-08	0030	1190	4.68
4-08	0600	1040	4.47
4-08	1800	888	4.23
4-08	2315	827	4.13
4-09	0015	827	4.13
4-09	1430	701	3.91
4-09	1800	680	3.88
4-09	2345	617	3.80
4-10	1030	539	3.69
4-10	1530	511	3.65
4-10	1800	511	3.65
4-11	0015	511	3.65
4-11	1800	445	3.55
4-11	2345	420	3.51



(Map No. 26) 01387400 Ramapo River at Ramapo, NY--continued

(28) 01387420 RAMAPO RIVER AT SUFFERN, NY

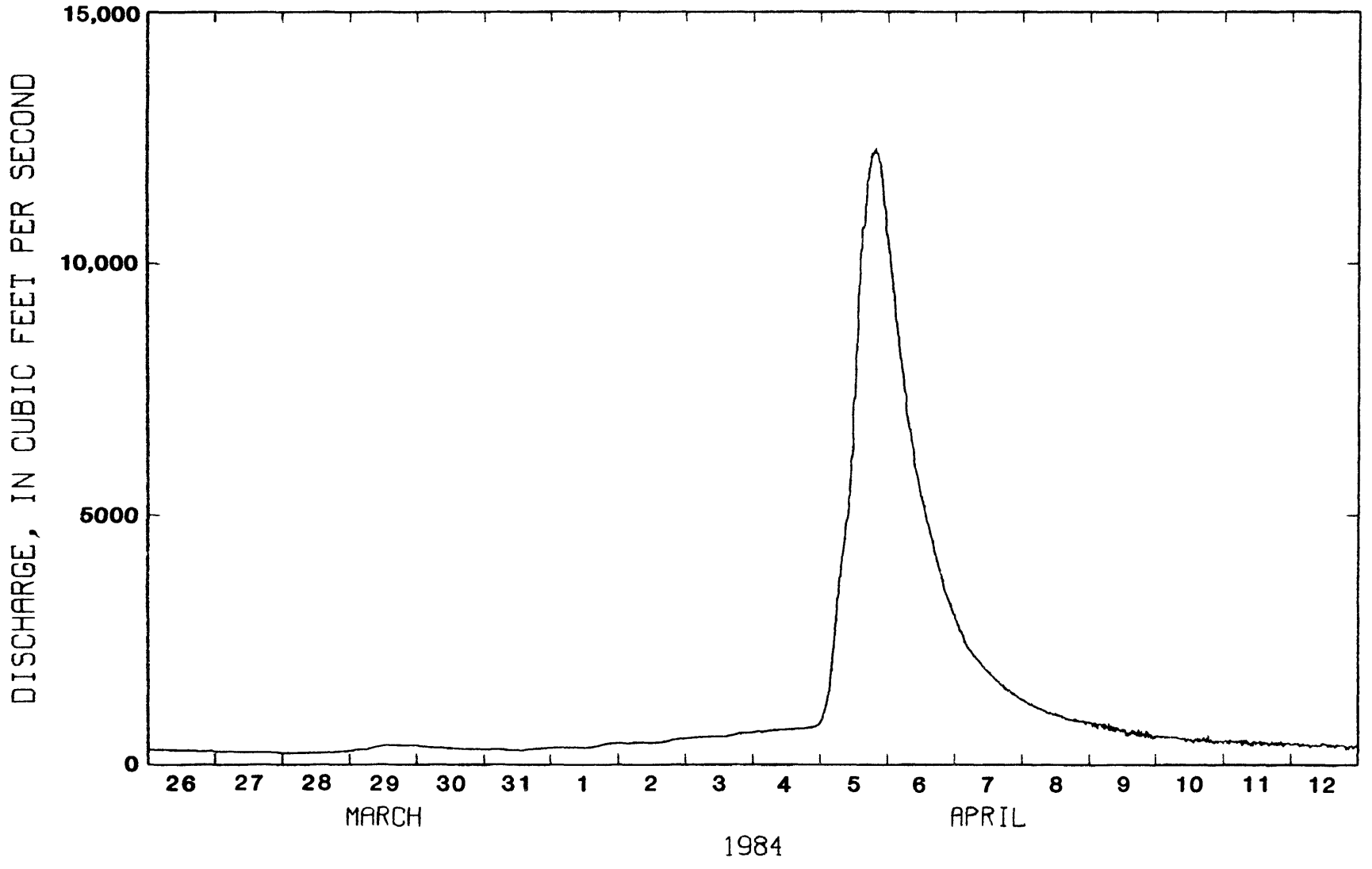
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	293	2.68
3-26	1800	268	2.59
3-26	2200	261	2.56
3-27	0015	263	2.57
3-27	1800	244	2.49
3-27	2230	237	2.46
3-28	0900	233	2.44
3-28	1800	251	2.52
3-28	2345	271	2.60
3-29	0015	273	2.61
3-29	0415	303	2.72
3-29	0600	313	2.75
3-29	1230	378	2.97
3-29	1800	386	3.00
3-29	1845	398	3.03
3-30	0030	378	2.97
3-30	1200	316	2.76
3-30	1800	316	2.76
3-30	2330	308	2.74
3-31	1315	290	2.67
3-31	1800	324	2.79
3-31	2045	342	2.85
4-01	0345	332	2.82
4-01	1245	340	2.84
4-01	1800	398	3.03
4-01	2315	421	3.11
4-02	0015	418	3.10
4-02	1100	424	3.12
4-02	1800	478	3.28
4-02	2215	531	3.43
4-03	0030	525	3.41
4-03	0745	580	3.57
4-03	1800	613	3.68
4-03	2400	655	3.82
4-04	0100	651	3.81
4-04	0800	704	3.97
4-04	1800	722	4.03
4-04	2130	751	4.12
4-04	2400	861	4.44
4-05	0015	892	4.53
4-05	0145	1120	5.14
4-05	0245	1410	5.85
4-05	0330	1700	6.51
4-05	0415	2080	7.28
4-05	0500	2590	8.16
4-05	0600	3300	9.28
4-05	0730	4000	10.16
4-05	0915	4870	10.91
4-05	1100	5970	11.75
4-05	1215	7480	12.77
4-05	1345	9100	13.73
4-05	1600	11100	14.79
4-05	1800	12100	15.25
4-05	1930	12300	15.38
4-06	0015	10500	14.46
4-06	0145	9510	13.96
4-06	0545	7590	12.84
4-06	0600	7510	12.79
4-06	1000	5980	11.76
4-06	1500	4760	10.82
4-06	1800	4090	10.24
4-06	2215	3240	9.42
4-06	2400	2980	9.14
4-07	0015	2910	9.06
4-07	0315	2540	8.63
4-07	0600	2240	8.20
4-07	1300	1770	7.27
4-07	1800	1510	6.72
4-07	2345	1300	6.23
4-08	0015	1290	6.22
4-08	0315	1190	5.97
4-08	0600	1120	5.80
4-08	1800	898	5.22
4-08	2245	823	5.01
4-09	0015	855	5.10
4-09	0530	711	4.68
4-09	0600	751	4.80
4-09	1330	596	4.32
4-09	1800	578	4.26
4-09	2245	524	4.08
4-09	2400	578	4.26
4-10	0800	521	4.07

(28) 01387420 RAMAPO RIVER AT SUFFERN, NY-- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-10	1315	445	3.80	4-10	2345	410	3.67
4-10	1645	542	4.14				
4-10	1800	487	3.95	4-11	0215	501	4.00
4-10	1815	590	4.30	4-11	2100	357	3.46
4-10	1900	456	3.84	4-11	2300	429	3.74



(Map No. 28) 01387420 Ramapo River at Suffern, NY--continued

(29) 01387450 MAHWAH RIVER NEAR SUFFERN, NY

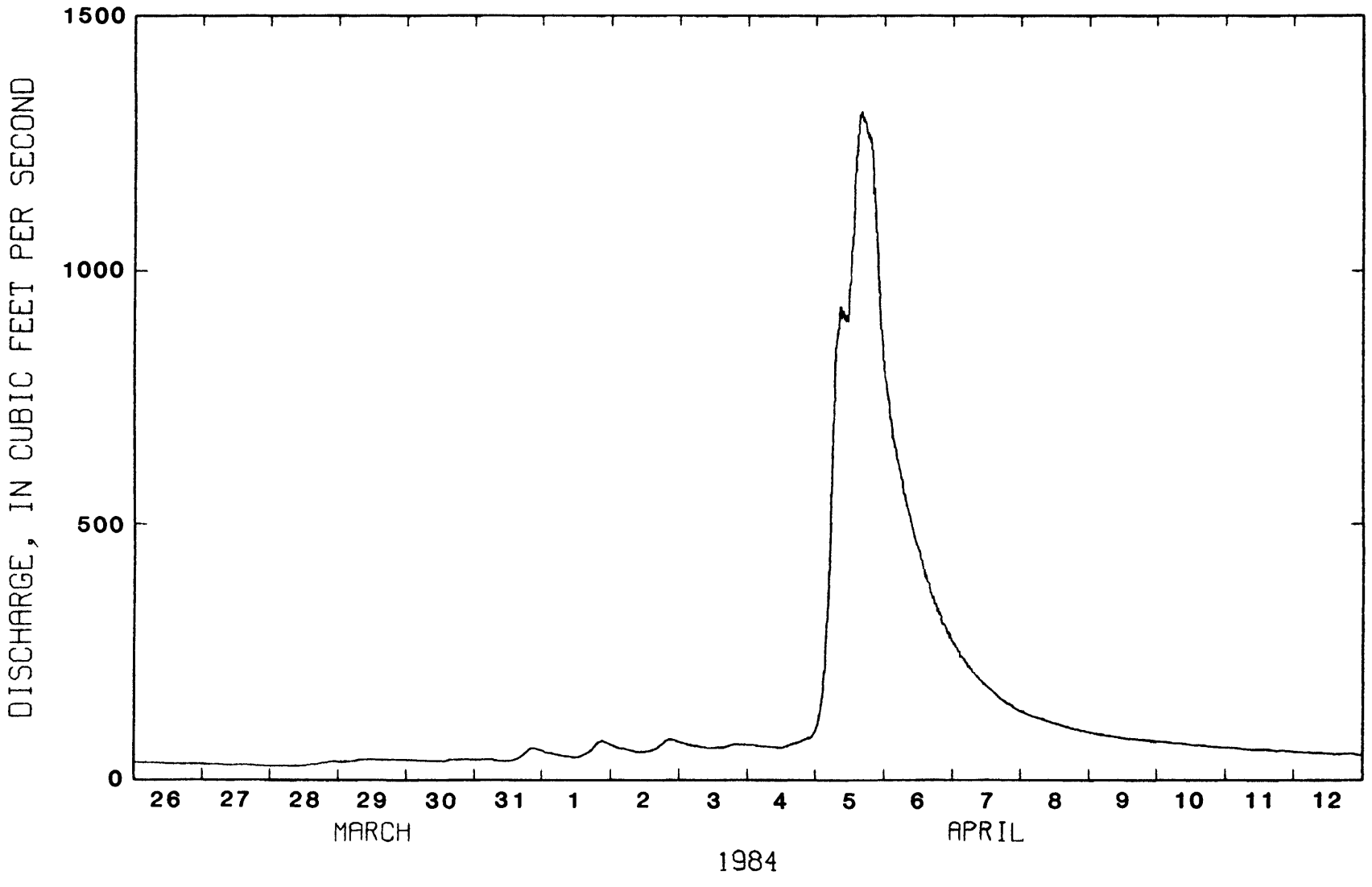
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	34	2.30
3-26	1715	30	2.25
3-26	1800	31	2.26
3-27	0015	30	2.25
3-27	1800	29	2.23
3-27	2145	28	2.21
3-28	0900	28	2.20
3-28	1800	32	2.27
3-28	2400	38	2.35
3-29	0015	37	2.34
3-29	0700	39	2.36
3-29	1800	39	2.38
3-29	1900	41	2.40
3-30	0715	37	2.33
3-30	1200	37	2.33
3-30	1800	39	2.38
3-30	1845	41	2.40
3-31	0915	37	2.33
3-31	1200	38	2.34
3-31	1645	47	2.49
3-31	1800	52	2.56
3-31	2030	63	2.69
4-01	0330	50	2.54
4-01	0600	48	2.50
4-01	1015	44	2.45
4-01	1200	45	2.46
4-01	1700	59	2.64
4-01	1800	64	2.71
4-01	2030	77	2.84
4-01	2045	78	2.85
4-02	0330	61	2.67
4-02	0600	59	2.64
4-02	1015	55	2.60
4-02	1800	71	2.78
4-02	2100	79	2.86
4-03	0015	74	2.81
4-03	1200	63	2.69
4-03	1800	68	2.75
4-03	2400	70	2.77
4-04	1115	63	2.70
4-04	1800	75	2.82
4-04	2315	93	2.99
4-04	2400	100	3.05
4-05	0015	103	3.08
4-05	0045	112	3.15
4-05	0145	145	3.39
4-05	0230	187	3.65
4-05	0300	225	3.86
4-05	0330	272	4.09
4-05	0415	353	4.44
4-05	0445	433	4.74
4-05	0515	529	5.06
4-05	0600	680	5.50
4-05	0700	843	5.98
4-05	1230	1020	6.55
4-05	1415	1240	7.26
4-05	1530	1310	7.49
4-05	1800	1260	7.35
4-05	2145	991	6.47
4-06	0015	790	5.83
4-06	0430	630	5.36
4-06	0600	591	5.25
4-06	1100	462	4.84
4-06	1600	368	4.50
4-06	1800	346	4.41
4-06	2345	274	4.10
4-07	0030	270	4.08
4-07	0615	219	3.83
4-07	1400	175	3.58
4-07	1800	157	3.47
4-07	2330	136	3.33
4-08	0015	135	3.32
4-08	0415	125	3.25
4-08	0600	123	3.23
4-08	1800	103	3.08
4-08	2400	94	3.00
4-09	0015	95	3.01
4-09	1300	82	2.89
4-09	1800	80	2.87
4-09	2215	76	2.83
4-10	0015	76	2.83

(29) 01387450 MAHWAH RIVER NEAR SUFFERN, NY-- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-10	1800	66	2.73	4-11	0500	62	2.69
4-10	2200	64	2.71	4-11	1800	58	2.64
				4-11	2400	55	2.61
4-11	0045	65	2.72				

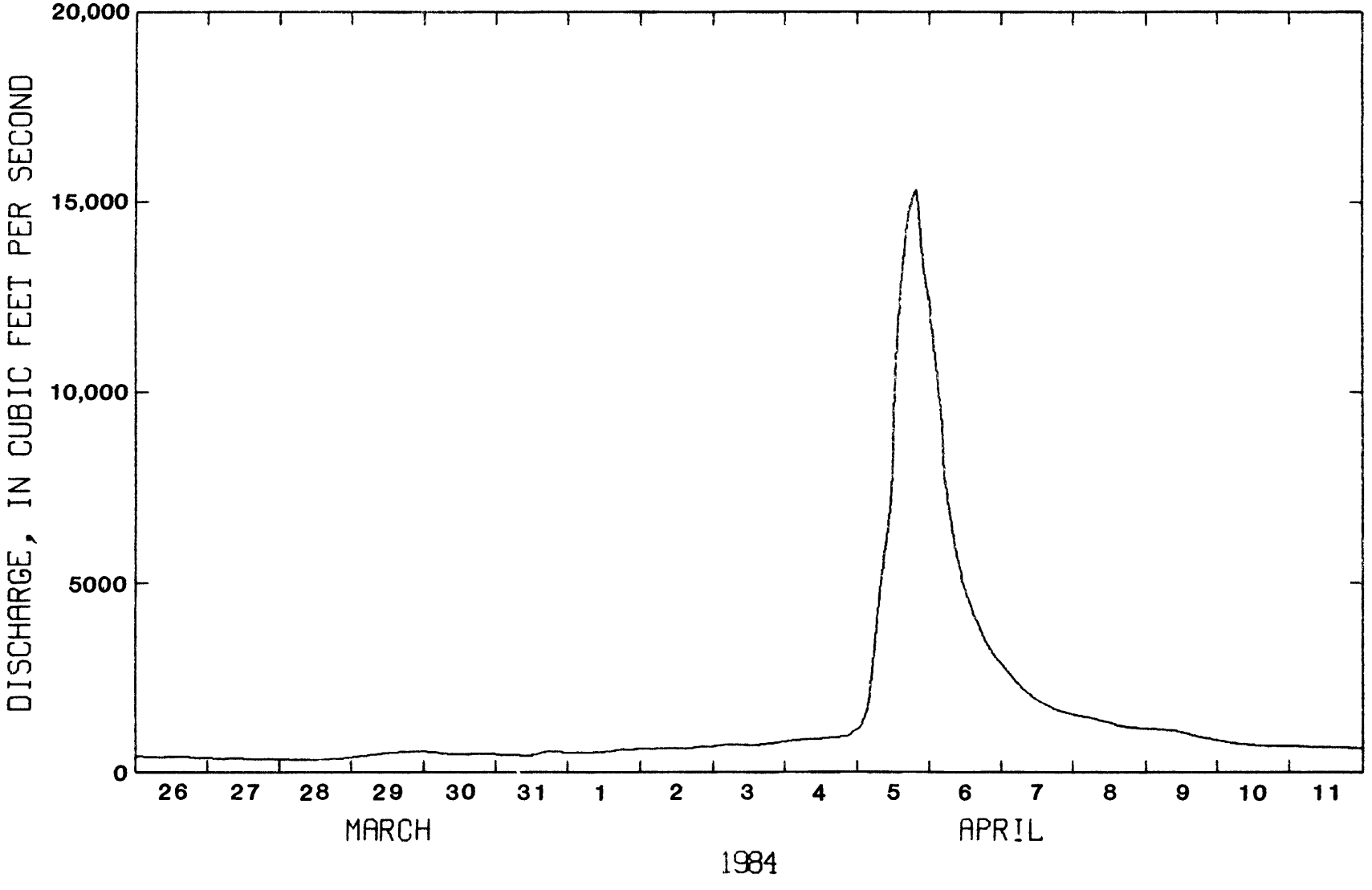


(Map No. 29) 01387450 Mahwah River near Suffern, NY--continued

(30) 01387500 RAMAPO RIVER NEAR MAHWAH, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	422	4.46
3-26	0600	410	4.42
3-26	1800	398	4.38
3-26	2330	384	4.33
3-27	0015	384	4.33
3-27	1800	350	4.21
3-27	2345	342	4.18
3-28	0615	334	4.15
3-28	1100	334	4.15
3-28	1800	364	4.26
3-28	2400	395	4.37
3-29	0430	437	4.51
3-29	0600	449	4.55
3-29	1545	540	4.83
3-29	1800	551	4.86
3-29	1830	554	4.87
3-30	0015	544	4.84
3-30	1145	481	4.65
3-30	1800	487	4.67
3-31	0915	452	4.56
3-31	1800	551	4.86
4-01	0745	527	4.79
4-01	1800	603	5.01
4-01	2145	619	5.06
4-02	0015	619	5.06
4-02	1300	623	5.07
4-02	1800	662	5.19
4-02	2300	696	5.29
4-03	0015	700	5.30
4-03	1800	756	5.46
4-03	2345	809	5.57
4-04	0015	809	5.57
4-04	1315	910	5.74
4-04	1800	935	5.78
4-04	2400	1120	6.19
4-05	0015	1130	6.25
4-05	0200	1360	6.88
4-05	0315	1660	7.43
4-05	0415	2000	7.88
4-05	0500	2530	8.41
4-05	0545	3140	8.95
4-05	0600	3340	9.09
4-05	0645	4040	9.52
4-05	0800	5030	10.04
4-05	0945	6080	10.52
4-05	1130	7540	11.10
4-05	1215	9540	11.77
4-05	1330	11600	12.38
4-05	1615	14100	13.03
4-05	1800	14900	13.21
4-05	1945	15500	13.35
4-06	0015	12400	12.59
4-06	0100	11800	12.42
4-06	0415	9190	11.66
4-06	0600	7400	11.05
4-06	0900	5890	10.44
4-06	1245	4650	9.85
4-06	1730	3700	9.32
4-06	1800	3640	9.28
4-06	2345	2910	8.75
4-06	2400	2880	8.73
4-07	0015	2860	8.71
4-07	0600	2310	8.21
4-07	1315	1850	7.69
4-07	1800	1670	7.44
4-07	2400	1530	7.19
4-08	0015	1530	7.19
4-08	1000	1330	6.88
4-08	1800	1190	6.69
4-08	2345	1140	6.56
4-09	0800	1090	6.41
4-09	1745	935	6.23
4-09	1800	935	6.23
4-09	2400	832	6.12
4-10	0815	745	6.01
4-10	1800	696	5.92
4-10	2030	693	5.91
4-11	0015	689	5.90
4-11	1800	646	5.79
4-11	2300	626	5.74

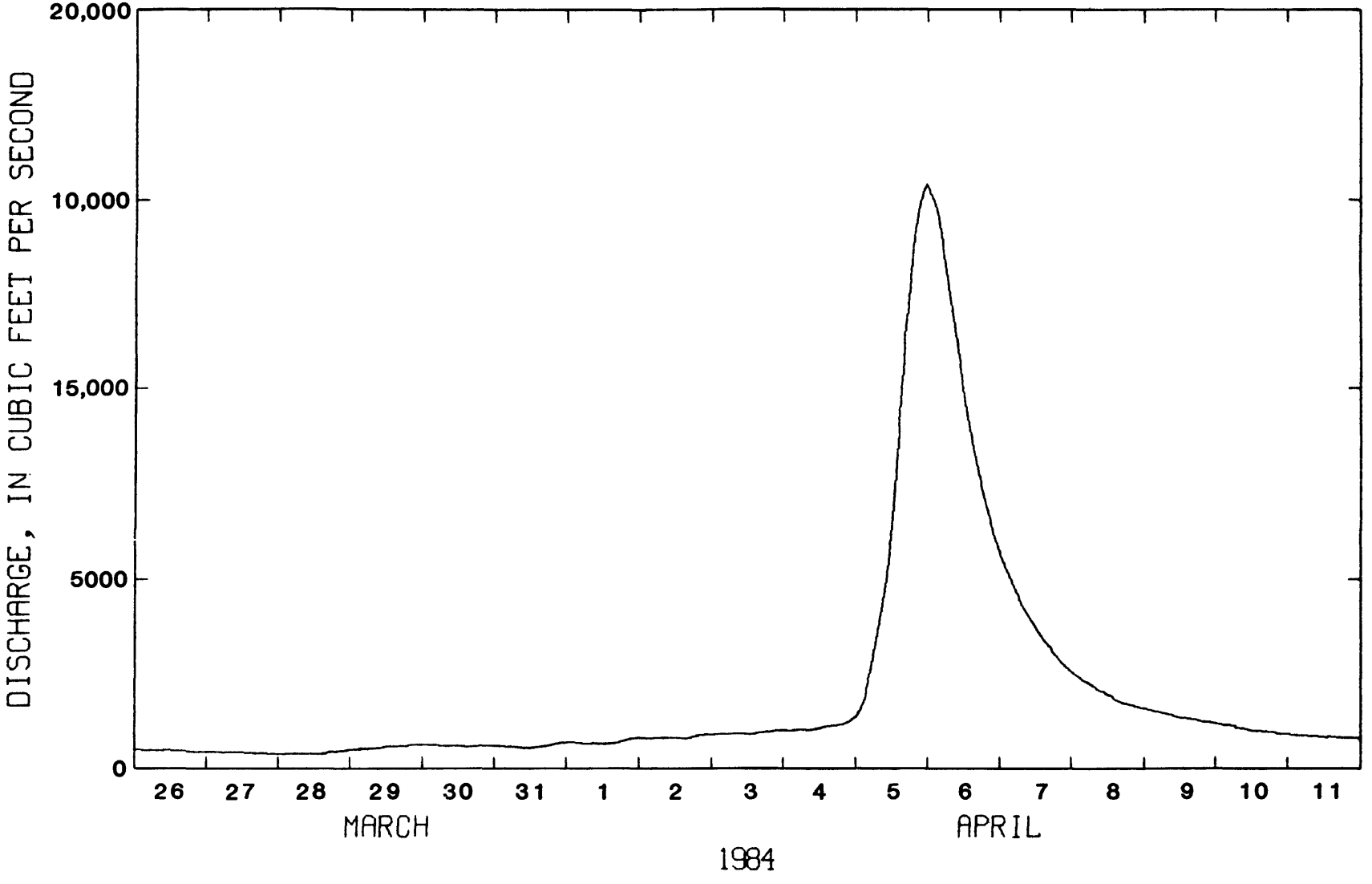


(Map No. 30) 01387500 Ramapo River near Mahwah, NJ--continued

(32) 01388000 RAMAPO RIVER AT POMPTON LAKES, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	505	10.67
3-26	0600	493	10.66
3-26	1800	455	10.63
3-26	2345	443	10.62
3-27	0015	455	10.63
3-27	1800	407	10.59
3-27	2030	396	10.58
3-28	0445	396	10.57
3-28	1500	396	10.58
3-28	1800	443	10.62
3-28	2215	480	10.65
3-29	0015	480	10.65
3-29	0715	545	10.71
3-29	1800	614	10.76
3-29	2230	629	10.78
3-30	0015	629	10.78
3-30	1415	585	10.74
3-30	1800	585	10.74
3-31	1000	558	10.72
3-31	1800	599	10.76
3-31	2230	704	10.83
4-01	1015	643	10.79
4-01	1745	719	10.83
4-01	1800	719	10.83
4-01	2245	816	10.89
4-02	1430	783	10.87
4-02	1800	849	10.90
4-02	2200	900	10.93
4-03	0015	900	10.93
4-03	1800	967	10.96
4-03	2045	1000	10.98
4-04	0015	1000	10.98
4-04	0700	1040	11.00
4-04	1800	1160	11.06
4-04	2200	1230	11.09
4-04	2400	1360	11.16
4-05	0015	1400	11.18
4-05	0215	1710	11.34
4-05	0345	2100	11.52
4-05	0500	2590	11.73
4-05	0600	3020	11.90
4-05	0730	3680	12.15
4-05	0915	4470	12.43
4-05	1100	5470	12.76
4-05	1215	6660	13.12
4-05	1330	8040	13.50
4-05	1500	9680	13.92
4-05	1645	11600	14.39
4-05	1800	12400	14.57
4-05	2130	14900	15.11
4-05	2330	15400	15.21
4-06	0015	15300	15.19
4-06	0400	14400	14.99
4-06	0845	11900	14.44
4-06	1000	11100	14.27
4-06	1300	9470	13.87
4-06	1745	7560	13.37
4-06	1800	7490	13.35
4-06	2315	5950	12.91
4-06	2400	5760	12.85
4-07	0015	5700	12.83
4-07	0515	4740	12.52
4-07	0600	4620	12.48
4-07	1230	3680	12.15
4-07	1800	3070	11.92
4-07	2400	2560	11.72
4-08	0200	2440	11.67
4-08	0600	2230	11.58
4-08	1600	1770	11.37
4-08	1800	1730	11.35
4-08	2300	1610	11.29
4-09	0030	1610	11.29
4-09	1115	1380	11.17
4-09	1800	1280	11.12
4-09	2345	1190	11.07
4-10	1200	1020	10.98
4-10	1800	967	10.95
4-10	2230	900	10.92
4-11	0015	900	10.92
4-11	1800	816	10.87
4-11	2330	783	10.85



(Map No. 32) 01388000 Ramapo River at Pompton Lakes, NJ--Continued

(33) 01388500 POMPTON RIVER AT POMPTON PLAINS, NJ

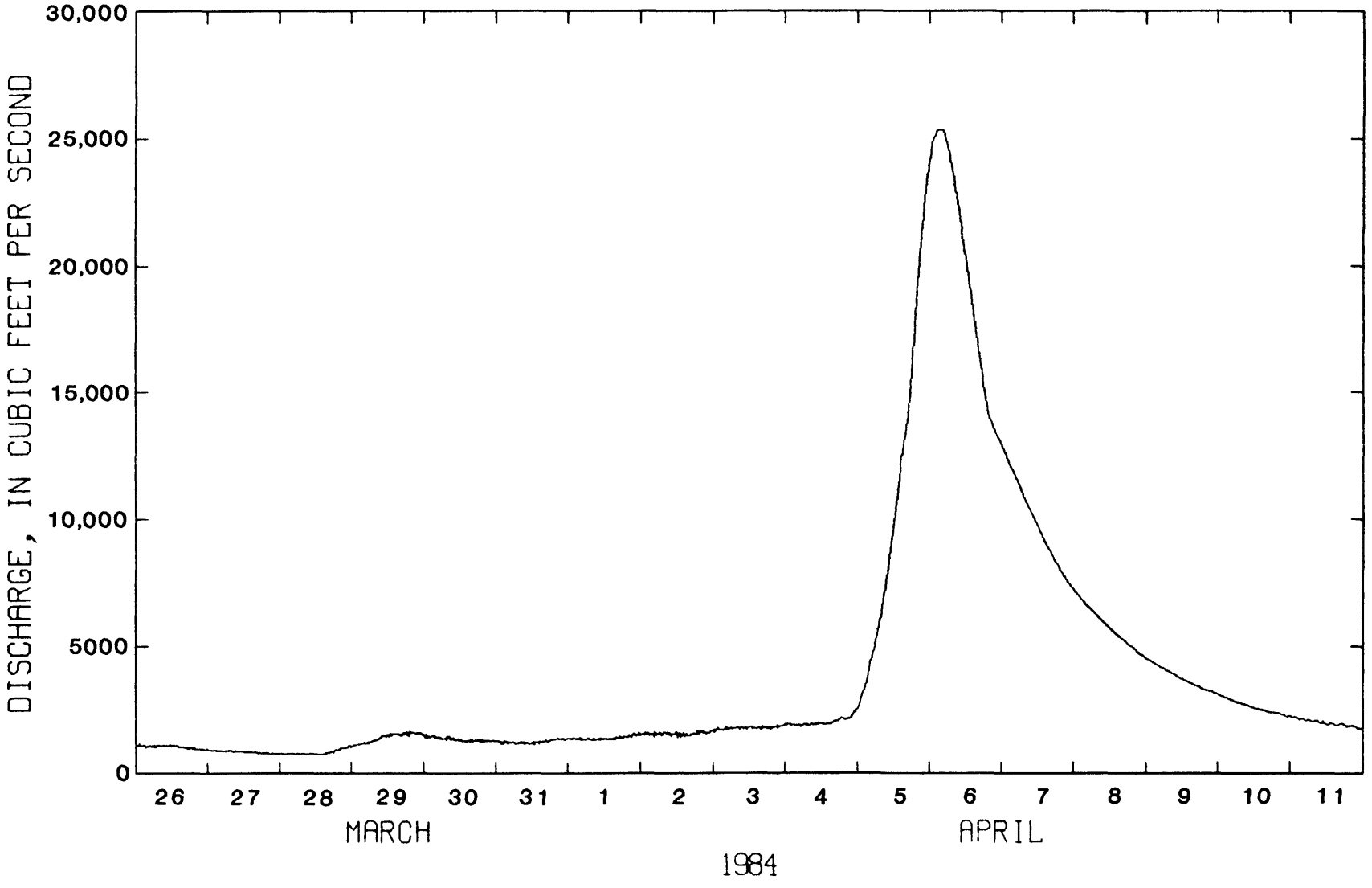
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	1110	10.00
3-26	0130	1170	10.07
3-26	0600	1120	10.01
3-26	1800	1040	9.95
3-26	2100	935	9.87
3-27	0015	947	9.88
3-27	1700	827	9.78
3-27	1800	827	9.78
3-27	2115	761	9.72
3-27	2400	805	9.76
3-28	0645	761	9.72
3-28	1500	816	9.77
3-28	1800	910	9.85
3-28	2315	1110	10.00
3-29	0030	1100	9.99
3-29	0900	1370	10.27
3-29	1800	1650	10.52
3-29	1945	1660	10.53
3-30	0100	1550	10.43
3-30	0745	1320	10.22
3-30	1800	1340	10.24
3-30	1900	1250	10.15
3-31	0900	1220	10.12
3-31	1300	1130	10.02
3-31	1800	1270	10.17
3-31	2245	1400	10.30
4-01	0830	1310	10.21
4-01	1800	1420	10.32
4-01	2345	1630	10.50
4-02	0900	1590	10.47
4-02	1230	1390	10.29
4-02	1800	1570	10.45
4-02	2045	1730	10.58
4-03	0045	1640	10.51
4-03	1645	1890	10.80
4-03	1800	1840	10.71
4-03	2400	1940	10.88
4-04	0530	1850	10.73
4-04	1800	2150	11.18
4-04	2400	2540	11.70
4-05	0015	2570	11.75
4-05	0030	2630	11.83
4-05	0200	3190	12.55
4-05	0345	3900	13.40
4-05	0530	4850	14.43
4-05	0600	5050	14.64
4-05	0745	6120	15.72
4-05	0930	7340	16.88
4-05	1100	8830	18.19
4-05	1300	10600	19.60
4-05	1515	12800	21.21
4-05	1800	15300	22.35
4-05	1945	18600	23.14
4-05	2215	22400	23.92
4-05	2400	24100	24.25
4-06	0230	25400	24.47
4-06	0400	25400	24.47
4-06	0800	23600	24.16
4-06	1200	20500	23.55
4-06	1515	17600	22.92
4-06	1800	15400	22.38
4-06	2100	13800	21.84
4-06	2400	12900	21.27
4-07	0015	12900	21.23
4-07	0230	12300	20.81
4-07	0600	11400	20.14
4-07	1500	9020	18.34
4-07	1800	8360	17.79
4-07	2400	7310	16.85
4-08	0015	7240	16.79
4-08	0415	6690	16.27
4-08	0600	6440	16.03
4-08	1745	5140	14.74
4-08	1800	5100	14.69
4-08	2400	4540	14.11
4-09	0015	4520	14.08
4-09	0630	4070	13.59
4-09	1800	3420	12.83
4-09	2345	3130	12.47
4-10	0015	3100	12.44
4-10	0915	2710	11.95

(33) 01388500 POMPTON RIVER AT POMPTON PLAINS, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-10	1800	2410	11.52	4-11	1200	1930	10.86
4-10	2245	2240	11.30	4-11	1800	1890	10.80
				4-11	2245	1760	10.61
4-11	0015	2260	11.32				

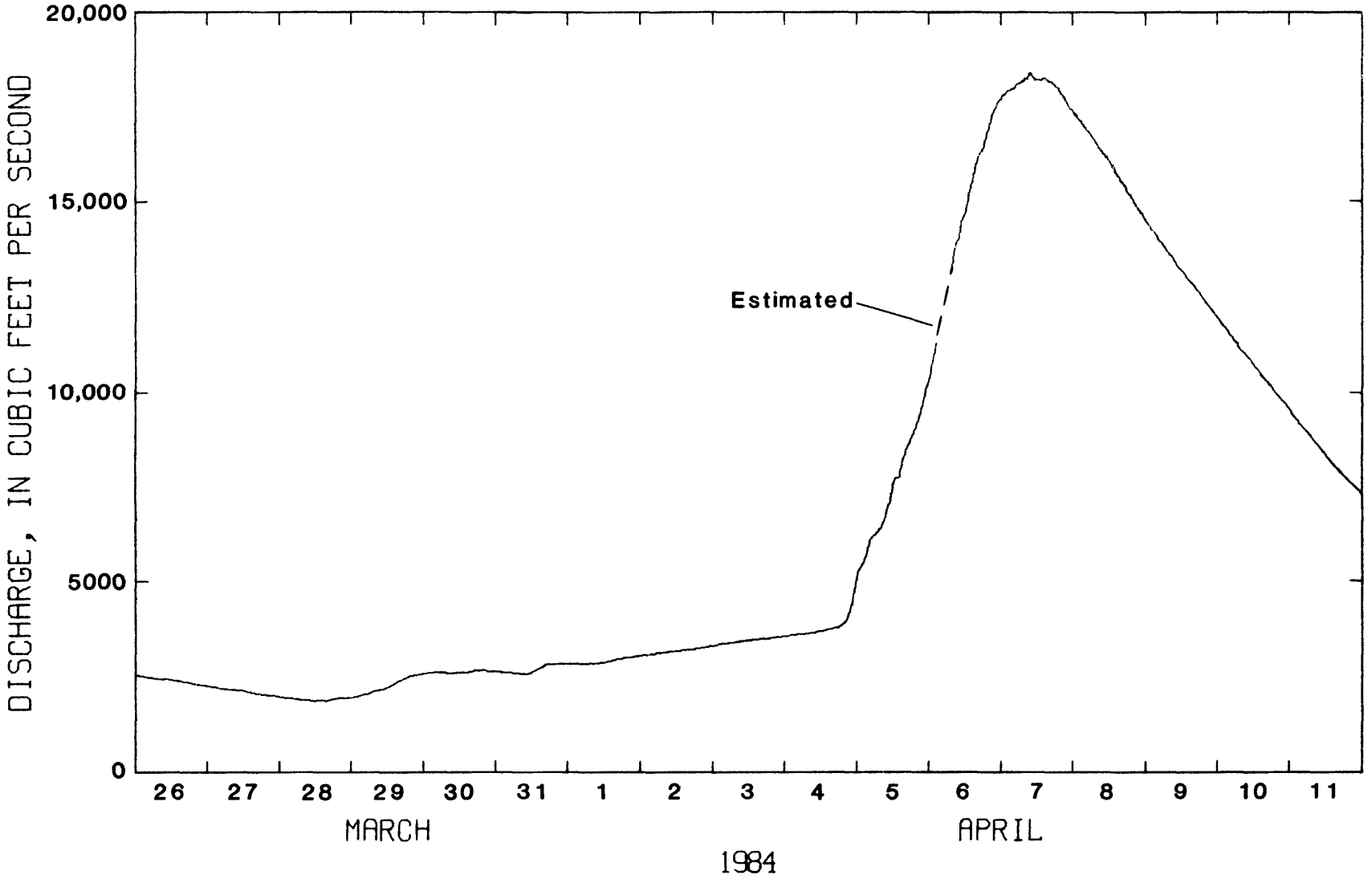


(Map No. 33) 01388500 Pompton River at Pompton Plains, NJ--continued

(35) 01389500 PASSAIC RIVER AT LITTLE FALLS, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	2560	4.42
3-26	0600	2470	4.34
3-26	1800	2350	4.22
3-26	2345	2270	4.14
3-27	0015	2270	4.14
3-27	1800	2050	3.91
3-27	2400	1990	3.84
3-28	0015	1990	3.84
3-28	1015	1890	3.73
3-28	1800	1940	3.78
3-29	0015	1970	3.82
3-29	1415	2330	4.20
3-29	1800	2470	4.34
3-29	2345	2590	4.45
3-30	0015	2590	4.45
3-30	1800	2660	4.52
3-30	1930	2680	4.54
3-31	0815	2600	4.46
3-31	1800	2830	4.68
3-31	2345	2860	4.70
4-01	0030	2840	4.69
4-01	1200	2870	4.71
4-01	1800	2980	4.81
4-01	2315	3040	4.87
4-02	0015	3060	4.88
4-02	1800	3230	5.03
4-02	2400	3310	5.10
4-03	0015	3320	5.11
4-03	1800	3510	5.27
4-03	2315	3560	5.31
4-04	0015	3560	5.31
4-04	1800	3810	5.51
4-04	2100	4030	5.67
4-04	2300	4600	6.08
4-04	2400	5080	6.40
4-05	0015	5190	6.47
4-05	0215	5530	6.69
4-05	0600	6220	7.11
4-05	1200	7540	7.86
4-05	1800	8740	8.50
4-05	2400	10400	9.30
4-06	0015	10500	9.34
4-06	0030	10500	9.38
4-06	1030	14300	11.18
4-06	1800	16400	12.07
4-06	2345	17700	12.63
4-07	0930	18400	12.91
4-07	1800	18100	12.79
4-07	2400	17400	12.51
4-08	0015	17400	12.49
4-08	1800	15300	11.60
4-08	2345	14500	11.28
4-09	0015	14500	11.27
4-09	1800	12600	10.38
4-09	2400	12000	10.08
4-10	0015	12000	10.07
4-10	1800	10200	9.20
4-10	2345	9560	8.91
4-11	0015	9540	8.90
4-11	1445	8090	8.16
4-11	1800	7830	8.02
4-11	2400	7320	7.74



(Map No. 35) 01389500 Passaic River at Little Falls, NJ

(40) 01390500 SADDLE RIVER AT RIDGEWOOD, NJ

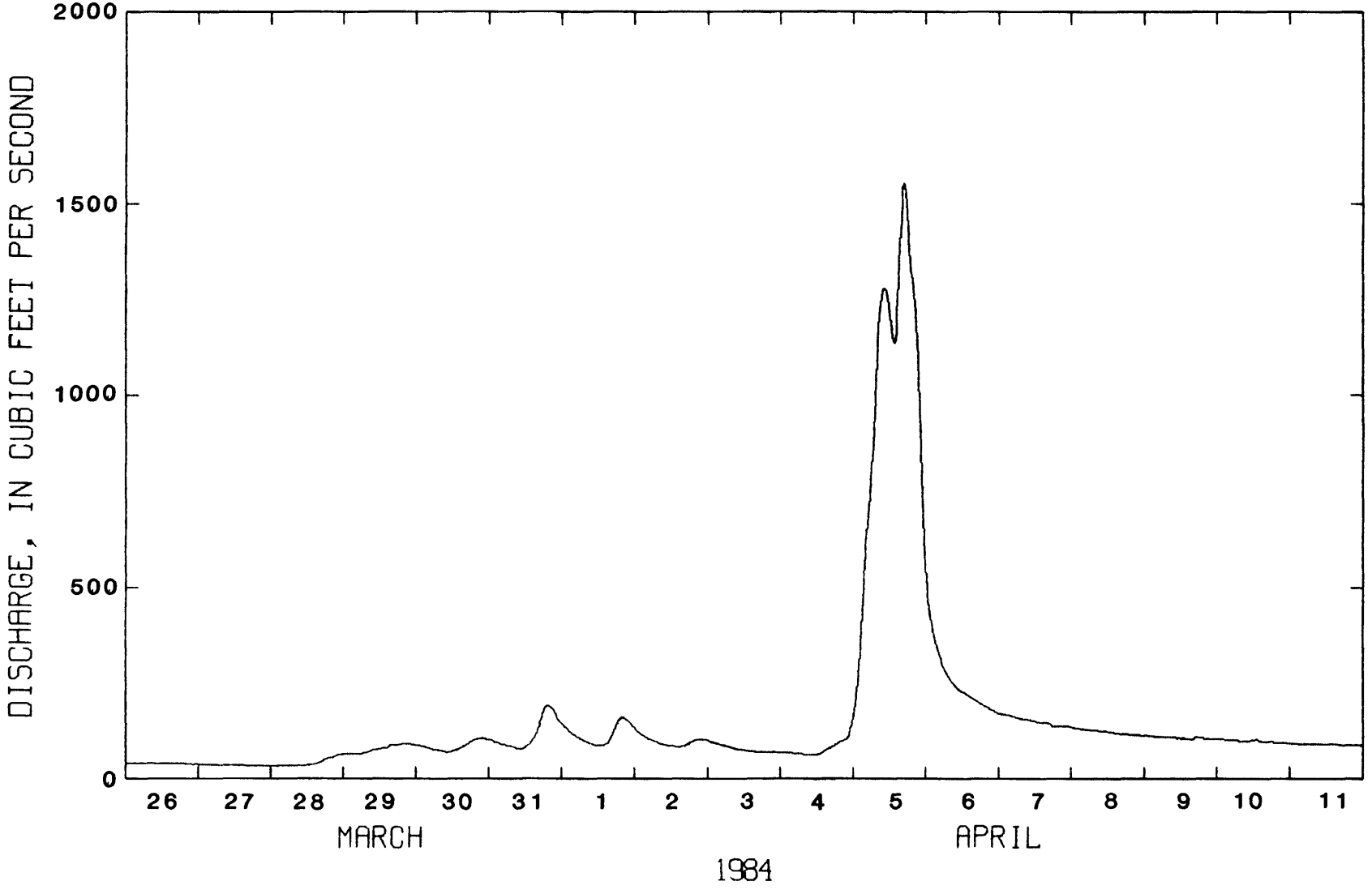
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	41	2.15
3-26	0600	41	2.15
3-26	1800	39	2.14
3-26	2200	37	2.12
3-27	0015	37	2.12
3-27	1000	35	2.09
3-27	1800	35	2.09
3-28	0015	35	2.09
3-28	1100	35	2.10
3-28	1530	43	2.16
3-28	1745	52	2.23
3-28	1800	52	2.23
3-28	2215	64	2.31
3-29	0015	64	2.31
3-29	0300	64	2.31
3-29	1045	78	2.40
3-29	1800	89	2.47
3-29	1815	90	2.48
3-29	2400	87	2.46
3-30	1000	71	2.36
3-30	1545	86	2.45
3-30	1800	97	2.52
3-30	2200	108	2.58
3-31	0915	81	2.42
3-31	1100	81	2.42
3-31	1530	117	2.64
3-31	1645	145	2.80
3-31	1800	177	2.97
3-31	1900	191	3.04
3-31	2100	181	2.99
4-01	0030	141	2.78
4-01	0430	113	2.61
4-01	0600	105	2.57
4-01	1115	87	2.46
4-01	1400	87	2.46
4-01	1715	127	2.70
4-01	1800	143	2.79
4-01	1930	161	2.89
4-02	0015	132	2.73
4-02	0300	114	2.62
4-02	0600	100	2.54
4-02	1345	82	2.43
4-02	1800	92	2.49
4-02	2200	102	2.55
4-03	0015	100	2.54
4-03	0800	81	2.42
4-03	1545	71	2.36
4-03	1800	71	2.36
4-03	2245	69	2.35
4-04	0730	65	2.32
4-04	1715	86	2.45
4-04	1800	89	2.47
4-04	2215	108	2.58
4-04	2300	130	2.72
4-04	2400	157	2.87
4-05	0015	167	2.92
4-05	0045	196	3.07
4-05	0130	251	3.33
4-05	0215	326	3.65
4-05	0245	392	3.90
4-05	0315	471	4.17
4-05	0415	587	4.53
4-05	0530	714	4.88
4-05	0600	784	5.06
4-05	0715	954	5.47
4-05	0830	1180	5.96
4-05	1000	1280	6.19
4-05	1400	1150	5.89
4-05	1545	1430	6.53
4-05	1645	1560	6.80
4-05	1800	1470	6.62
4-05	2115	1140	5.88
4-05	2230	856	5.24
4-05	2315	680	4.79
4-06	0015	527	4.35
4-06	0200	412	3.97
4-06	0430	324	3.64
4-06	0600	292	3.51
4-06	1115	233	3.25
4-06	1800	196	3.07
4-06	2400	171	2.94
4-07	0015	171	2.94
4-07	0815	156	2.86
4-07	1800	138	2.76

(40) 01390500 SADDLE RIVER AT RIDGEWOOD, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-07	2330	134	2.74	4-09	2345	102	2.55
4-08	0015	132	2.73	4-10	0800	99	2.53
4-08	1800	117	2.64	4-10	1300	105	2.57
4-08	2300	113	2.61	4-10	1800	96	2.51
				4-10	2300	92	2.49
4-09	0015	113	2.61				
4-09	1600	103	2.56	4-11	0015	92	2.49
4-09	1800	109	2.59	4-11	1800	87	2.46
				4-11	2215	86	2.45



(Map No. 40) 01390500 Saddle River at Ridgewood, NJ--continued

(43) 01391000 HOHOKUS BROOK AT HO-HO-KUS, NJ

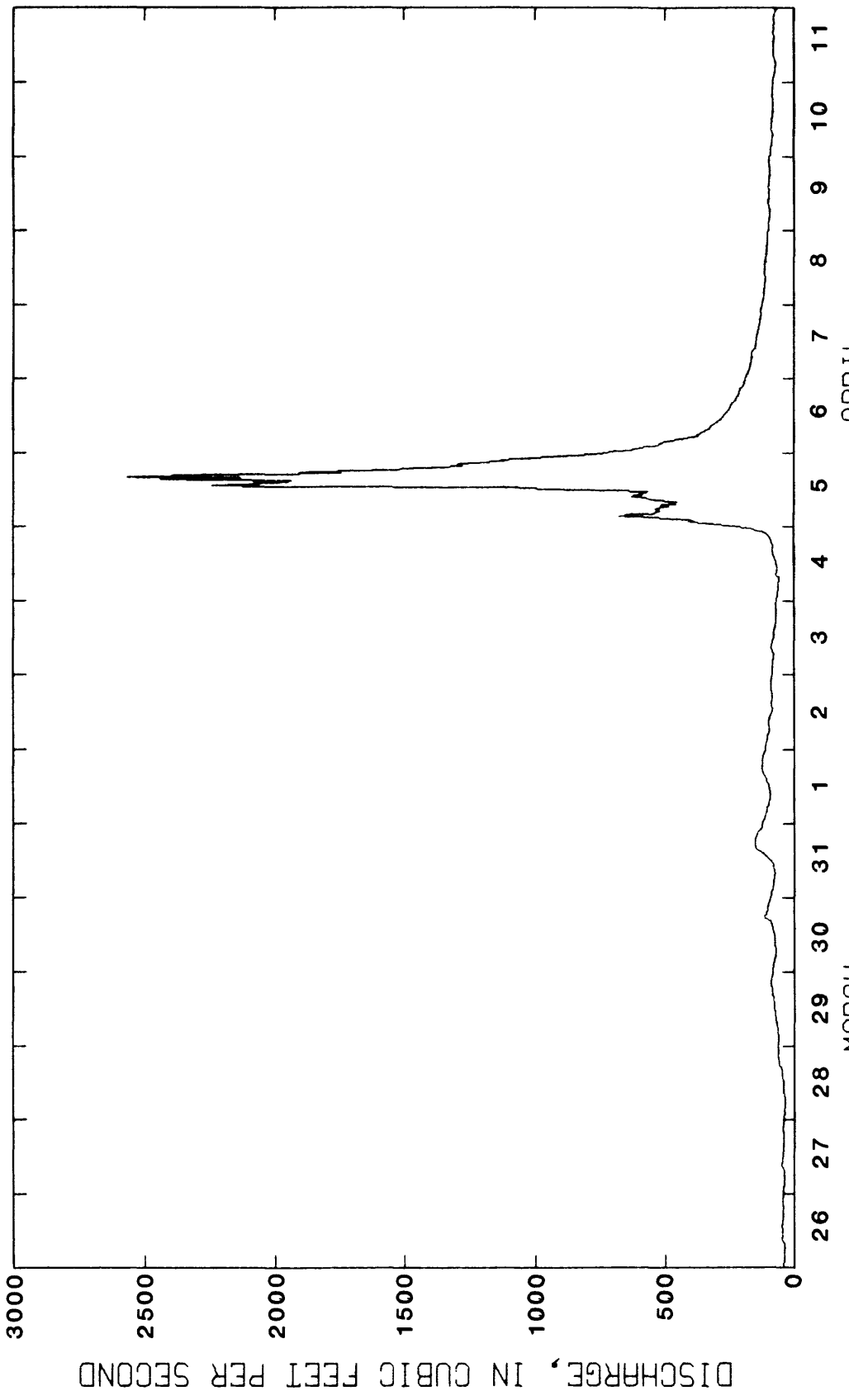
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	43	1.60
3-26	0600	38	1.57
3-26	0830	46	1.62
3-26	0845	48	1.63
3-26	1800	45	1.61
3-26	2100	46	1.62
3-27	0700	38	1.57
3-27	0900	48	1.63
3-27	1800	43	1.60
3-27	2100	46	1.62
3-28	0500	37	1.56
3-28	0800	40	1.58
3-28	1630	53	1.66
3-28	1800	60	1.70
3-28	2045	66	1.73
3-29	0030	62	1.71
3-29	0900	74	1.77
3-29	1400	79	1.79
3-29	1800	88	1.83
3-29	1915	90	1.84
3-30	0600	72	1.76
3-30	1700	107	1.91
3-30	1730	115	1.94
3-30	1800	115	1.94
3-31	0130	90	1.84
3-31	0600	81	1.80
3-31	0730	77	1.78
3-31	1245	97	1.87
3-31	1415	118	1.95
3-31	1545	144	2.04
3-31	1645	150	2.06
3-31	1800	150	2.06
4-01	0130	118	1.95
4-01	0600	100	1.88
4-01	0815	95	1.86
4-01	1200	97	1.87
4-01	1615	121	1.96
4-01	1745	126	1.98
4-01	1800	126	1.98
4-02	0015	115	1.94
4-02	0200	113	1.93
4-02	0530	100	1.88
4-02	0600	97	1.87
4-02	1315	83	1.81
4-02	1800	88	1.83
4-03	0700	79	1.79
4-03	0830	88	1.83
4-03	1800	74	1.77
4-03	2345	70	1.75
4-04	0615	62	1.71
4-04	1800	85	1.82
4-04	2130	105	1.90
4-04	2230	126	1.98
4-04	2315	159	2.09
4-04	2345	197	2.20
4-04	2400	215	2.25
4-05	0015	242	2.32
4-05	0045	297	2.45
4-05	0130	389	2.64
4-05	0245	500	2.84
4-05	0315	626	3.04
4-05	0600	543	2.91
4-05	0800	465	2.78
4-05	1000	632	3.05
4-05	1145	706	3.16
4-05	1215	944	3.48
4-05	1300	2010	4.67
4-05	1530	2440	5.11
4-05	1600	2570	5.26
4-05	1730	1740	4.39
4-05	1800	1830	4.48
4-05	1915	1420	4.03
4-05	2130	1120	3.70
4-05	2315	850	3.36
4-06	0015	712	3.17
4-06	0045	678	3.12
4-06	0230	530	2.89
4-06	0445	421	2.70
4-06	0600	379	2.62
4-06	1000	297	2.45
4-06	1645	230	2.29
4-06	1800	222	2.27
4-06	2315	193	2.19
4-07	0015	193	2.19

(43) 01391000 HOHOKUS BROOK AT HO-HO-KUS, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-07	0300	176	2.14	4-09	0415	95	1.86
4-07	0600	169	2.12	4-09	1100	100	1.88
4-07	1700	135	2.01	4-09	1800	95	1.86
4-07	1800	135	2.01				
4-07	2330	126	1.98	4-10	0015	92	1.86
				4-10	1800	85	1.83
4-08	0015	126	1.98	4-10	2330	81	1.81
4-08	0600	113	1.93				
4-08	1800	110	1.92	4-11	0500	77	1.79
4-08	2345	102	1.89	4-11	0830	83	1.82
				4-11	1800	79	1.80
4-09	0015	102	1.89	4-11	2330	70	1.77



(Map No. 43) 01391000 Hohokus Brook at Ho-Ho-Kus, NJ--continued

(44) 01391500 SADDLE RIVER AT LODI, NJ

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	--	a133	--
3-27	--	a126	--
3-28	--	a144	--
3-29	--	a229	--
3-30	--	a255	--
3-31	--	a329	--
4-01	--	a332	--
4-02	--	a283	--
4-03	--	a236	--
4-04	--	a241	--
4-05	--	a2970	--
	--	3350	b9.51
4-06	--	a847	--
4-07	--	a439	--
4-08	--	a342	--
4-09	1300	287	2.97
4-09	1800	276	2.95
4-09	2330	272	2.94
4-10	0015	272	2.94
4-10	1800	252	2.88
4-10	2330	245	2.86
4-11	0015	248	2.87
4-11	1800	235	2.83
4-11	2030	232	2.81

a Estimated mean daily discharge
b High-water mark

(45) 01392210 THIRD RIVER AT PASSAIC, NJ

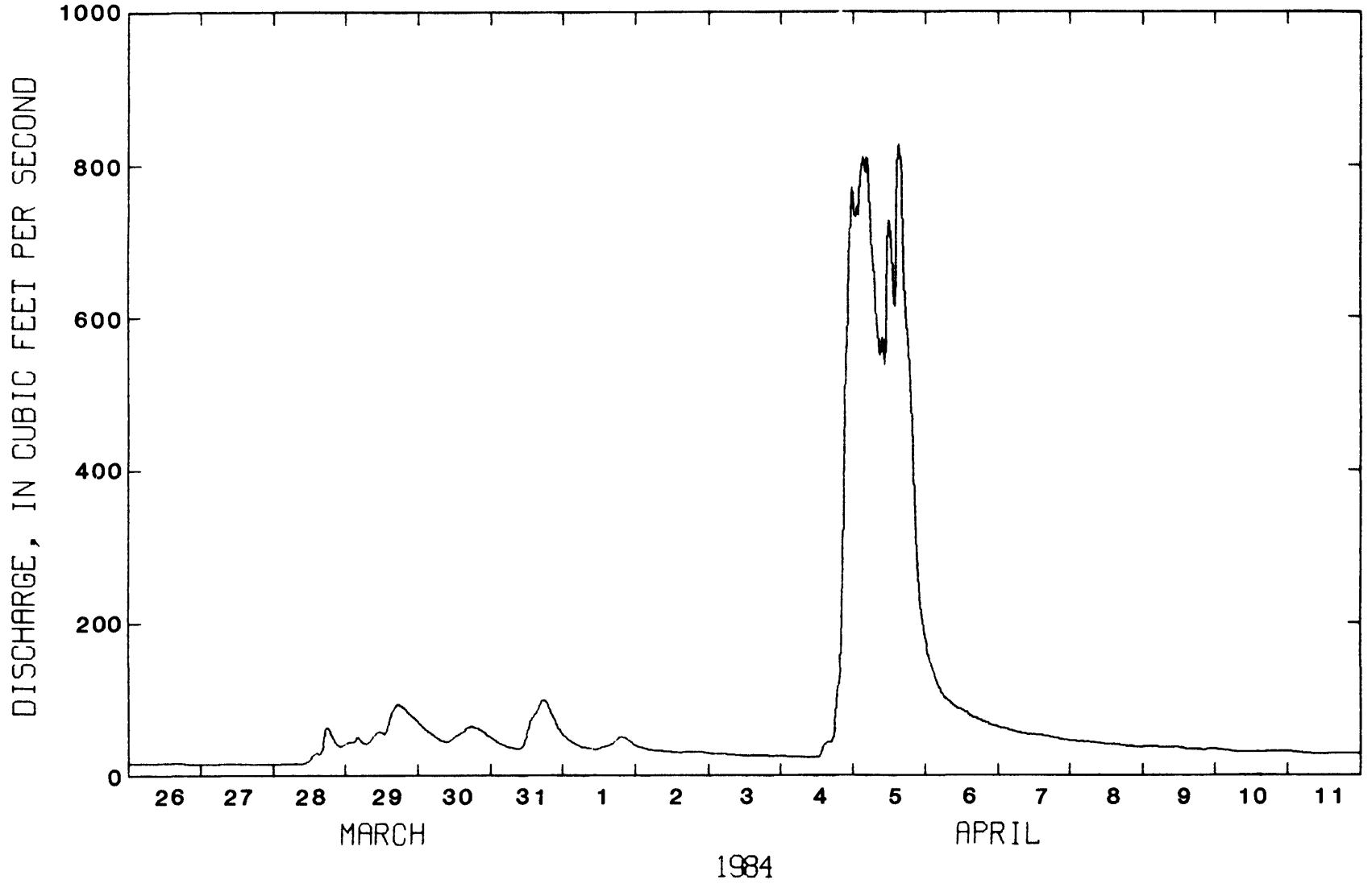
GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT	DATE	TIME	DIS-CHARGE	GAGE HEIGHT
3-26	0015	17	2.16	3-31	1700	98	2.93
3-26	0600	17	2.16	3-31	1800	98	2.93
3-26	1515	16	2.14	3-31	2030	78	2.82
3-26	1800	16	2.15	3-31	2245	62	2.71
3-27	0015	16	2.14	4-01	0015	54	2.64
3-27	0800	15	2.13	4-01	0130	49	2.60
3-27	1800	15	2.13	4-01	0545	39	2.50
				4-01	0600	39	2.50
3-28	0015	15	2.13	4-01	1000	34	2.45
3-28	0900	15	2.13	4-01	1745	47	2.58
3-28	1130	18	2.20	4-01	1800	48	2.59
3-28	1230	23	2.29	4-01	1900	50	2.61
3-28	1330	28	2.37				
3-28	1615	35	2.46	4-02	0015	40	2.51
3-28	1645	49	2.60	4-02	0115	38	2.49
3-28	1715	60	2.69	4-02	0600	33	2.44
3-28	1745	64	2.72	4-02	1200	30	2.40
3-28	1800	64	2.72	4-02	1800	32	2.42
3-28	1945	50	2.61				
3-28	2145	40	2.51	4-03	0015	29	2.39
				4-03	1800	26	2.34
3-29	0330	49	2.60	4-03	2015	25	2.33
3-29	0600	43	2.54				
3-29	0645	42	2.53	4-04	0545	24	2.31
3-29	0915	51	2.62	4-04	1200	24	2.31
3-29	1345	62	2.71	4-04	1345	33	2.44
3-29	1445	77	2.81	4-04	1430	41	2.52
3-29	1630	93	2.90	4-04	1730	49	2.60
3-29	1700	94	2.91	4-04	1800	61	2.70
3-29	1800	93	2.90	4-04	1830	82	2.84
3-29	2315	74	2.79	4-04	1900	109	2.98
				4-04	2000	143	3.12
3-30	0015	69	2.76	4-04	2015	173	3.22
3-30	0300	58	2.68	4-04	2030	212	3.34
3-3 0	1600	50	2.61	4-04	2045	279	3.52
3-30	0900	45	2.56	4-04	2100	364	3.75
3-30	1545	61	2.70	4-04	2130	480	4.04
3-30	1800	64	2.72	4-04	2230	617	4.38
3-30	2400	50	2.61	4-04	2330	760	4.73
				4-04	2345	772	4.76
3-31	0445	40	2.51				
3-31	0600	38	2.49	4-05	0300	808	4.85
3-31	0815	35	2.46	4-05	0800	596	4.33
3-31	1130	47	2.58	4-05	0900	555	4.23
3-31	1230	58	2.68	4-05	1145	725	4.64
3-31	1315	71	2.77	4-05	1400	617	4.38
3-31	1530	85	2.86	4-05	1515	829	4.90

(45) 01392210 THIRD RIVER AT PASSAIC, NJ -- CONTINUED

GAGE HEIGHT, IN FEET, AND DISCHARGE IN CUBIC FEET PER SECOND, FOR SELECTED DATES AND TIMES, 1984

DATE	TIME	DIS-CHARGE	GAGE HEIGHT
4-05	1800	592	4.32
4-05	1945	460	3.99
4-05	2030	368	3.76
4-05	2115	293	3.56
4-05	2215	233	3.40
4-05	2345	186	3.26
4-05	2400	183	3.25
4-06	0015	176	3.23
4-06	0200	146	3.13
4-06	0430	115	3.01
4-06	0600	107	2.97
4-06	1215	85	2.86
4-06	1800	74	2.79
4-06	2400	64	2.72
4-07	0015	64	2.72
4-07	0445	58	2.68
4-07	0600	57	2.67
4-07	1800	50	2.61
4-07	2345	46	2.57
4-08	0015	46	2.57
4-08	1645	40	2.51
4-08	1800	40	2.51
4-08	2115	38	2.49
4-09	0015	38	2.49
4-09	1800	34	2.45
4-09	1930	33	2.44
4-10	0015	34	2.45
4-10	0915	31	2.41
4-10	1800	32	2.42
4-11	0015	31	2.41
4-11	0800	29	2.38
4-11	1800	29	2.38
4-11	2400	27	2.36



(Map No. 45) 01392210 Third River at Passaic, NJ

GLOSSARY

Contents.--The volume of water in a reservoir or lake. Content is computed on the basis of a level pool and does not include bank storage.

Cubic feet per second (ft^3/s).--The rate of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section 1 foot wide and 1 foot deep, flowing at an average velocity of 1 foot per second. It equals 28.32 liters per second or 0.02832 cubic meters per second. All discharges in this report are instantaneous rather than mean values.

Cubic feet per second per square mile ($(ft^3/s)/mi^2$).--The average number of cubic feet of water per second, flowing from each square mile of area drained by a stream, with the assumption that the runoff is distributed uniformly in time and area. It is equivalent to 0.01093 cubic meters per second per square kilometer.

Crest-stage station.--A particular site where only information on crest stage and peak discharge is registered systematically between inspections of the gage.

Discharge.--The volume of water that passes a given point within a given period of time.

Drainage area of a stream at a specific location.--The area, measured in a horizontal plane, which is enclosed by a topographic divide. Drainage area is given in square miles. One square mile is equivalent to 2.590 square kilometers.

Gage height (G.H.).--The water-surface elevation referred to some arbritrary gage datum. Gage height is often used interchangeably with the more general term "stage", although gage height is more appropriate when used with a reading on a gage.

Gaging station.--A particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained.

Isohyet.--A line drawn on a map connecting points receiving equal rainfall.

Stage.--See gage height.

Time of day.--Expressed in 24-hour time; for example, 12:30 a.m. is 0030 hours, 1:00 p.m. is 1300 hours. All time noted is eastern standard time.

Water year.--The period beginning October 1 and ending September 30 of the following calendar year, designated by the calendar year in which it ends. For example, the water year 1984 begins October 1, 1983 and ends September 30, 1984.

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