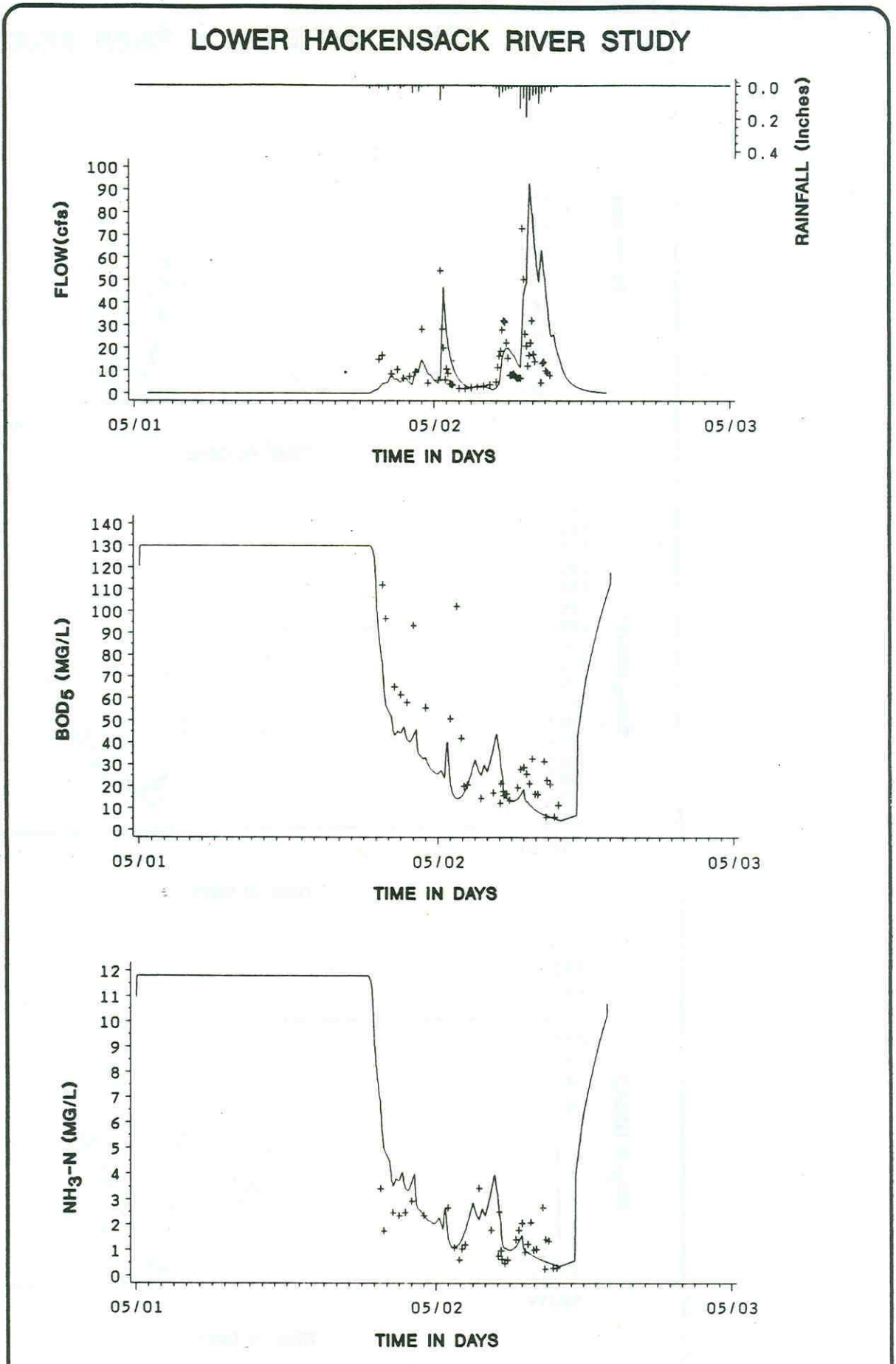

LOWER HACKENSACK RIVER STUDY
FLOW(cfs)
RAINFALL (Inches)
0.0
0.2
0.4
100
90
80
70
60
50
40
30
20
10
0
05/01
05/02
05/03
TIME IN DAYS
BOD5 (MG/L)
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
05/01
05/02
05/03
TIME IN DAYS
NH3-N (MG/L)
12
11
10
9
8
7
6
5
4
3
2
1
0
05/01
05/02
05/03
TIME IN DAYS
SWMM MODEL VERIFICATION
SIP AVE. CSO - MAY 1989

Figure 4.19

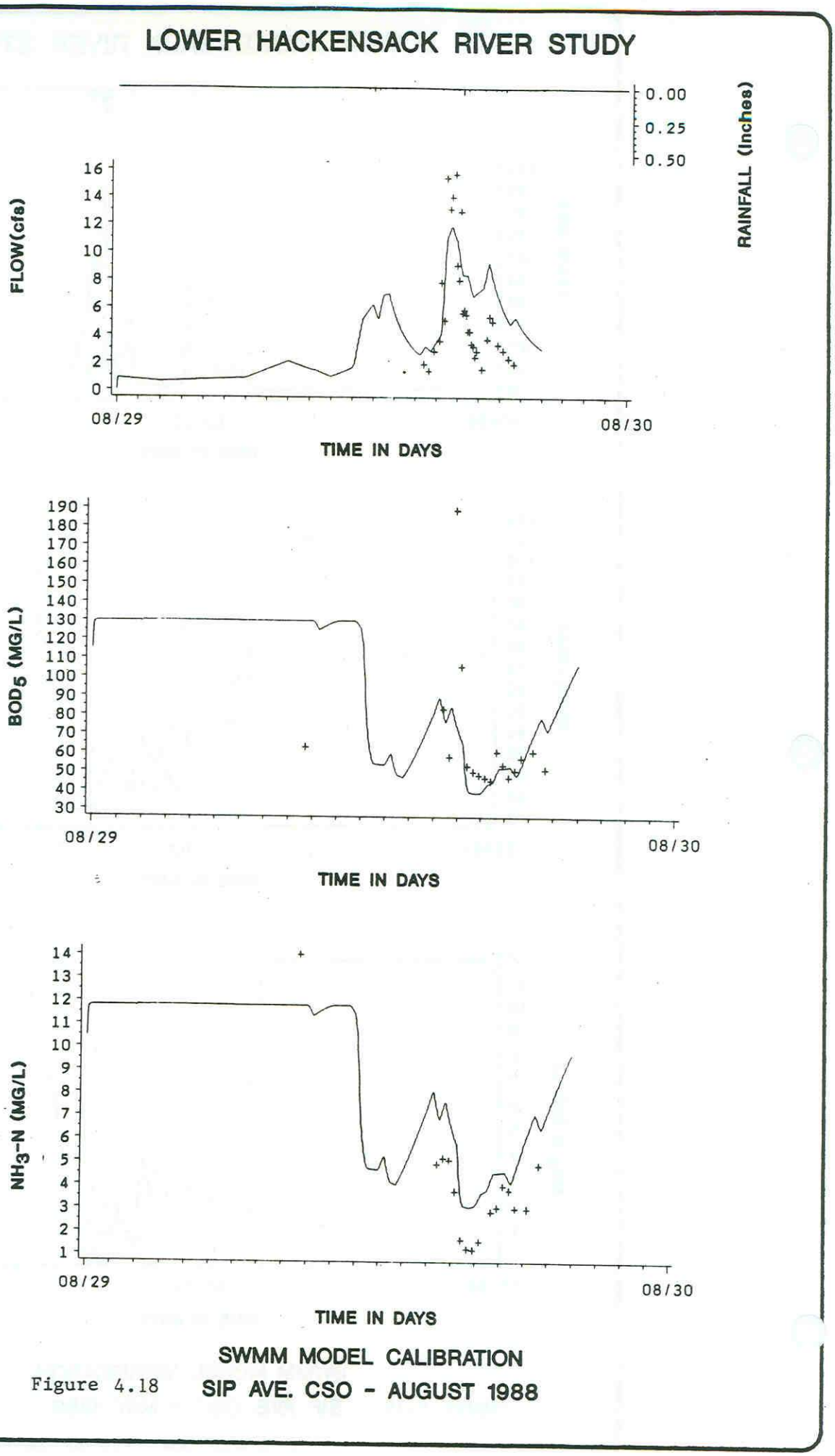

LOWER HACKENSACK RIVER STUDY
RAINFALL (Inches)
0.00
0.25
0.50
FLOW(cfs)
16
14
12
10
8
6
4
2
0
08/29
08/30
TIME IN DAYS
BOD5 (MG/L)
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
08/29
08/30
TIME IN DAYS
NH3-N (MG/L)
14
13
12
11
10
9
8
7
6
5
4
3
2
1
08/29
08/30
TIME IN DAYS
SWMM MODEL CALIBRATION
SIP AVE. CSO - AUGUST 1988

Figure 4.18

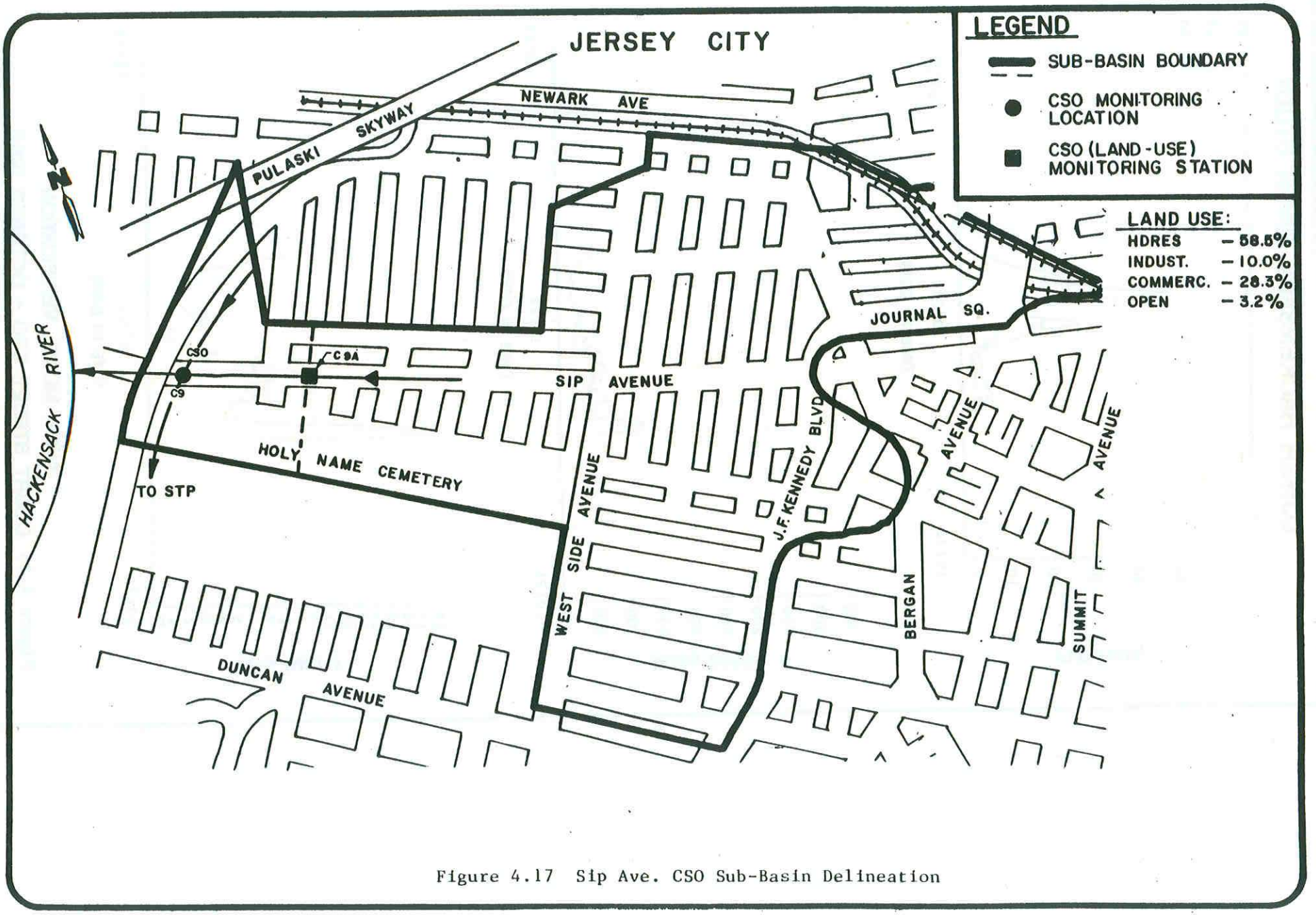


Figure 4.17 Sip Ave. CSO Sub-Basin Delineation

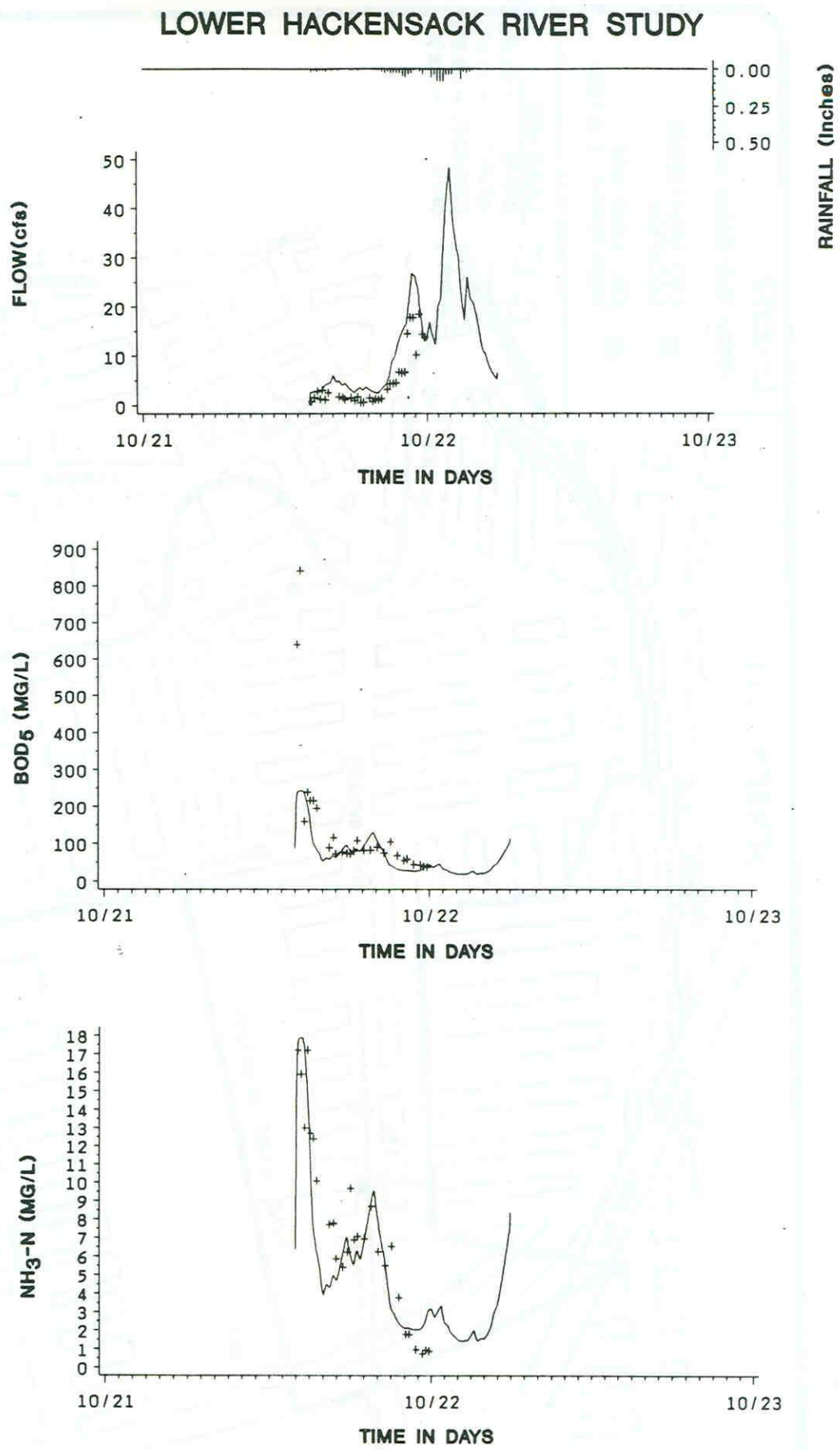

LOWER HACKENSACK RIVER STUDY
0.00
0.25
0.50
RAINFALL (Inches)
FLOW(cfs)
50
40
30
20
10
0
10/21
10/22
10/23
TIME IN DAYS
BOD5 (MG/L)
900
800
700
600
500
400
300
200
100
0
10/21
10/22
10/23
TIME IN DAYS
NH3-N (MG/L)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
10/21
10/22
10/23
TIME IN DAYS
SWMM MODEL VERIFICATION
COURT STREET CSO - OCTOBER 1988

Figure 4.16

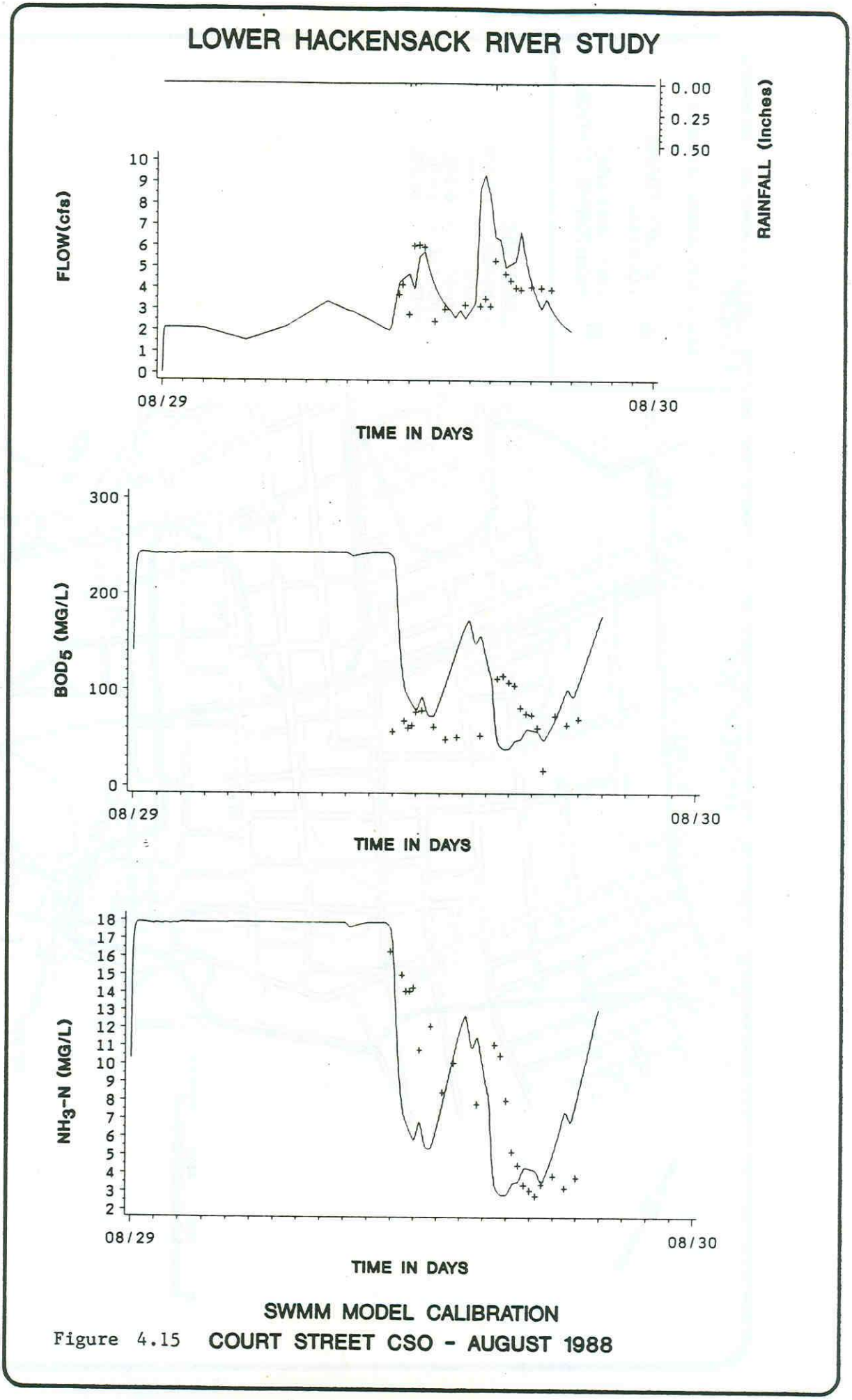

LOWER HACKENSACK RIVER STUDY
FLOW(cfs)
RAINFALL (Inches)
0.00
0.25
0.50
10
9
8
7
6
5
4
3
2
1
0
08/29
08/30
TIME IN DAYS
BOD5 (MG/L)
300
200
100
0
08/29
08/30
TIME IN DAYS
NH3-N (MG/L)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
08/29
08/30
TIME IN DAYS
SWMM MODEL CALIBRATION
COURT STREET CSO - AUGUST 1988

Figure 4.15

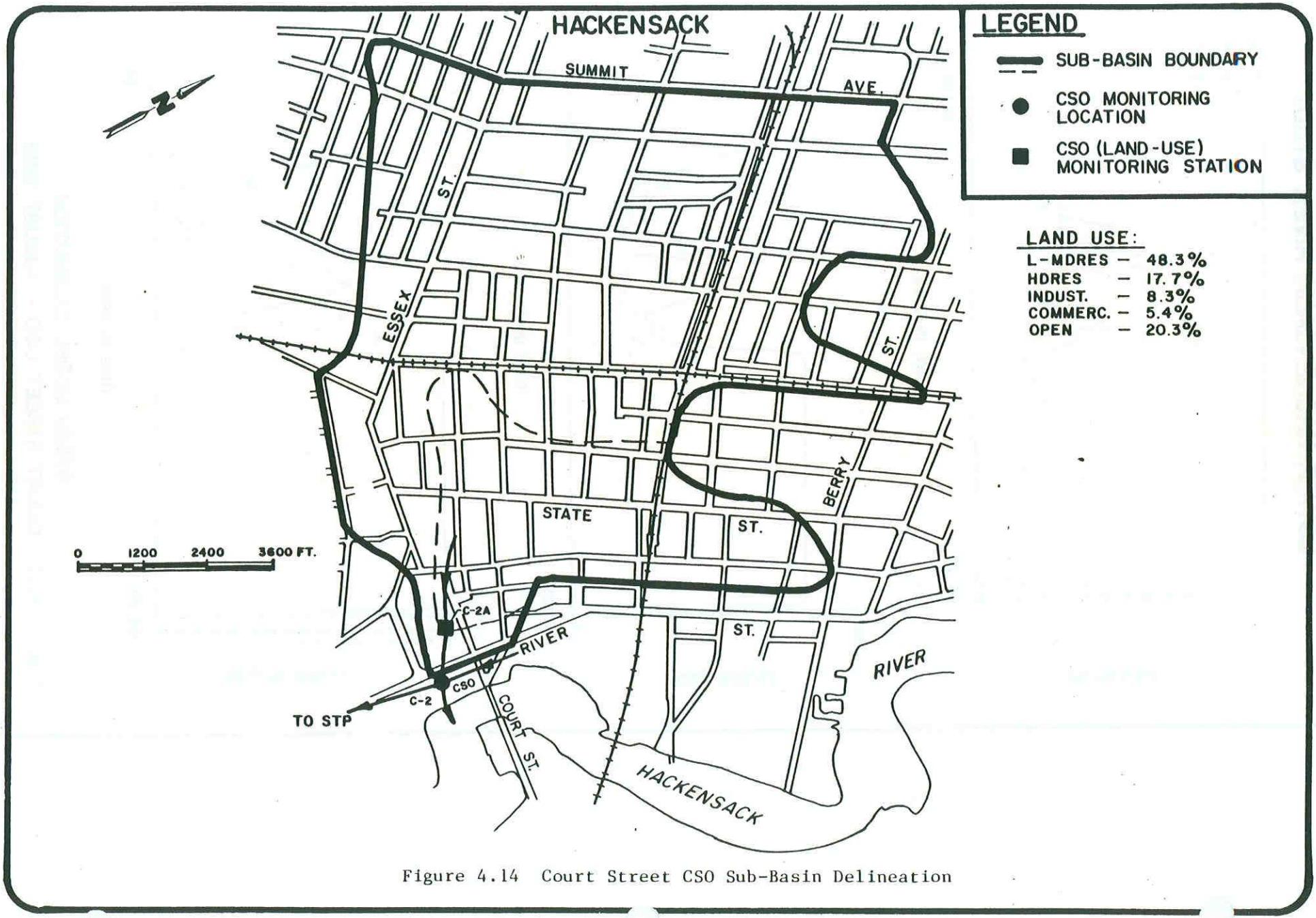


Figure 4.14 Court Street CSO Sub-Basin Delineation

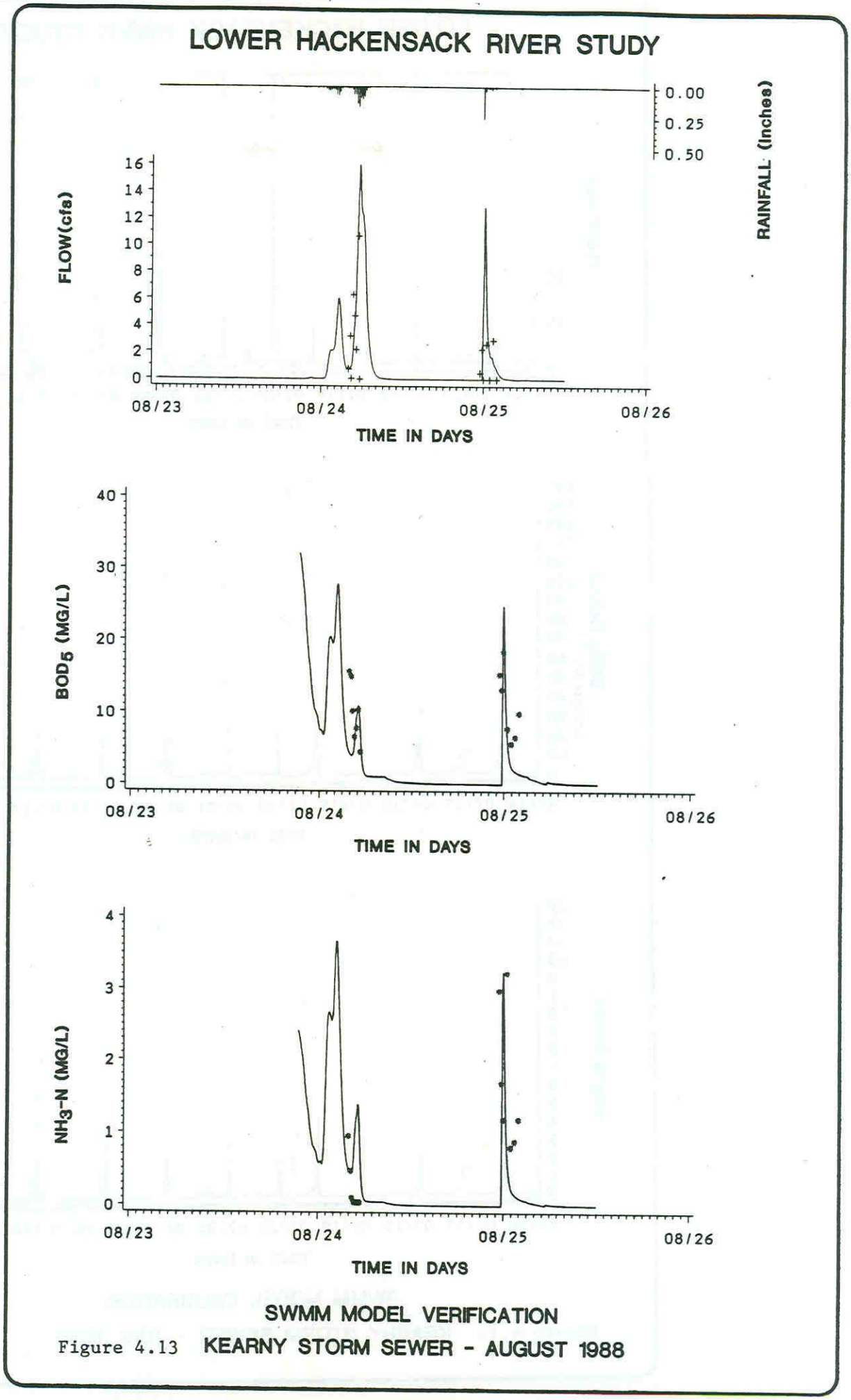

LOWER HACKENSACK RIVER STUDY
RAINFALL (Inches)
0.00
0.25
0.50
FLOW(cfs)
16
14
12
10
8
6
4
2
0
08/23
08/24
08/25
08/26
TIME IN DAYS
BOD5 (MG/L)
40
30
20
10
0
08/23
08/24
08/25
08/26
TIME IN DAYS
NH3-N (MG/L)
4
3
2
1
0
08/23
08/24
08/25
08/26
TIME IN DAYS
SWMM MODEL VERIFICATION
KEARNY STORM SEWER - AUGUST 1988

Figure 4.13

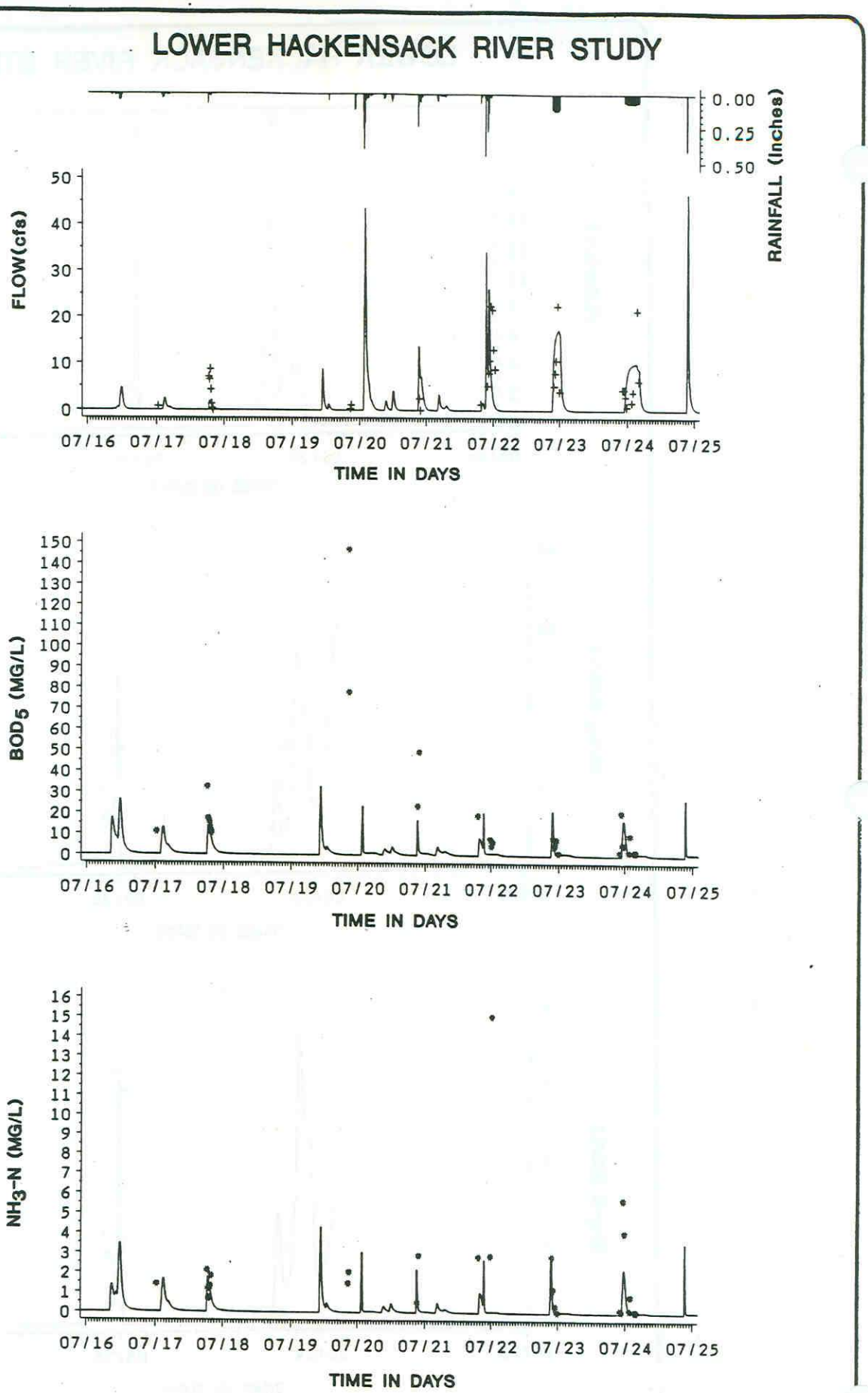


Figure 4.12 KEARNY STORM SEWER - JULY 1988

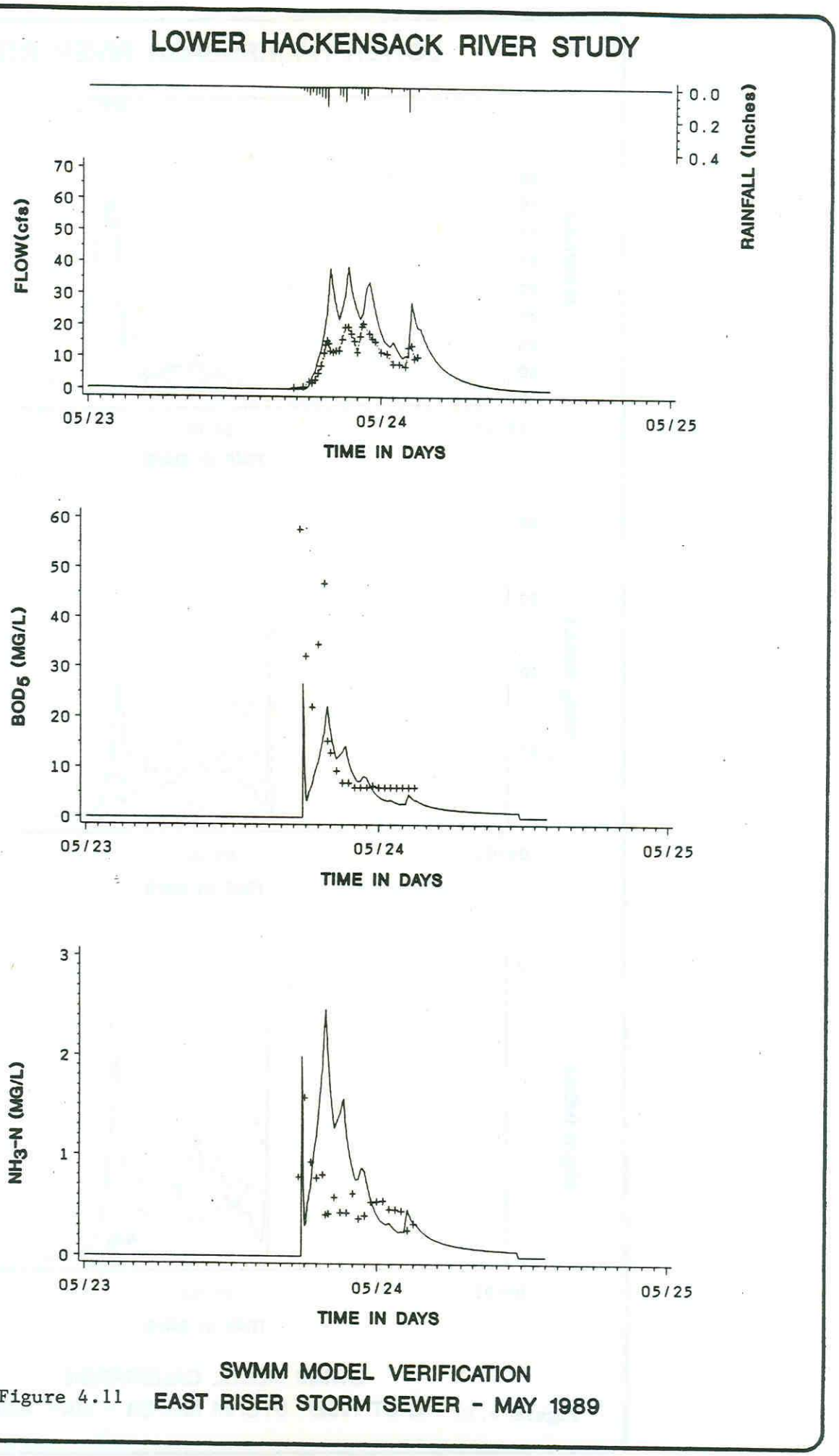

LOWER HACKENSACK RIVER STUDY
RAINFALL (Inches)
0.0
0.2
0.4
FLOW(cfs)
70
60
50
40
30
20
10
0
05/23
05/24
05/25
TIME IN DAYS
BOD5 (MG/L)
60
50
40
30
20
10
0
05/23
05/24
05/25
TIME IN DAYS
NH3-N (MG/L)
3
2
1
0
05/23
05/24
05/25
TIME IN DAYS
SWMM MODEL VERIFICATION
EAST RISER STORM SEWER - MAY 1989

Figure 4.11

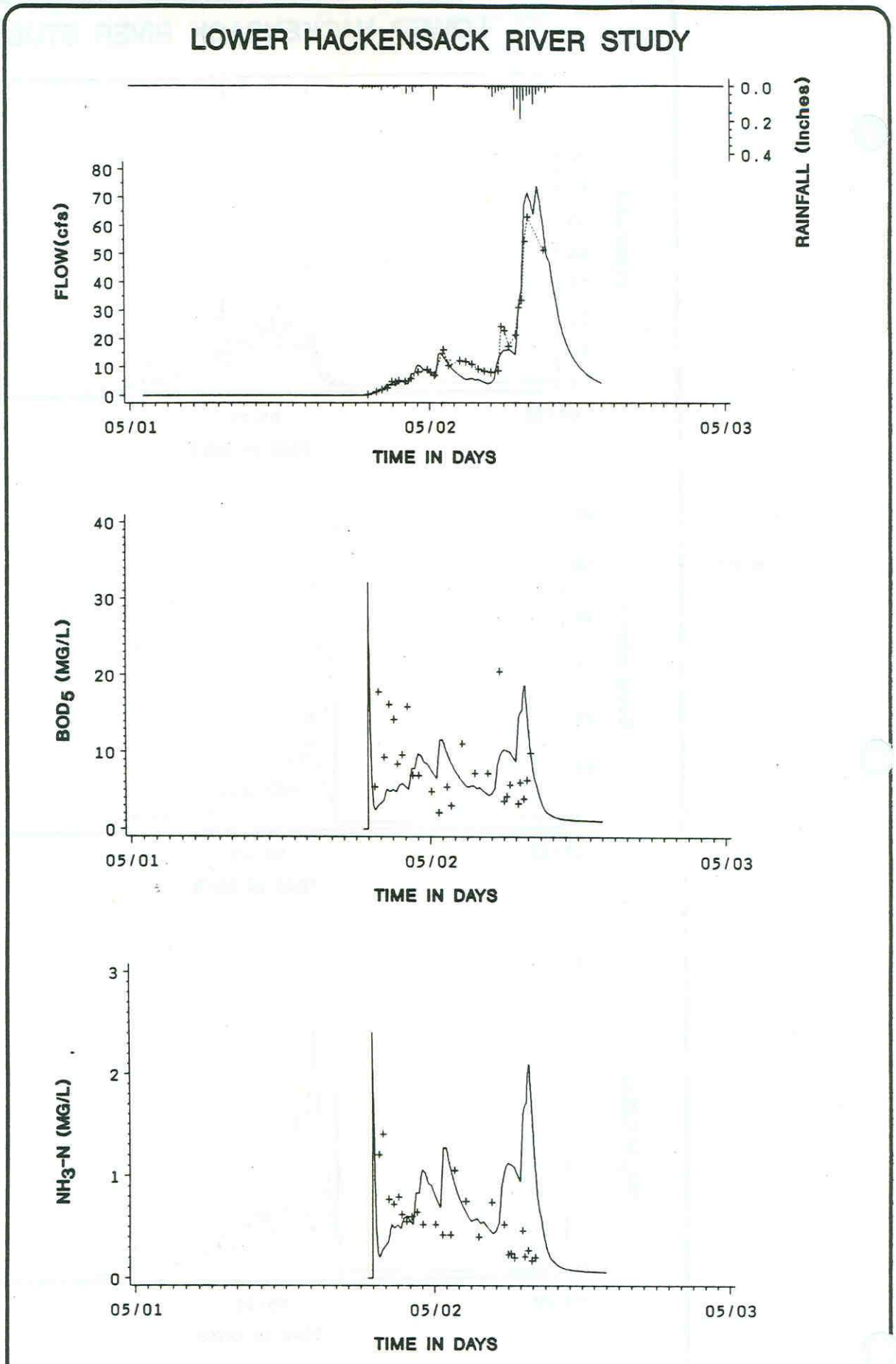

LOWER HACKENSACK RIVER STUDY
RAINFALL (Inches)
0.0
0.2
0.4
FLOW(cfs)
80
70
60
50
40
30
20
10
0
05/01
05/02
05/03
TIME IN DAYS
BOD5 (MG/L)
40
30
20
10
0
05/01
05/02
05/03
TIME IN DAYS
NH3-N (MG/L)
3
2
1
0
05/01
05/02
05/03
TIME IN DAYS
SWMM MODEL CALIBRATION
EAST RISER STORM SEWER - MAY 1989

Figure 4.10

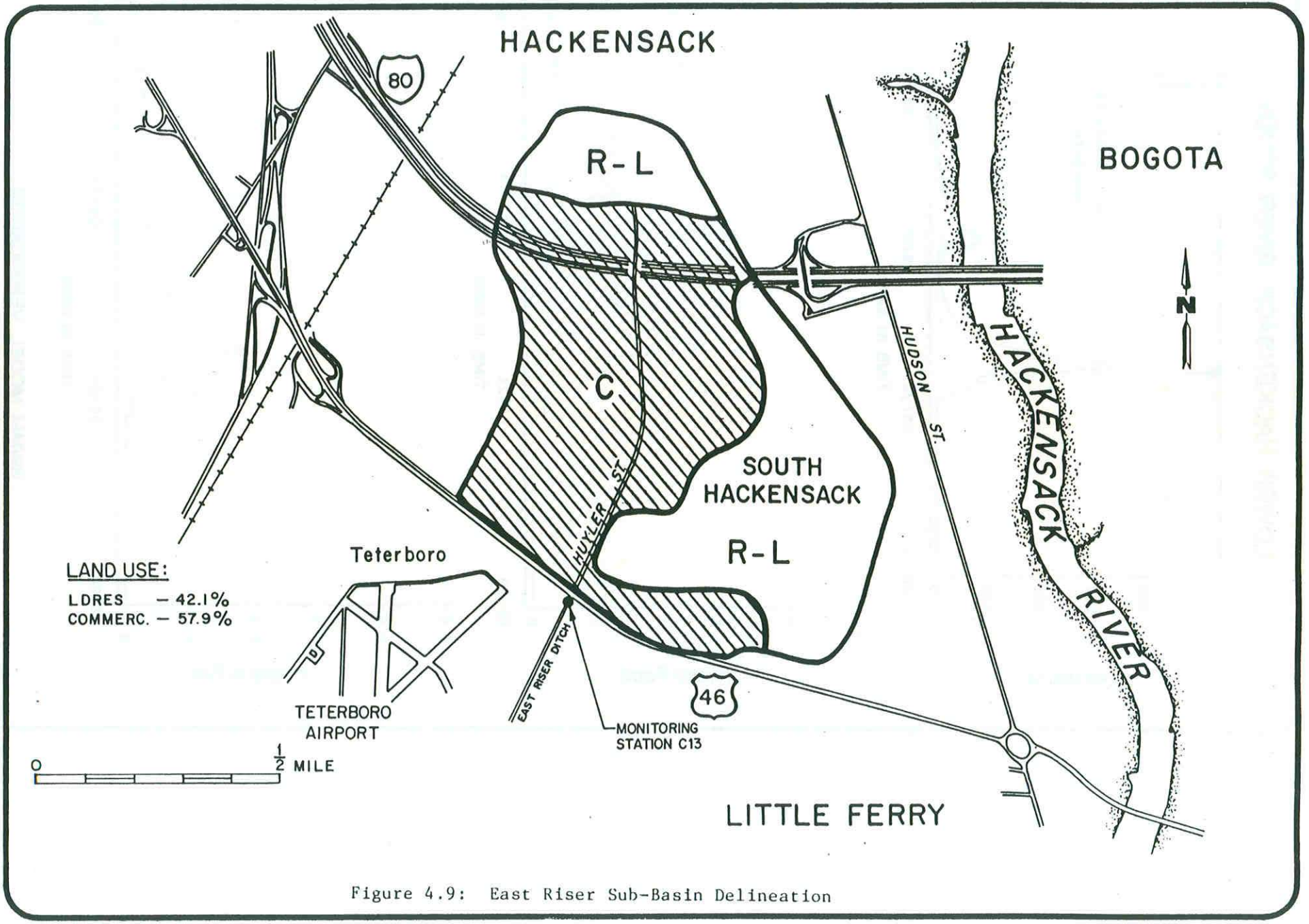


Figure 4.9: East Riser Sub-Basin Delineation

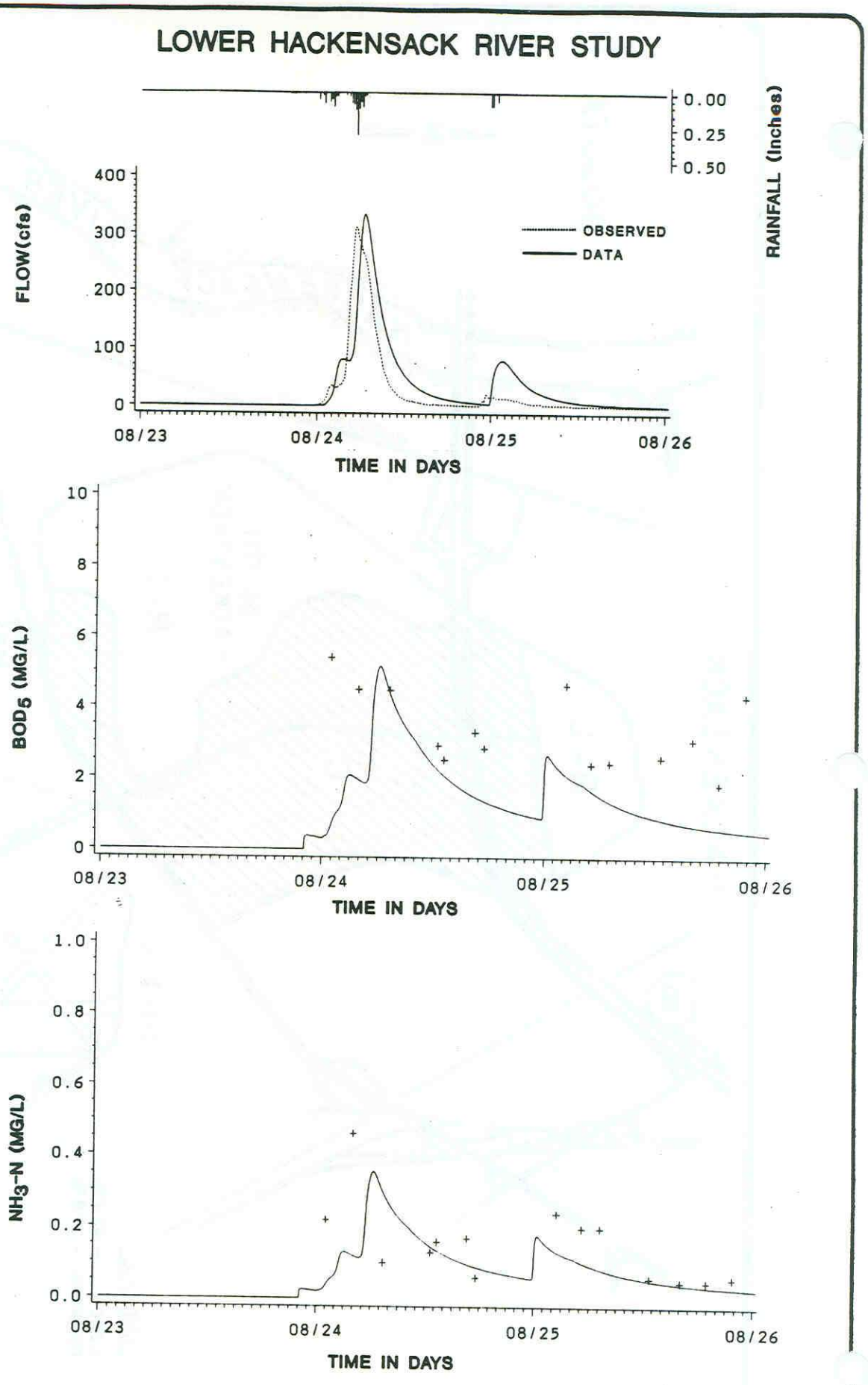
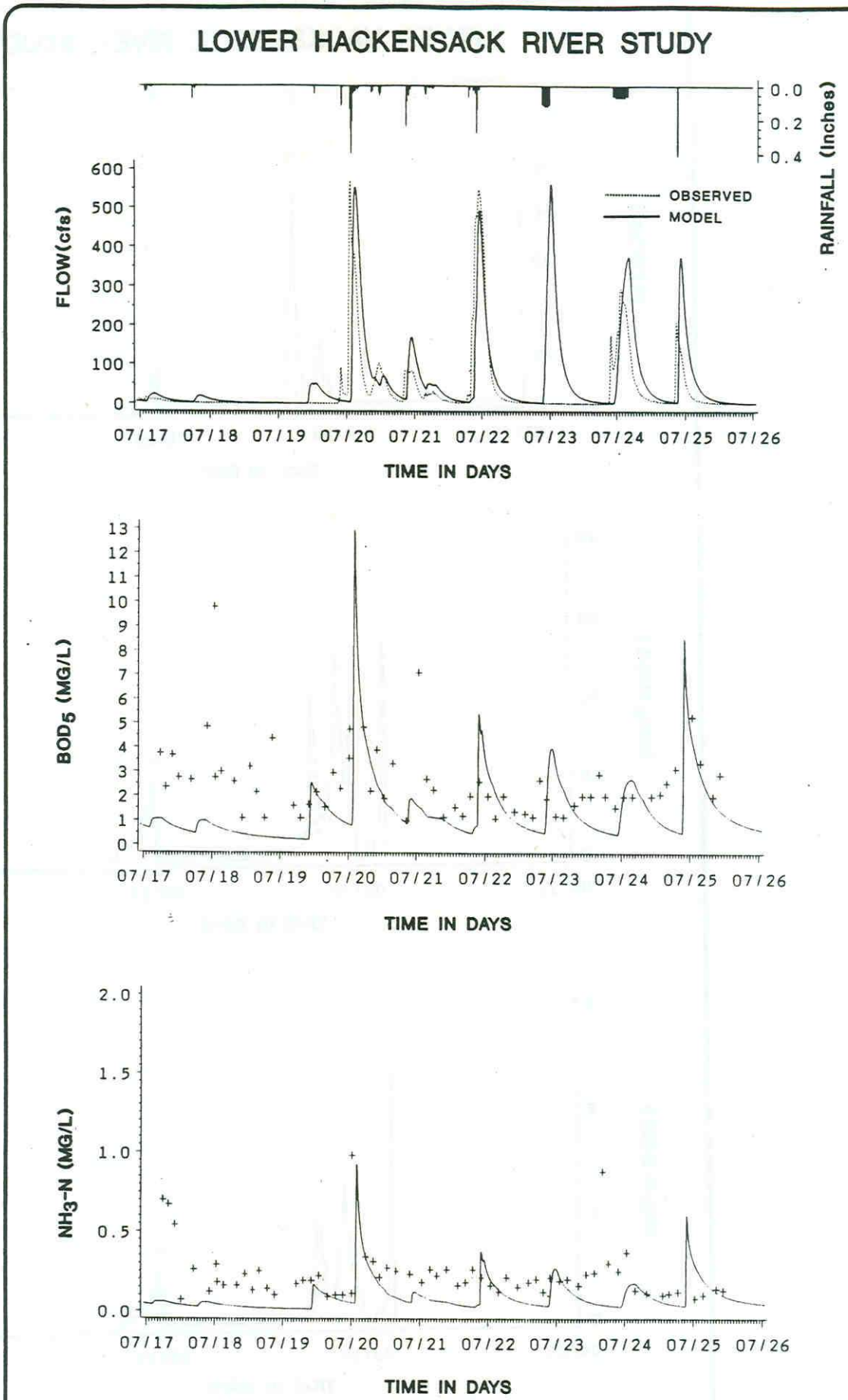

LOWER HACKENSACK RIVER STUDY
0.00
0.25
0.50
RAINFALL (Inches)
400
300
200
100
0
FLOW(cfs)
OBSERVED
DATA
08/23
08/24
08/25
08/26
TIME IN DAYS
10
8
6
4
2
0
BOD5 (MG/L)
08/23
08/24
08/25
08/26
TIME IN DAYS
1.0
0.8
0.6
0.4
0.2
0.0
NH3-N (MG/L)
08/23
08/24
08/25
08/26
TIME IN DAYS
SWMM MODEL VERIFICATION
SAUN STORM SEWER - AUGUST 1988

Figure 4.8



SWMM MODEL CALIBRATION
SAUN STORM SEWER - JULY 1988

Figure 4.7

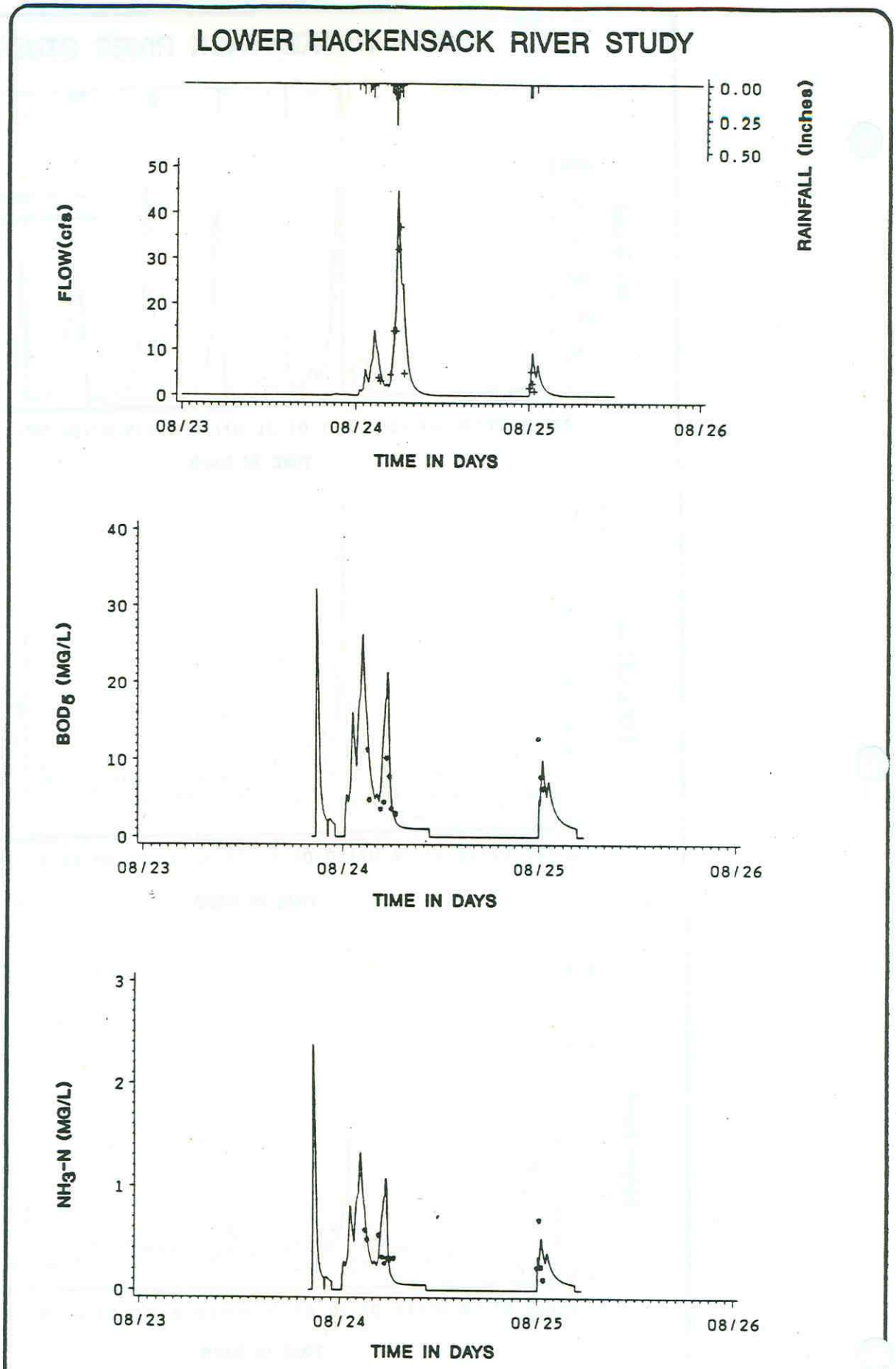

LOWER HACKENSACK RIVER STUDY
0.00
0.25
0.50
RAINFALL (Inches)
50
40
30
20
10
0
FLOW(cfs)
08/23
08/24
08/25
08/26
TIME IN DAYS
40
30
20
10
0
BOD5 (MG/L)
08/23
08/24
08/25
08/26
TIME IN DAYS
3
2
1
0
NH3-N (MG/L)
08/23
08/24
08/25
08/26
TIME IN DAYS
SWMM MODEL VERIFICATION
NEW MILFORD STORM SEWER - AUGUST 1988

Figure 4.6

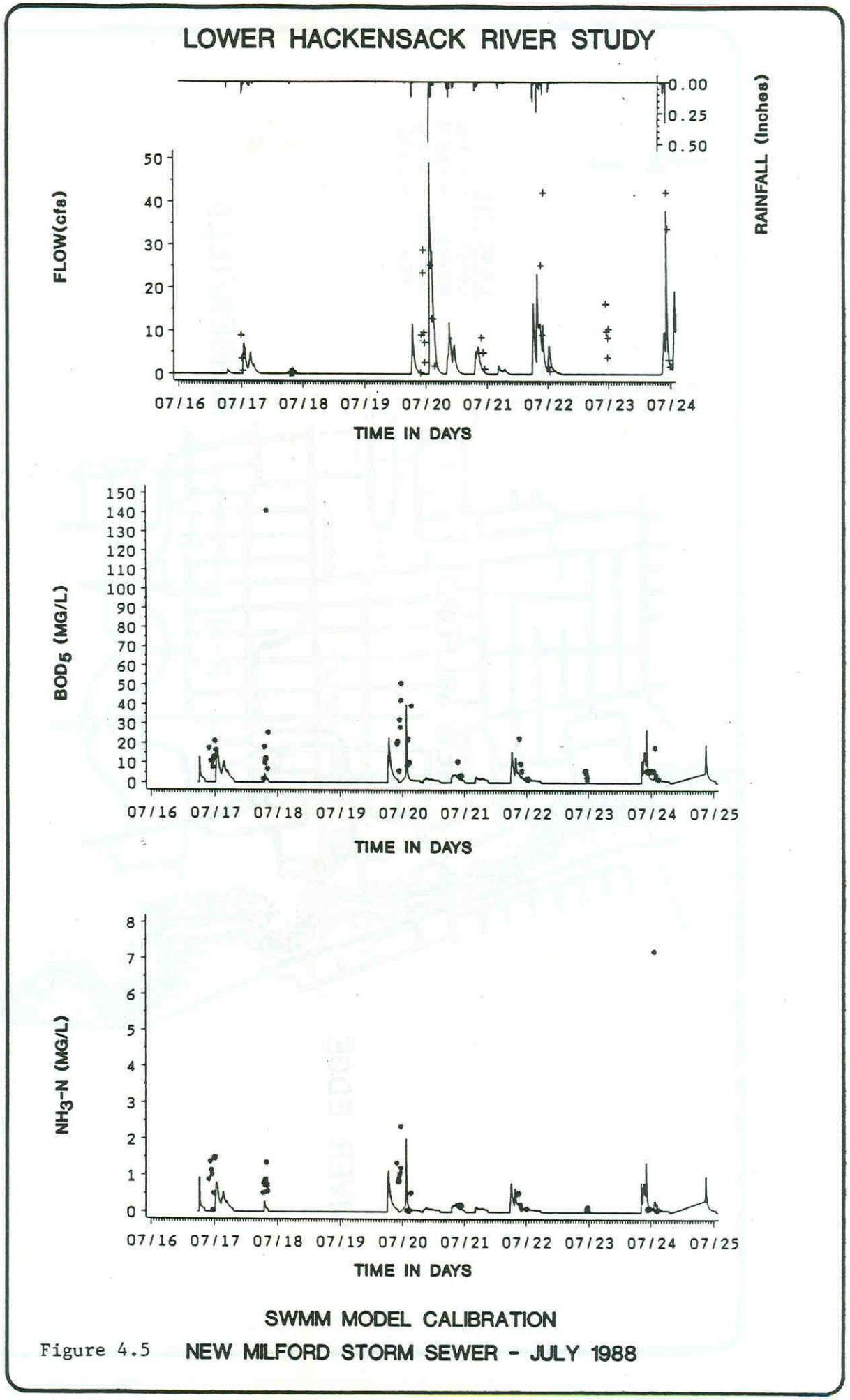

LOWER HACKENSACK RIVER STUDY
FLOW(cfs)
RAINFALL (Inches)
0.00
0.25
0.50
50
40
30
20
10
0
07/16 07/17 07/18 07/19 07/20 07/21 07/22 07/23 07/24
TIME IN DAYS
BOD5 (MG/L)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
07/16 07/17 07/18 07/19 07/20 07/21 07/22 07/23 07/24 07/25
TIME IN DAYS
NH3-N (MG/L)
8
7
6
5
4
3
2
1
0
07/16 07/17 07/18 07/19 07/20 07/21 07/22 07/23 07/24 07/25
TIME IN DAYS
SWMM MODEL CALIBRATION
NEW MILFORD STORM SEWER - JULY 1988

Figure 4.5

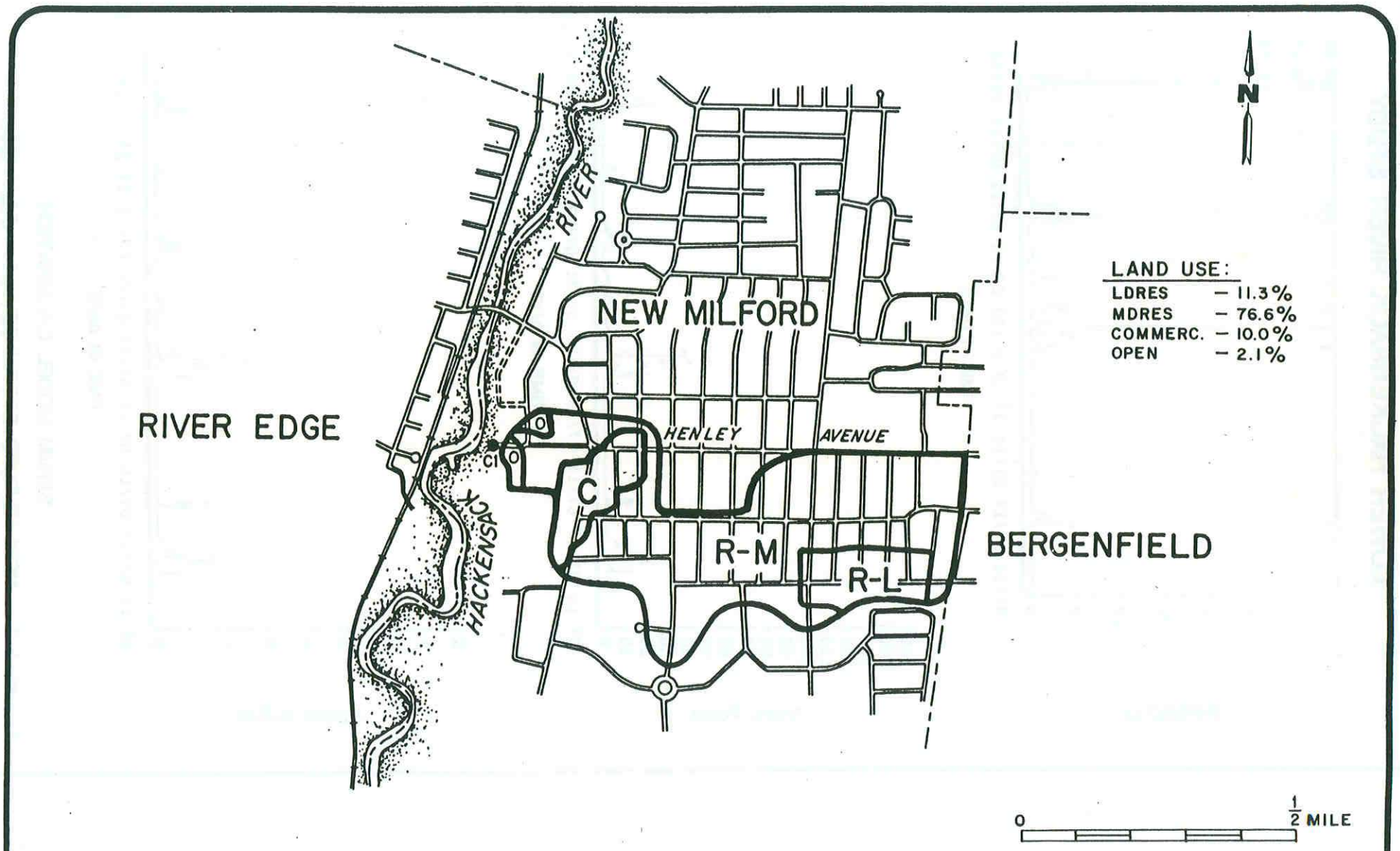


Figure 4.4: New Milford Sub-Basin Delineation

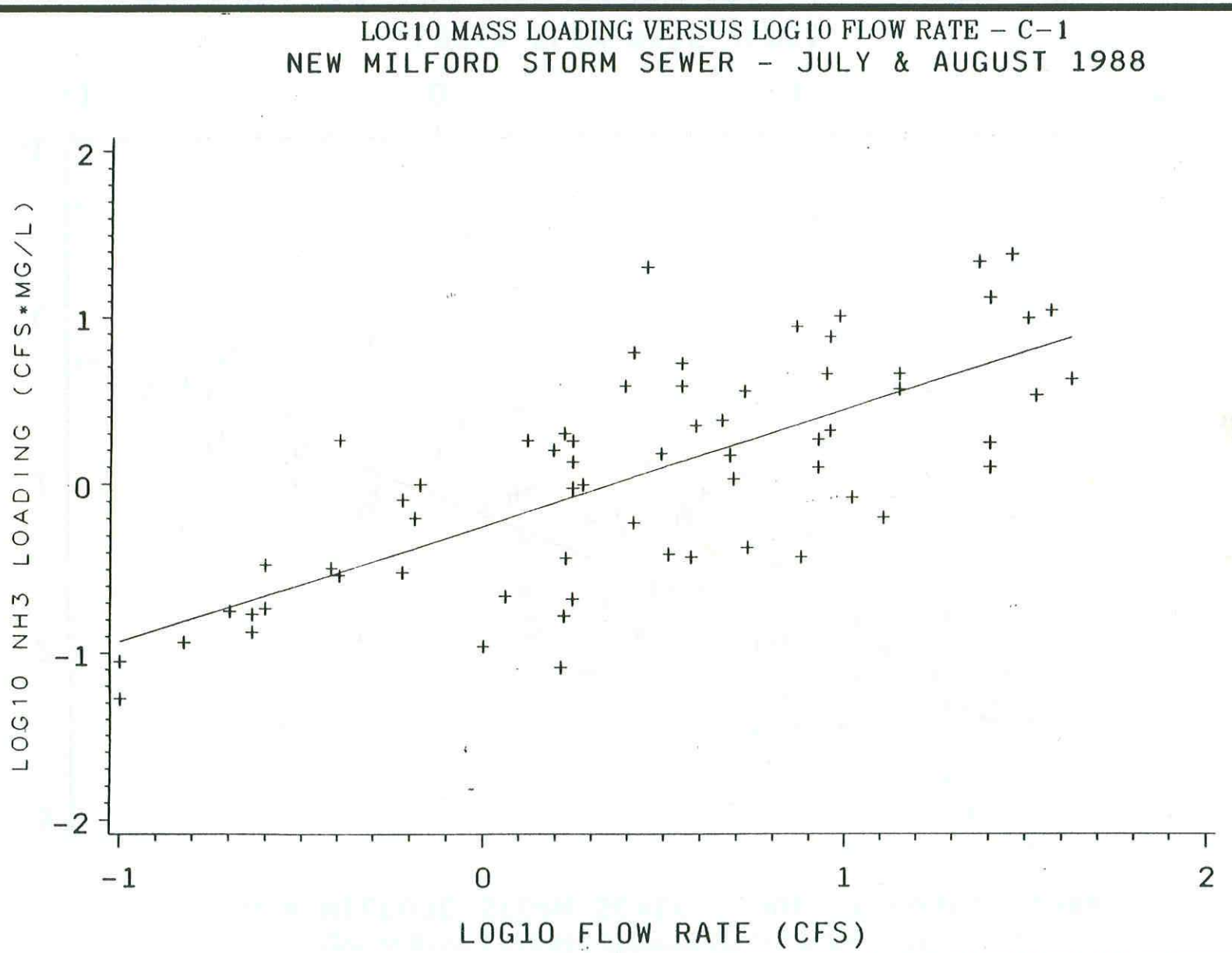


Figure 4.3(b): Mass Loading versus Flow Rate - NH_3-N

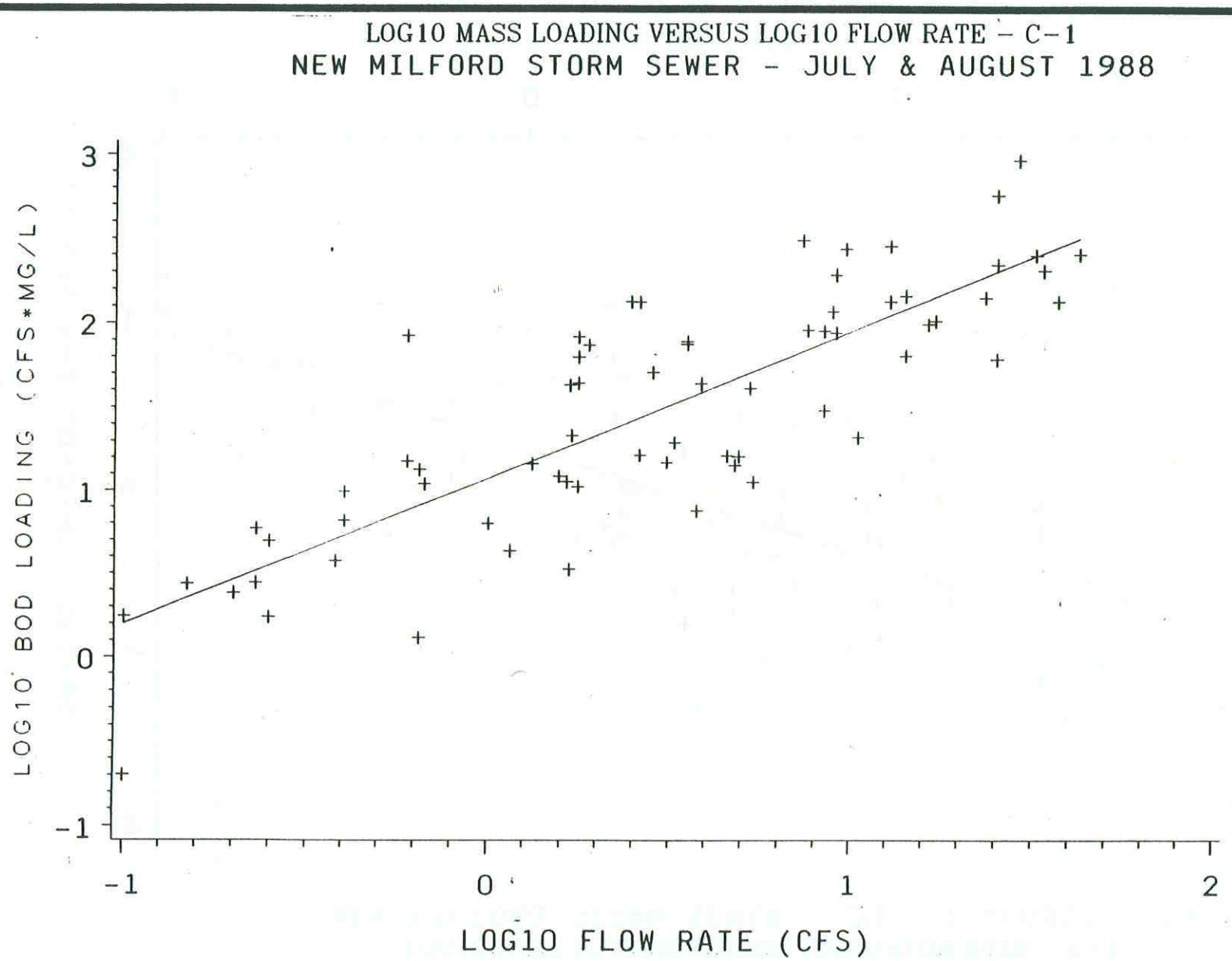


Figure 4.3(a): Mass Loading versus Flow Rate, New Milford Storm Sewer - BOD

Table 3.3 - Combined Sewer Overflows, Storm Sewers and Power Plant Discharges Monitored

Overflow Number	Description	Approximate Miles Upstream of Newark Bay Boundary	Type
C2	Anderson Street Overflow (Hackensack)	16.7	CSO
C3 & C3A*	Court Street Overflow (Hackensack)	15.5	CSO
C4	Paulson Street Overflow (Ridgefield Park)	14.0	CSO
C5	Elm Street Overflow (Ridgefield Park)	13.4	CSO
C6	North Bergen Overflow (Ridgefield Park)	--	CSO
C9 & C9A*	Sip Avenue Overflow (Jersey City)	2.0	CSO
C12 & C12A*	St. Paul Avenue Overflow (Jersey City)	3.3	CSO
C7	Manhattan Avenue Overflow (Jersey City)	1.3	CSO
--	BCUA Bypass (Little Ferry) (no overflow in 1988)	12.4	Bypass
C1	New Milford Storm Sewer	--	Storm Sewer
C8	Kearney Storm Sewer	--	Storm Sewer
C13	East Riser Ditch at Route 46	--	Storm Sewer
C14	Upper Overpeck Creek	--	Storm Sewer
P15	PSE&G Dischrge #1 (Ridgefield)	12.6	Power Plant Discharge

* CSO Land Use Stations

- Corresponding water quality data at these locations during the observed storm events

Detailed engineering information on the different subcatchments were obtained through the relevant township and county engineering offices within the study area. Whenever such engineering data were unavailable or lacking, they were supplemented by field investigations. Relevant information on the description of the CSO chambers were available in two previous infiltration/inflow and CSO studies conducted in both Bergen and Hudson Counties. Land use data was extracted from maps prepared by County Planning Boards, HMDC, and supplemented with information contained in current aerial photography. Detailed information on the soil types were extracted from maps prepared by the U.S. Soil Conservation Service.

Rainfall data was collected at several locations within the watershed as stated earlier. The gages were located to provide an accurate spatial description of rainfall variations within the basin. The locations of these gages are shown in Figure 3.3. During the rainfall events, additional rainfall gages were located in the vicinity of most CSO and storm sewer catchments. Two long-term stations maintained by NWS at Newark Airport and Hackensack Water Company near the Oradell Dam were used to generate continuous rainfall data within the watershed. Fifteen minute rainfall data was collected at these temporary stations, while hourly data was collected at the long-term stations. The collected rainfall database was used as the basic input to the SYNOP and SWMM-4 models.

To achieve runoff model calibration and verification, hydraulic and water quality data were collected at three major CSO locations and five storm sewer areas. Table 3.3 shows the locations and frequency of monitoring at all the CSO and storm sewers. Data was collected during the storm events that occurred during July 16-25, August 23-29, October 21, 1988 May 1-2, 1989, May 23-24, 1989 and October 17 and 31, 1989,

Table 2.3 - Major STP and Industrial Loading Data

Name	Avg. Flow (MGD)	Avg. [BOD_5] (lbs/day)	208 Planned Flows (MGD)
STP DISCHARGES			
Bergen County Sewerage Auth. (S)	82.0	27,355	82.6 - Level III
North Bergen-Central & Northern (S)	3.7	3,836	10.0 - Level III
Secaucus (S)	1.2	350	5.12 - Level III
N. Arlington (P)	1.7	1,353	Diverted to PVSC
Rutherford (S)	3.1	5,817	Diverted to BCUA
Woodridge (P)	0.6	133	Phased out to BCUA
Jersey City West (P)	15.8	17,026	Diverted to PVSC
Kearny (P)	2.0	353	Phased out to PVSC by 12/90
INDUSTRIAL DISCHARGES			
Henkel Corp.	1.5	313	---
PSE&G - Ridgefield	455.0	N/A	---
PSE&G - Jersey City	835.0	N/A	---
PSE&G - Kearny	212.0	N/A	---

NOTE: (P) - Primary ; (S) - Secondary

SOURCES: NJDEP, June 1985

In addition to discharges from STP's and Industrial sources, the tidal River receives pollutant discharges from both combined sewer overflows and storm sewers serving the municipalities of the basin. Table 2.4 and Figure 2.5 list all the **major** CSOs and bypass discharges into the lower Hackensack River.

surface and bottom concentrations for most other water quality constituents also support this finding. **In any case, the relatively large temporal variations and small vertical variations in the data justify the use of a transient-state, one-dimensional model for this study.**

Figure 2.4 shows similar longitudinal profiles of dissolved oxygen (DO) for the same April and August Surveys. Mean April dissolved oxygen levels ranged from a minimum of almost about 6 mg/l (at river mile 13.7) to about 9 mg/l over the lower and middle reaches of the estuary. A maximum mean concentration of about 12 mg/l occurred in the upper estuary at river mile 18. During the August survey, much lower mean DO levels were recorded. Throughout the lower and middle reaches of the estuary, the mean DO concentration violated NJDEP standards, ranging from 1.8 mg/l at river mile 13.7 to about 3 mg/l at river mile 1.4, respectively. At River mile 18, however, a mean DO concentration of 5.5 mg/l was observed during the August survey. In any case, a sag in the mean DO profiles occurs between river miles 10.8 and 13.7 - in the vicinity of both the BCUA's STP and the PSE&G thermal power plant at Ridgefield.

2.2 Point and Non-Point Sources

2.2.1 Point Sources

Although BCUA's STP is the largest facility discharging into the tidal Hackensack, several other municipal and industrial wastewater treatment plants contribute significant wasteloads to the lower Hackensack River. Table 2.3 lists the characteristics of these **major** discharges and Figure 2.5 shows their locations within the basin. In the case of industrial sources, only discharges which contributed large C-BOD and N-BOD loads were included in this study.

Table 2.5 - Landfills in the Study Area

No.	Landfill Name	Size* (ac)	Runoff Areal Loading (lbs/year) BOD_5*	BOD_5**	NH_3-N**
1	1947 Corporation	59	505,000	137,819	196,664
2	Mall Landfill	65	556,000	151,835	216,664
3	Kearny:				
	MLSA 1-D	94	710,000	219,580	313,328
	MSLA 1-A	60	1,800,000	Contained	
	MSLA Keegan	30	N/A	70,077	100,000
	Old MSLA	30	N/A	70,077	100,000
	280 Landfill	42	N/A	98,108	139,996
4	HMDC 1-C	212	N/A	495,217	706,690
	HMDC - Baler (C. Egan and P&M)	195	N/A	455,506	650,000
5	Avon Landfill Corp.	90	770,000	210,233	300,000
	Kingsland Park Disp. Area & Extension	180	N/A	Contained	
6	Lyndhurst Landfill	120	N/A	280,311	400,000
7	Rutherford	62	N/A	144,868	206,700
8	Esposito Const.	9	77,000	21,090	30,045
9	Village of Ridg. Park	45	389,000	105,160	150,075
10	Bergen Cty. SWDA	45	389,000	105,160	150,075

Source: * Northeast 208 Study
** Current Study (Based on results of Marsh Study - Part II)

Note: Current study revealed much lower pollutant loads from the landfills

3. FIELD MONITORING PROGRAM

To provide a real-time data base for calibration and verification of the River Model (MIT-DNM) and the Runoff Model (SWMM-4), a comprehensive data collection effort was conducted in 1988 and 1989. The detail data collection program was designed to achieve the following objectives:

1. To calibrate and verify the two models under ambient (dry weather) conditions

2. To calibrate and verify the two models under storm conditions.

During the year 1988, four periods of continuous sampling were performed. These included two periods of no storms (dry weather) (April 12-22 and July 11-16) and two periods during storm events (July 16-25 and August 23-29). The sampling periods were chosen to reflect changes within the lower Hackensack River ecosystem (see Figure 3.1) during periods of high spring runoff and low summer low runoff, respectively.

In addition to these data, tidal marsh data were collected in November 1988, July and August 1989, respectively, to estimate nutrient fluxes from the extensive tidal marshes in the lower Hackensack River.

The activity of benthic microphytes in the main stem of the Hackensack River were monitored at five locations eight times between June 1988 and April 1989.

This comprehensive database was used to calibrate/verify the mathematical models and compute the other sources/sinks of nutrients into the lower Hackensack River. The application of these data to the specific models is elaborated upon in the following sections.

Table 2.4 - Major CSOs and STP Bypass Data

Basin Name	Total Area (acres)	CSO Area (acres)	Average Dry Weather Flow			Interceptor Capacity (cfs)
			Flow (cfs)	BOD_5 (ppm)	NH_3-N (ppm)	
Anderson Street - Hackensack	510	510	1.00	136.5	13.6	4.66
Court Street - Hackensack	478	478	2.40	243.2	17.9	7.30
Ridgefield Park*	452	452	1.57	207.3	15.8	4.72
North Bergen*	1095	523	1.71	109.2	11.1	7.20
Jersey City North*	871	871	5.67	111.8	5.6	15.00
Jersey City South*	1170	1170	8.47	130.0	11.8	20.10
BYPASSES						
BCUA Plant (Little Ferry)	--	--	--	--	--	--

* Total of several CSO's in each service area.

The waters of the tidal Hackensack and its tributaries are used as sources of cooling water to three fossil fuel generating stations owned and operated by PSE&G. These plants are referred to as the Bergen, Hudson, and Kearny Generating Stations. One of these stations, the Bergen Generating Station, withdraws water from Overpeck Creek, a tributary of tidal Hackensack, and discharges heated water via a channel, to the tidal Hackensack in the vicinity of the outfalls of BCUA's STP. This "once-through" cooling system discharges excess heat to the estuary at a maximum rate of $2{,}378X10^6$ BTU/hr. (PSE&G, 1988).

In addition to the dischargers listed above, several major landfills discharge leachate through groundwater to the lower Hackensack estuary. The locations of these landfills are shown in Figure 2.6. Several previous studies have provided different estimates of pollutant loadings from these landfills. Table 2.5 is referenced in the Northeast 208 study and other recent studies of the watershed. Review of this data indicates that these landfills contribute a sizeable pollutant load to the lower Hackensack River. **Such large contributions were not reflected in the extensive data collected in the lower Hackensack River in 1988.** The loads presented in Table 2.5 were computed based on "areal loading rates" of pollutants rather than on field observations. More realistic loading rates were generated in this study for the major landfills. The details of these computations are presented in Part II of this report.

2.2.2 Non-Point Sources

The major non-point sources to the system are: Stormwater Runoff, Tidal Marshes and Benthic Release/Uptake. Stormwater Runoff constitutes a large pollutant load to the lower Hackensack River during storm events. Extensive urbanization in the upper half of the watershed accounts for a major portion of the load. Together with the stormwater load, the marsh ecosystem can act as a seasonal source or sink of nutrients. To estimate the pollutant loads from these two sources, an extensive data collection and modeling effort was conducted as part of this study, The details of the runoff modeling phase are contained in Chapter 4 of this report, while the results of the marsh phase are contained in Part II of this study.

Benthic loads can be another significant source of nutrients and a sink for the DO regime of the River. This becomes more significant in a nutrient rich system like the lower Hackensack River. Accordingly, a year-long experiment was conducted at five locations within the River in 1988 and 1989. Based on these data, the nutrient fluxes and sediment oxygen demand was computed along the entire stretch of the River. The details of this experiment are presented in Chapter 3.

Oradell Reservoir (U.S. Army Corps of Engineers, 1982). Below the Oradell Dam, the average slope of the tidal River is 1.7 feet per mile.

The overall shape of the tidal River channel is characterized by a relatively low depth-to-width ratio, and a slow seaward increase in depth. The mouth of the tidal River has an approximate width of 0.5 miles and a mean low water depth of 30 feet. Near the head of the estuary, the width decreases to a few hundred feet. It is navigable over a major portion of the estuary. The U.S Army Corps of Engineers (1986) has established a navigational channel in the tidal Hackensack with the following specifications:

> A channel in the Hackensack River, 34 ft. deep in rock and 32 ft. deep in soft material, 40 ft. wide from the upper end of Newark Bay channel to C.R.R. of N.J. Bridge, length 1.1 miles; thence with the same depths and 300 feet wide, to a point about 2,000 ft. north of the D.L. & W.R.R. Bridge, length 2.8 miles, with a turning basin 25 ft. deep at the upper end of the channel; thence 15 ft. deep, 200 ft. wide, to Little Ferry, 10.1 miles; thence 150 ft. wide, to the Court Street Bridge, length 2.3 miles. Total length about 16.3 miles.

2.1.2 Hydrologic and Tidal Characteristics

The U.S.G.S. maintains a continuous streamflow monitoring gage at New Milford, New Jersey, below the Oradell Dam of the Hackensack Water Company. The drainage area at this location is 113 square miles with a long-term average freshwater inflow of 99 cubic feet per second (cfs). Oradell Dam separates the non-tidal Upper Hackensack River and the tidal Lower Hackensack River. The U.S.G.S. reports an extreme maximum flow of 4,500 cfs at this station. Relatively high freshwater inflows to the estuary occur during winter and spring months at the head of tide. Extreme minimum flows of 0 cfs are reported for many days of most years. In fact, long-term

U.S.G.S. data indicate that "quite often periods of no flow have been observed up to several months (for example, the five month period from September 1970 through January 1971)." This occurrence of extended periods of no flow from the upper Hackensack River is anticipated to prevail as withdrawals of potable water from upstream reservoirs are increased.

The drainage area for the tidal reaches of the Lower Hackensack River is approximately 84 sq. mi. Additional sources of freshwater flow in this estuarine section occur through the following small tributaries (Jack McCormick & Associates, 1977; NOAA 1984):

Table 2.1 - Lower Hackensack River Basin Tributary Characteristics

Tributary	Distance Above Mouth (River Miles)	Drainage Area (Square miles)	Flow** (cfs)
Penhorn Creek*	3.7	3.8	7.9
Saw Mill Creek	5.5	2.0	4.2
Kingsland Creek	6.3	1.5	3.1
Berry's Creek*	7.9	1.5	3.1
Berry's Creek Canal	8.2	8.4	15.8
Bashes Creek	9.4	0.7	1.5
Moonachie Creek*	9.5	1.1	2.3
Mill Creek	9.9	0.9	2.0
Cromakill Creek	10.0	5.1	9.9
Bellmans Creek	10.7	3.8	7.9
Doctors Creek*	11.2	0.3	0.6
Losen Slofe*	11.8	1.8	3.7
Overpeck Creek*	13.4	17.1	33.6
Coles and Mill Brook	19.0	7.6	15.8
French Brook	19.1	1.0	2.1

* Tide gate restricts tidal flow
** Average Annual Flow (Mattson, 1976)

Drainage Sub-basin: HIRSH

Soil Type	ACRES	% AC	2915.4	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	1542.7	55.16	1608.2	8	4.413	0.22	0.121	0.31	0.171
C	880.3	31.48	917.7	10	3.148	0.1	0.031	0.26	0.082
D	373.6	13.36	389.5	12	1.603	0.03	0.004	0.21	0.028
RIVER	0	0	0.0	0	0	0	0.000	0	0.000
WTD AVE	2796.6	100	2915.4		9.164		0.157		0.281

Land Use	ACRES	% AC	2915.4		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	1870.7	66.01	1924.6	0.38	25.1%	0.211	0.13929	0.015	0.0099
HDRES	27.6	0.97	28.4	0.65	0.6%	0.24	0.00234	0.018	0.00018
INDST	224.3	7.92	230.8	0.72	5.7%	0.325	0.02572	0.044	0.00348
COMM	284.9	10.05	293.1	0.85	8.5%	0.895	0.08998	0.045	0.00452
OPEN	426.3	15.043	438.6	0	0.0%	0.058	0.00873	0.0029	0.00044
WTD AVE	2833.8	100	2915.4		40.0%		0.26606		0.01852

Drainge Sub-basin: KEARNY

Soil Type	ACRES	% AC	1437.9	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8	0.000	0.22	0.000	0.31	0.000
C	0	0.00	0.0	10	0.000	0.1	0.000	0.26	0.000
D	1072.9	75.90	1091.3	12	9.108	0.03	0.023	0.21	0.159
RIVER	340.7	24.102	346.6	12	2.892	0.03	0.007	0.21	0.051
WTD AVE	1413.6	100	1437.9		12.000		0.030		0.210

Land Use	ACRES	% AC	1437.9		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	0	0.00	0.0	0.38	0.0%	0.211	0	0.015	0
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	855.4	60.41	868.6	0.72	43.5%	0.325	0.19632	0.044	0.02658
COMM	7.1	0.50	7.2	0.85	0.4%	0.895	0.00449	0.045	0.00023
OPEN	553.6	39.093	562.1	0.9	35.2%	0.058	0.02267	0.0029	0.00113
WTD AVE	1416.1	100	1437.9		79.1%		0.22348		0.02794

Drainage Sub-basin: KENS

Soil Type	ACRES	% AC	672	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	254	38.58	259.2	8	3.086	0.22	0.085	0.31	0.120
C	342	51.94	349.1	10	5.194	0.1	0.052	0.26	0.135
D	62.4	9.48	63.7	12	1.137	0.03	0.003	0.21	0.020
RIVER	0	0	0.0	0	0	0	0.000	0	0.000
WTD AVE	658.4	100	672.0		9.418		0.140		0.275

Land Use	ACRES	% AC	672		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	500.4	74.78	502.5	0.38	28.4%	0.211	0.15778	0.015	0.01122
HDRES	45.5	6.80	45.7	0.65	4.4%	0.24	0.01632	0.018	0.00122
INDST	29.7	4.44	29.8	0.72	3.2%	0.325	0.01442	0.044	0.00195
COMM	3.6	0.54	3.6	0.85	0.5%	0.895	0.00481	0.045	0.00024
OPEN	90	13.449	90.4	0	0.0%	0.058	0.0078	0.0029	0.00039
WTD AVE	669.2	100	672.0		36.5%		0.20113		0.01503

Drainage Sub-basin: LOSEN

Soil Type	ACRES	% AC	1482	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8	0.000	0.22	0.000	0.31	0.000
C	349	24.60	364.6	10	2.460	0.1	0.025	0.26	0.064
D	783.7	55.24	818.7	12	6.629	0.03	0.017	0.21	0.116
RIVER	286	20.159	298.8	12	2.419	0.03	0.006	0.21	0.042
WTD AVE	1418.7	100	1482.0		11.508		0.047		0.222

Land Use	ACRES	% AC	1482		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	197.9	13.52	200.3	0.38	5.1%	0.211	0.02852	0.015	0.00203
HDRES	6.9	0.47	7.0	0.65	0.3%	0.24	0.00113	0.018	0.00008
INDST	549.8	37.55	556.5	0.72	27.0%	0.325	0.12204	0.044	0.01652
COMM	8.2	0.56	8.3	0.85	0.5%	0.895	0.00501	0.045	0.00025
OPEN	701.4	47.903	709.9	0	0.0%	0.058	0.02778	0.0029	0.00139
WTD AVE	1464.2	100	1482.0		33.0%		0.18448		0.02028

Drainage Sub-basin: MILFORD

Soil Type	ACRES	% AC	1493.4	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	707.7	50.62	756.0	8 4.050	0.22	0.111	0.31	0.157
C	477.8	34.18	510.4	10 3.418	0.1	0.034	0.26	0.089
D	212.3	15.19	226.8	12 1.822	0.03	0.005	0.21	0.032
RIVER	0.2	0.0143	0.2	0 0	0	0.000	0	0.000
WTD AVE	1398	100	1493.4	9.290		0.150		0.278

Land Use	ACRES	% AC	1493.4		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	795.2	55.76	832.8	0.38	21.2%	0.211	0.11766	0.015	0.00836
HDRES	24.1	1.69	25.2	0.65	1.1%	0.24	0.00406	0.018	0.0003
INDST	208.8	14.64	218.7	0.72	10.5%	0.325	0.04759	0.044	0.00644
COMM	81.7	5.73	85.6	0.85	4.9%	0.895	0.05128	0.045	0.00258
OPEN	316.2	22.174	331.1	0	0.0%	0.058	0.01286	0.0029	0.00064
WTD AVE	1426	100	1493.4		37.7%		0.23344		0.01833

Drainage Sub-basin: MOONACHI

Soil Type	ACRES	% AC	1473.65	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	47	3.23	47.6	10 0.323	0.1	0.003	0.26	0.008
D	1368	94.10	1386.7	1211.292	0.03	0.028	0.21	0.198
RIVER	38.8	2.6689	39.3	12 0.32	0.03	0.001	0.21	0.006
WTD AVE	1453.8	100	1473.7	11.935		0.032		0.212

Land Use	ACRES	% AC	1473.65		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	16.2	1.11	16.3	0.38	0.4%	0.211	0.00234	0.015	0.00017
HDRES	0.3	0.02	0.3	0.65	0.0%	0.24	0.00005	0.018	3.69E-06
INDST	443.9	30.37	447.5	0.72	21.9%	0.325	0.09869	0.044	0.01336
COMM	23.7	1.62	23.9	0.85	1.4%	0.895	0.01451	0.045	0.00073
OPEN/MARSH	977.7	66.883	985.6	0.9	60.2%	0.058	0.03879	0.0029	0.00194
WTD AVE	1461.8	100	1473.7		83.9%		0.15438		0.0162

Drainage Sub-basin: OPECK

Soil Type	ACRES	% AC	3247.8	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	748.8	23.85	774.6	8 1.908	0.22	0.052	0.31	0.074
C	1963.1	62.53	2030.8	10 6.253	0.1	0.063	0.26	0.163
D	416.7	13.27	431.1	12 1.593	0.03	0.004	0.21	0.028
RIVER	10.9	0.3472	11.3	12 0.042	0.03	0.000	0.21	0.001
WTD AVE	3139.5	100	3247.8	9.795		0.119		0.265

Land Use	ACRES	% AC	3247.8		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	1864.5	58.33	1894.6	0.38	22.2%	0.211	0.12309	0.015	0.00875
HDRES	51	1.60	51.8	0.65	1.0%	0.24	0.00383	0.018	0.00029
INDST	398.4	12.46	404.8	0.72	9.0%	0.325	0.04051	0.044	0.00548
COMM	162.4	5.08	165.0	0.85	4.3%	0.895	0.04548	0.045	0.00229
OPEN	719.9	22.524	731.5	0	0.0%	0.058	0.01306	0.0029	0.00065
WTD AVE	3196.2	100	3247.8		36.5%		0.22597		0.01746

Drainage Sub-basin: PENHORN

Soil Type	ACRES	% AC	1659.6	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	630.5	37.99	630.5	10 3.799	0.1	0.038	0.26	0.099
D	1029	62.01	1029.1	12 7.441	0.03	0.019	0.21	0.130
RIVER	0	0	0.0	12 0	0.03	0.000	0.21	0.000
WTD AVE	1659.5	100	1659.6	11.240		0.057		0.229

Land Use	ACRES	% AC	1659.6		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	59.8	3.60	59.8	0.38	1.4%	0.211	0.0076	0.015	0.00054
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	878.2	52.93	878.4	0.72	38.1%	0.325	0.17201	0.044	0.02329
COMM	16.1	0.97	16.1	0.85	0.8%	0.895	0.00868	0.045	0.00044
OPEN/MARSH	705.2	42.5	705.3	0.7	29.7%	0.058	0.02465	0.0029	0.00123
WTD AVE	1659.3	100	1659.6		70.1%		0.21295		0.0255

Drainage Sub-basin: Ridgefield Park CSO

Soil Type	ACRES	% AC	452	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	261	65.71	297.0	8 5.257	0.22	0.145	0.31	0.204
C	114.9	28.93	130.8	10 2.893	0.1	0.029	0.26	0.075
D	21.3	5.36	24.2	12 0.644	0.03	0.002	0.21	0.011
RIVER	0	0	0.0	0 0	0	0.000	0	0.000
WTD AVE	397.2	100	452.0	8.793		0.175		0.290

Land Use	ACRES	% AC	452		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	380	66.90	302.4	0.38	25.4%	0.211	0.14116	0.015	0.01004
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	100	17.61	79.6	0.72	12.7%	0.325	0.05722	0.044	0.00775
COMM	30	5.28	23.9	0.85	4.5%	0.895	0.04727	0.045	0.00238
OPEN	58	10.211	46.2	0	0.0%	0.058	0.00592	0.0029	0.0003
WTD AVE	568	100	452.0		42.6%		0.25157		0.02045

Drainage Sub-basin: SACKIT

Soil Type	ACRES	% AC	3196.2	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	9.8	0.31	10.0	4 0.013	0.38	0.001	0.34	0.0011
B	696.6	22.34	714.2	8 1.788	0.22	0.049	0.31	0.069
C	1196.4	38.38	1226.6	10 3.838	0.1	0.038	0.26	0.100
D	946.9	30.37	970.8	12 3.645	0.03	0.009	0.21	0.064
RIVER	267.8	8.5902	274.6	12 1.031	0.03	0.003	0.21	0.018
WTD AVE	3117.5	100	3196.2	10.314		0.100		0.252

Land Use	ACRES	% AC	3196.2		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	1386.9	43.97	1405.5	0.38	16.7%	0.211	0.09279	0.015	0.0066
HDRES	25	0.79	25.3	0.65	0.5%	0.24	0.0019	0.018	0.00014
INDST	646.3	20.49	655.0	0.72	14.8%	0.325	0.0666	0.044	0.00902
COMM	321.3	10.19	325.6	0.85	8.7%	0.895	0.09118	0.045	0.00458
OPEN	774.4	24.554	784.8	0	0.0%	0.058	0.01424	0.0029	0.00071
WTD AVE	3153.9	100	3196.2		40.6%		0.26671		0.02105

Drainage Sub-basin: SAWMILL

Soil Type	ACRES	% AC	2544.7	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	457.7	18.19	462.9	10 1.819	0.1	0.018	0.26	0.047
D	1897.4	75.41	1919.0	12 9.050	0.03	0.023	0.21	0.158
RIVER	160.9	6.3951	162.7	12 0.767	0.03	0.002	0.21	0.013
WTD AVE	2516	100	2544.7	11.636		0.043		0.219

Land Use	ACRES	% AC	2544.7		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	26.7	1.05	26.8	0.38	0.4%	0.211	0.00222	0.015	0.00016
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	402.3	15.89	404.3	0.72	11.4%	0.325	0.05164	0.044	0.00699
COMM	3	0.12	3.0	0.85	0.1%	0.895	0.00106	0.045	0.00005
OPEN/MARSH	2100.1	82.939	2110.6	0.9	74.6%	0.058	0.0481	0.0029	0.00241
WTD AVE	2532.1	100	2544.7		86.6%		0.10303		0.00961

Drainage Sub-basin: SECAUCUS

Soil Type	ACRES	% AC	1313.3	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	542.7	41.48	544.8	10 4.148	0.1	0.041	0.26	0.108
D	757.2	57.88	760.2	12 6.946	0.03	0.017	0.21	0.122
RIVER	8.3	0.6345	8.3	12 0.076	0.03	0.000	0.21	0.001
WTD AVE	1308.2	100	1313.3	11.170		0.059		0.231

Land Use	ACRES	% AC	1313.3		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	295.7	22.56	296.3	0.38	8.6%	0.211	0.0476	0.015	0.00338
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	440.2	33.59	441.1	0.72	24.2%	0.325	0.10915	0.044	0.01478
COMM	3.9	0.30	3.9	0.85	0.3%	0.895	0.00266	0.045	0.00013
OPEN/MARSH	570.9	43.557	572.0	0.8	34.8%	0.058	0.02526	0.0029	0.00126
WTD AVE	1310.7	100	1313.3		67.9%		0.18468		0.01956

Drainage Sub-basin: SECON

Soil Type	ACRES	% AC	618.7	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	8.8	1.44	8.9	10 0.144	0.1	0.001	0.26	0.004
D	503.8	82.19	508.5	12 9.862	0.03	0.025	0.21	0.173
RIVER	100.4	16.378	101.3	12 1.965	0.03	0.005	0.21	0.034
WTD AVE	613	100	618.7	11.971		0.031		0.211

Land Use	ACRES	% AC	618.7		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	0	0.00	0.0	0.38	0.0%	0.211	0	0.015	0
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	161.9	26.35	163.0	0.72	19.0%	0.325	0.08563	0.044	0.01159
COMM	0	0.00	0.0	0.85	0.0%	0.895	0	0.045	0
OPEN/MARSH	452.6	73.653	455.7	0.8	58.9%	0.058	0.04272	0.0029	0.00214
WTD AVE	614.5	100	618.7		77.9%		0.12835		0.01373

Drainage Sub-basin: TEAN

Soil Type	ACRES	% AC	3924.4	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	546	14.64	574.3	8 1.171	0.22	0.032	0.31	0.045
C	2079.8	55.75	2187.8	10 5.575	0.1	0.056	0.26	0.145
D	883.7	23.69	929.6	12 2.842	0.03	0.007	0.21	0.050
RIVER	221.2	5.9292	232.7	12 0.712	0.03	0.002	0.21	0.012
WTD AVE	3730.7	100	3924.4	10.300		0.097		0.253

Land Use	ACRES	% AC	3924.4		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	1668.7	43.14	1693.1	0.38	16.4%	0.211	0.09103	0.015	0.00647
HDRES	81.5	2.11	82.7	0.65	1.4%	0.24	0.00506	0.018	0.00038
INDST	536.6	13.87	544.4	0.72	10.0%	0.325	0.04509	0.044	0.0061
COMM	231.8	5.99	235.2	0.85	5.1%	0.895	0.05364	0.045	0.0027
OPEN	1349.3	34.885	1369.0	0	0.0%	0.058	0.02023	0.0029	0.00101
WTD AVE	3867.9	100	3924.4		32.8%		0.21504		0.01666

Drainage Sub-basin: TETAIR

Soil Type	ACRES	% AC	898.5	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	214.6	24.26	218.0	10 2.426	0.1	0.024	0.26	0.063
D	669.9	75.74	680.5	12 9.089	0.03	0.023	0.21	0.159
RIVER	0	0	0.0	12 0	0.03	0.000	0.21	0.000
WTD AVE	884.5	100	898.5	11.515		0.047		0.222

Land Use	ACRES	% AC	898.5		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	169.6	19.48	175.0	0.38	7.4%	0.211	0.0411	0.015	0.00292
HDRES	1.7	0.20	1.8	0.65	0.1%	0.24	0.00047	0.018	0.00004
INDST	661.8	76.02	683.0	0.72	54.7%	0.325	0.24705	0.044	0.03345
COMM	16.8	1.93	17.3	0.85	1.6%	0.895	0.01727	0.045	0.00087
OPEN	20.7	2.3777	21.4	0	0.0%	0.058	0.00138	0.0029	0.00007
WTD AVE	870.6	100	898.5		63.9%		0.30728		0.03734

Drainage Sub-basin: TETER

Soil Type	ACRES	% AC	2823.6	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	3.1	0.11	3.2	4 0.004	0.38	0.000	0.34	0.0004
B	70.1	2.54	71.7	8 0.203	0.22	0.006	0.31	0.008
C	800.3	28.99	818.7	10 2.899	0.1	0.029	0.26	0.075
D	1880.3	68.12	1923.4	12 8.174	0.03	0.020	0.21	0.143
RIVER	6.5	0.2355	6.6	12 0.028	0.03	0.000	0.21	0.000
WTD AVE	2760.3	100	2823.6	11.310		0.056		0.227

Land Use	ACRES	% AC	2823.6		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	478.7	17.19	485.3	0.38	6.5%	0.211	0.03627	0.015	0.00258
HDRES	67.1	2.41	68.0	0.65	1.6%	0.24	0.00578	0.018	0.00043
INDST	1829.2	65.68	1854.4	0.72	47.3%	0.325	0.21345	0.044	0.0289
COMM	86.4	3.10	87.6	0.85	2.6%	0.895	0.02776	0.045	0.0014
OPEN/MARSH	323.8	11.626	328.3	0.8	9.3%	0.058	0.00674	0.0029	0.00034
WTD AVE	2785.2	100	2823.6		67.3%		0.29		0.03364

Drainage Sub-basin: WALDEN

Soil Type	ACRES	% AC	2390.8	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	377.2	16.07	384.3	10 1.607	0.1	0.016	0.26	0.042
D	1521.2	64.82	1549.7	12 7.778	0.03	0.019	0.21	0.136
RIVER	448.5	19.11	456.9	12 2.293	0.03	0.006	0.21	0.040
WTD AVE	2346.9	100	2390.8	11.679		0.041		0.218

Land Use	ACRES	% AC	2390.8		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	6.1	0.26	6.2	0.38	0.1%	0.211	0.00054	0.015	0.00004
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	366.5	15.46	369.6	0.72	11.1%	0.325	0.05025	0.044	0.0068
COMM	21.1	0.89	21.3	0.85	0.8%	0.895	0.00797	0.045	0.0004
OPEN/MARSH	1976.9	83.392	1993.7	0.9	75.1%	0.058	0.04837	0.0029	0.00242
WTD AVE	2370.6	100	2390.8		87.0%		0.10712		0.00966

Drainage Sub-basin: WOLMANS

Soil Type	ACRES	% AC	1842.6	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	29.5	1.67	30.8	4 0.067	0.38	0.006	0.34	0.0057
B	105.9	5.99	110.5	8 0.480	0.22	0.013	0.31	0.019
C	883.3	50.00	921.4	10 5.000	0.1	0.050	0.26	0.130
D	636.4	36.03	663.8	12 4.323	0.03	0.011	0.21	0.076
RIVER	111.4	6.3063	116.2	12 0.757	0.03	0.002	0.21	0.013
WTD AVE	1766.5	100	1842.6	10.627		0.082		0.243

Land Use	ACRES	% AC	1842.6		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	746.9	41.52	765.0	0.38	15.8%	0.211	0.08761	0.015	0.00623
HDRES	22.7	1.26	23.3	0.65	0.8%	0.24	0.00303	0.018	0.00023
INDST	214.9	11.95	220.1	0.72	8.6%	0.325	0.03883	0.044	0.00526
COMM	131.6	7.32	134.8	0.85	6.2%	0.895	0.06547	0.045	0.00329
OPEN/MARSH	682.8	37.957	699.4	0.8	30.4%	0.058	0.02201	0.0029	0.0011
WTD AVE	1798.9	100	1842.6		61.8%		0.21695		0.0161

Drainage Sub-basin: Anderson Street CSO

Soil Type	ACRES	% AC	510	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	224.8	44.62	227.6	8 3.570	0.22	0.098	0.31	0.138
C	12.2	2.42	12.4	10 0.242	0.1	0.002	0.26	0.006
D	262.9	52.18	266.1	12 6.262	0.03	0.016	0.21	0.110
RIVER	3.9	0.77	3.9	0 0.000	0	0.000	0	0.000
WTD AVE	503.8	100	510.0	10.074		0.116		0.254

Land Use	ACRES	% AC	510		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	314.6	62.57	319.1	0.38	23.8%	0.211	0.13202	0.015	0.00939
HDRES	47.1	9.37	47.8	0.65	6.1%	0.24	0.02248	0.018	0.00169
INDST	50.8	10.10	51.5	0.72	7.3%	0.325	0.03284	0.044	0.00445
COMM	54.1	10.76	54.9	0.85	9.1%	0.895	0.0963	0.045	0.00484
OPEN	36.2	7.20	36.7	0	0.0%	0.058	0.00418	0.0029	0.00021
WTD AVE	502.8	100	510.0		46.3%		0.28782		0.02057

Drainage Sub-basin: Court Street CSO

Soil Type	ACRES	% AC	477.9	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	42.8	9.02	43.1	8 0.722	0.22	0.020	0.31	0.028
C	27.9	5.88	28.1	10 0.588	0.1	0.006	0.26	0.015
D	403.7	85.08	406.6	1210.209	0.03	0.026	0.21	0.179
RIVER	0.1	0.0211	0.1	0 0	0	0.000	0	0.000
WTD AVE	474.5	100	477.9	11.519		0.051		0.222

Land Use	ACRES	% AC	477.9		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	177.9	37.54	179.4	0.38	14.3%	0.211	0.07921	0.015	0.00563
HDRES	65.2	13.76	65.8	0.65	8.9%	0.24	0.03302	0.018	0.00248
INDST	100.9	21.29	101.8	0.72	15.3%	0.325	0.0692	0.044	0.00937
COMM	55.4	11.69	55.9	0.85	9.9%	0.895	0.10463	0.045	0.00526
OPEN	74.5	15.721	75.1	0	0.0%	0.058	0.00912	0.0029	0.00046
WTD AVE	473.9	100	477.9		48.5%		0.29517		0.02319

Drainage Sub-basin: North Bergen CSO

Soil Type	ACRES	% AC	1095	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8	0.000	0.22	0.000	0.31	0.000
C	201.1	84.96	930.3	10	8.496	0.1	0.085	0.26	0.221
D	35.6	15.04	164.7	12	1.805	0.03	0.005	0.21	0.032
RIVER	0	0	0.0	0	0	0	0.000	0	0.000
WTD AVE	236.7	100	1095.0		10.301		0.089		0.252

Land Use	ACRES	% AC	1095		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	0	0.00	0.0	0.38	0.0%	0.211	0	0.015	0
HDRES	470.85	43.00	470.9	0.65	27.9%	0.24	0.1032	0.018	0.00774
INDST	240.9	22.00	240.9	0.72	15.8%	0.325	0.0715	0.044	0.00968
COMM	273.75	25.00	273.8	0.85	21.3%	0.895	0.22375	0.045	0.01125
OPEN	109.5	10	109.5	0	0.0%	0.058	0.0058	0.0029	0.00029
WTD AVE	1095	100	1095.0		65.0%		0.40425		0.02896

Summary of Jersey City CSO Area Characterstics

Jersey City North:

Tributary Area	Area (acres)	Area (acres) by Land Use MDRES	HDRES	Comm.	Indus.	Open/Pub	% Imp.
RW1	421	290	22	64	0	45	90
RW2	450	128	0	31	134	157	60
Total	871	418	22	95	134	202	74.5

Jersey City South:

Tributary Area	Area (acres)	Area (acres) by Land Use MDRES	HDRES	Comm.	Indus.	Open/Pub	% Imp.
RW3	261	30	24	4	194	9	66
RW4	109	13	14	18	59	5	72
RW5	71	38	12	8	11	2	89
RW6	219	99	29	22	22	47	80
RW7	220	68	24	7	0	121	56
RW8	290	138	6	38	10	98	68
Total	1170	386	109	97	296	282	69.2

Drainage Sub-basin: BERRYS

Soil Type	ACRES	% AC	1576.2	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	516.4	33.91	534.5	10 3.391	0.1	0.034	0.26	0.088
D	891.3	58.53	922.6	12 7.024	0.03	0.018	0.21	0.123
RIVER	115.1	7.5584	119.1	12 0.907	0.03	0.002	0.21	0.016
WTD AVE	1522.8	100	1576.2	11.322		0.054		0.227

Land Use	ACRES	% AC	1576.2		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	202.9	13.07	206.1	0.38	5.0%	0.211	0.02758	0.015	0.00196
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	296.2	19.09	300.8	0.72	13.7%	0.325	0.06203	0.044	0.0084
COMM	45	2.90	45.7	0.85	2.5%	0.895	0.02595	0.045	0.0013
OPEN/MARSH	1007.9	64.942	1023.6	0.8	52.0%	0.058	0.03767	0.0029	0.00188
WTD AVE	1552	100	1576.2		73.1%		0.15323		0.01355

Drainage Sub-basin: CONRAIL

Soil Type	ACRES	% AC	2655.4	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	145.9	5.64	149.7	10 0.564	0.1	0.006	0.26	0.015
D	2348.3	90.74	2409.6	1210.889	0.03	0.027	0.21	0.191
RIVER	93.7	3.6207	96.1	12 0.434	0.03	0.001	0.21	0.008
WTD AVE	2587.9	100	2655.4	11.887		0.034		0.213

Land Use	ACRES	% AC	2655.4		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	59.2	2.30	61.0	0.38	0.9%	0.211	0.00485	0.015	0.00034
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	975.6	37.89	1006.1	0.72	27.3%	0.325	0.12313	0.044	0.01667
COMM	13.4	0.52	13.8	0.85	0.4%	0.895	0.00466	0.045	0.00023
OPEN/MARSH	1526.8	59.293	1574.5	0.7	41.5%	0.058	0.03439	0.0029	0.00172
WTD AVE	2575	100	2655.4		70.1%		0.16703		0.01897

Drainage Sub-basin: CROMAKIL

Soil Type	ACRES	% AC	1525.5	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000	0.22	0.000	0.31	0.000
C	349.4	23.28	355.2	10 2.328	0.1	0.023	0.26	0.061
D	1042.6	69.47	1059.8	12 8.337	0.03	0.021	0.21	0.146
RIVER	108.7	7.2433	110.5	12 0.869	0.03	0.002	0.21	0.015
WTD AVE	1500.7	100	1525.5	11.534		0.046		0.222

Land Use	ACRES	% AC	1525.5		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	118.7	7.83	119.4	0.38	3.0%	0.211	0.01652	0.015	0.00117
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	297.5	19.62	299.3	0.72	14.1%	0.325	0.06377	0.044	0.00863
COMM	5.1	0.34	5.1	0.85	0.3%	0.895	0.00301	0.045	0.00015
OPEN/MARSH	1094.9	72.213	1101.6	0.9	65.0%	0.058	0.04188	0.0029	0.00209
WTD AVE	1516.2	100	1525.5		82.4%		0.12518		0.01205

Drainage Sub-basin: ENGLE

Soil Type	ACRES	% AC	1895.5	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	533.8	29.39	557.1	8 2.351	0.22	0.065	0.31	0.091
C	1053.2	57.99	1099.2	10 5.799	0.1	0.058	0.26	0.151
D	229.2	12.62	239.2	12 1.514	0.03	0.004	0.21	0.027
RIVER	0	0	0.0	12 0	0.03	0.000	0.21	0.000
WTD AVE	1816.2	100	1895.5	9.665		0.126		0.268

Land Use	ACRES	% AC	1895.5		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LMRES	1207.9	65.51	1241.8	0.38	24.9%	0.211	0.13824	0.015	0.00983
HDRES	17.1	0.93	17.6	0.65	0.6%	0.24	0.00223	0.018	0.00017
INDST	73.3	3.98	75.4	0.72	2.9%	0.325	0.01292	0.044	0.00175
COMM	92.2	5.00	94.8	0.85	4.3%	0.895	0.04476	0.045	0.00225
OPEN	453.2	24.581	465.9	0	0.0%	0.058	0.01426	0.0029	0.00071
WTD AVE	1843.7	100	1895.5		32.6%		0.2124		0.01471

Calibration Subcatchment: Overpeck Creek (C14)

Soil Type	ACRES	% AC	1424.62	SUCT=WW(9)		Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	781.8	57.92	825.1	8	4.634	0.22	0.127	0.31	0.180
C	490.5	36.34	517.7	10	3.634	0.1	0.036	0.26	0.094
D	77.5	5.74	81.8	12	0.689	0.03	0.002	0.21	0.012
RIVER	0	0	0.0	12	0	0.03	0.000	0.21	0.000
WTD AVE	1349.8	100	1424.6		8.956		0.165		0.286

Land Use	ACRES	% AC	1424.62		%IMP	BOD-BLD	BOD-RAT	NH3-BLD	NH3-RATE
LMRES	962.3	69.31	987.5	0.38	26.3%	0.211	0.1463	0.015	0.0104
HDRES	39	2.81	40.0	0.65	1.8%	0.24	0.0067	0.018	0.00051
INDST	90.7	6.53	93.1	0.72	4.7%	0.325	0.0212	0.044	0.00287
COMM	43.7	3.15	44.8	0.85	2.7%	0.895	0.0282	0.045	0.00142
OPEN	252.6	18.195	259.2	0	0.0%	0.058	0.0106	0.0029	0.00053
WTD AVE	1388.3	100	1424.6		35.5%		0.213		0.01572

Calibration Subcatchment: Court Street CSO Land Use (C3A)

Soil Type	ACRES	% AC	367.2	SUCT=WW(9)		Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	42.8	11.76	43.2	8	0.941	0.22	0.026	0.31	0.036
C	27.9	7.67	28.2	10	0.767	0.1	0.008	0.26	0.020
D	293	80.54	295.7	12	9.665	0.03	0.024	0.21	0.169
RIVER	0.1	0.0275	0.1	0	0	0	0.000	0	0.000
WTD AVE	363.8	100	367.2		11.373		0.058		0.226

Land Use	ACRES	% AC	367.2		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	177.9	48.34	177.5	0.38	18.4%	0.211	0.102	0.015	0.00725
HDRES	65.2	17.72	65.1	0.65	11.5%	0.24	0.04252	0.018	0.00319
INDST	30.4	8.26	30.3	0.72	5.9%	0.325	0.02685	0.044	0.00363
COMM	20	5.43	20.0	0.85	4.6%	0.895	0.04864	0.045	0.00245
OPEN	74.5	20.245	74.3	0	0.0%	0.058	0.01174	0.0029	0.00059
WTD AVE	368	100	367.2		40.5%		0.23176		0.01711

Calibration Subcatchment: Sip Avenue CSO Land Use (C9A)

Soil Type	ACRES	% AC	246.1	SUCT=WW(9)	Ks=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000 0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8 0.000 0.22	0.000	0.31	0.000
C	201.1	84.96	209.1	10 8.496 0.1	0.085	0.26	0.221
D	35.6	15.04	37.0	12 1.805 0.03	0.005	0.21	0.032
RIVER	0	0	0.0	0 0 0	0.000	0	0.000
WTD AVE	236.7	100	246.1	10.301	0.089		0.252

Land Use	ACRES	% AC	246.1		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	40.3	16.38	40.3	0.38	6.2%	0.21	0.03455	0.015	0.00246
HDRES	144	58.51	144.0	0.65	38.0%	0.24	0.14043	0.018	0.01053
INDST	24.7	10.04	24.7	0.72	7.2%	0.32	0.03262	0.044	0.00442
COMM	24.7	10.04	24.7	0.85	8.5%	0.9	0.08983	0.045	0.00452
OPEN	12.4	5.0386	12.4	0	0.0%	0.06	0.00292	0.0029	0.00015
WTD AVE	246.1	100	246.1		60.0%		0.30035		0.02207

Calibration Subcatchment: St. Paul Street CSO Land Use (C12A)

Soil Type	ACRES	% AC	132	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	314.6	85.07	112.3	8 6.806	0.22	0.187	0.31	0.264
C	55.2	14.93	19.7	10 1.493	0.1	0.015	0.26	0.039
D	0	0.00	0.0	12 0.000	0.03	0.000	0.21	0.000
RIVER	0	0	0.0	0 0	0	0.000	0	0.000
WTD AVE	369.8	100	132.0	8.299		0.202		0.303

Land Use	ACRES	% AC	132		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	30	22.73	30.0	0.38	8.6%	0.211	0.04795	0.015	0.00341
HDRES	24	18.18	24.0	0.65	11.8%	0.24	0.04364	0.018	0.00327
INDST	65	49.24	65.0	0.72	35.5%	0.325	0.16004	0.044	0.02167
COMM	10	7.58	10.0	0.85	6.4%	0.895	0.0678	0.045	0.00341
OPEN	3	2.2727	3.0	0	0.0%	0.058	0.00132	0.0029	0.00007
WTD AVE	132	100	132.0		62.3%		0.32075		0.03182

Calibration Subcatchment: New Milford Storm sewer at Henley Ave.

Soil Type	ACRES	% AC	137.9	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4 0.000	0.38	0.000	0.34	0.0000
B	54.5	39.69	54.7	8 3.176	0.22	0.087	0.31	0.123
C	56.2	40.93	56.4	10 4.093	0.1	0.041	0.26	0.106
D	26.6	19.37	26.7	12 2.325	0.03	0.006	0.21	0.041
RIVER	0	0	0.0	0 0	0	0.000	0	0.000
WTD AVE	137.3	100	137.9	9.594		0.134		0.270

Land Use	ACRES	% AC	137.9		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	15.6	11.28	15.6	0.24	2.7%	0.195	0.02199	0.009	0.00101
MDRES	106	76.62	105.7	0.38	29.1%	0.235	0.18006	0.012	0.00919
INDST	0	0.00	0.0	0.72	0.0%	0.325	0	0.044	0
COMM	13.86	10.02	13.8	0.85	8.5%	0.895	0.08967	0.045	0.00451
OPEN	2.88	2.0818	2.9	0	0.0%	0.058	0.00121	0.0029	0.00006
WTD AVE	138.34	100	137.9		40.3%		0.29293		0.01478

Drainage Sub-basin: Cole's Brook (Van Saun Mill Brook)

Soil Type	ACRES	% AC	4379.3	SUCT=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	5.5	0.13	5.7	4 0.005	0.38	0.000	0.34	0.0004
B	1712	40.57	1776.8	8 3.246	0.22	0.089	0.31	0.126
C	2019.4	47.86	2095.8	10 4.786	0.1	0.048	0.26	0.124
D	482.7	11.44	501.0	12 1.373	0.03	0.003	0.21	0.024
RIVER	0	0	0.0	0 0	0	0.000	0	0.000
WTD AVE	4219.6	100	4379.3	9.410		0.141		0.275

Land Use	ACRES	% AC	4379.3		%IMP	BOD-BLD	BOD-RATE	NH3-BLD	NH3-RATE
LDRES	2867.6	65.90	2886.1	0.38	25.0%	0.211	0.13905	0.015	0.00989
HDRES	96.5	2.22	97.1	0.65	1.4%	0.24	0.00532	0.018	0.0004
INDST	329.2	7.57	331.3	0.72	5.4%	0.325	0.02459	0.044	0.00333
COMM	218	5.01	219.4	0.85	4.3%	0.895	0.04484	0.045	0.00225
OPEN	840	19.305	845.4	0	0.0%	0.058	0.0112	0.0029	0.00056
WTD AVE	4351.3	100	4379.3		36.2%		0.225		0.01643

Calibration Subcatchment: East Riser (C13)

Soil Type	ACRES	% AC	416.7	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	3.3	0.80	3.3	4	0.032	0.38	0.003	0.34	0.0027
B	13	3.15	13.1	8	0.252	0.22	0.007	0.31	0.010
C	110.8	26.85	111.9	10	2.685	0.1	0.027	0.26	0.070
D	285.5	69.20	288.3	12	8.303	0.03	0.021	0.21	0.145
RIVER	0	0	0.0	0	0	0	0.000	0	0.000
WTD AVE	412.6	100	416.7		11.273		0.058		0.228

Land Use	ACRES	% AC	416.7		%IMP	BOD-BLD	BOD	NH3-RAT	NH3
LMRES	175.6	42.14	175.6	0.38	16.0%	0.211	0.08892	0.015	0.00632
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	0	0.00	0.0	0.72	0.0%	0.325	0	0.044	0
COMM	241.1	57.86	101.6	0.85	49.2%	0.895	0.51785	0.045	0.02604
OPEN	0	0	0.0	0	0.0%	0.058	0	0.0029	0
WTD AVE	416.7	100	277.2		65.2%		0.60676		0.03236

Calibration Subcatchment: Kearny Storm Sewer (C8)

Soil Type	ACRES	% AC	38.3	SUCT	=WW(9)	Ks	=WW(10)	IMD	=WW(11)
A	0	0.00	0.0	4	0.000	0.38	0.000	0.34	0.0000
B	0	0.00	0.0	8	0.000	0.22	0.000	0.31	0.000
C	0	0.00	0.0	10	0.000	0.1	0.000	0.26	0.000
D	38.3	100.00	38.3	12	12.000	0.03	0.030	0.21	0.210
RIVER	0	0	0.0	0	0	0	0.000	0	0.000
WTD AVE	38.3	100	38.3		12.000		0.030		0.210

Land Use	ACRES	% AC	38.3		%IMP	BOD-BLD	BOD	NH3-RAT	NH3
LDRES	0	0.00	0.0	0.38	0.0%	0.211	0	0.015	0
HDRES	0	0.00	0.0	0.65	0.0%	0.24	0	0.018	0
INDST	38.3	100.00	38.3	0.72	72.0%	0.325	0.325	0.044	0.044
COMM	0	0.00	0.0	0.85	0.0%	0.895	0	0.045	0
OPEN	0	0	0.0	0	0.0%	0.058	0	0.0029	0
WTD AVE	38.3	100	38.3		72.0%		0.325		0.044