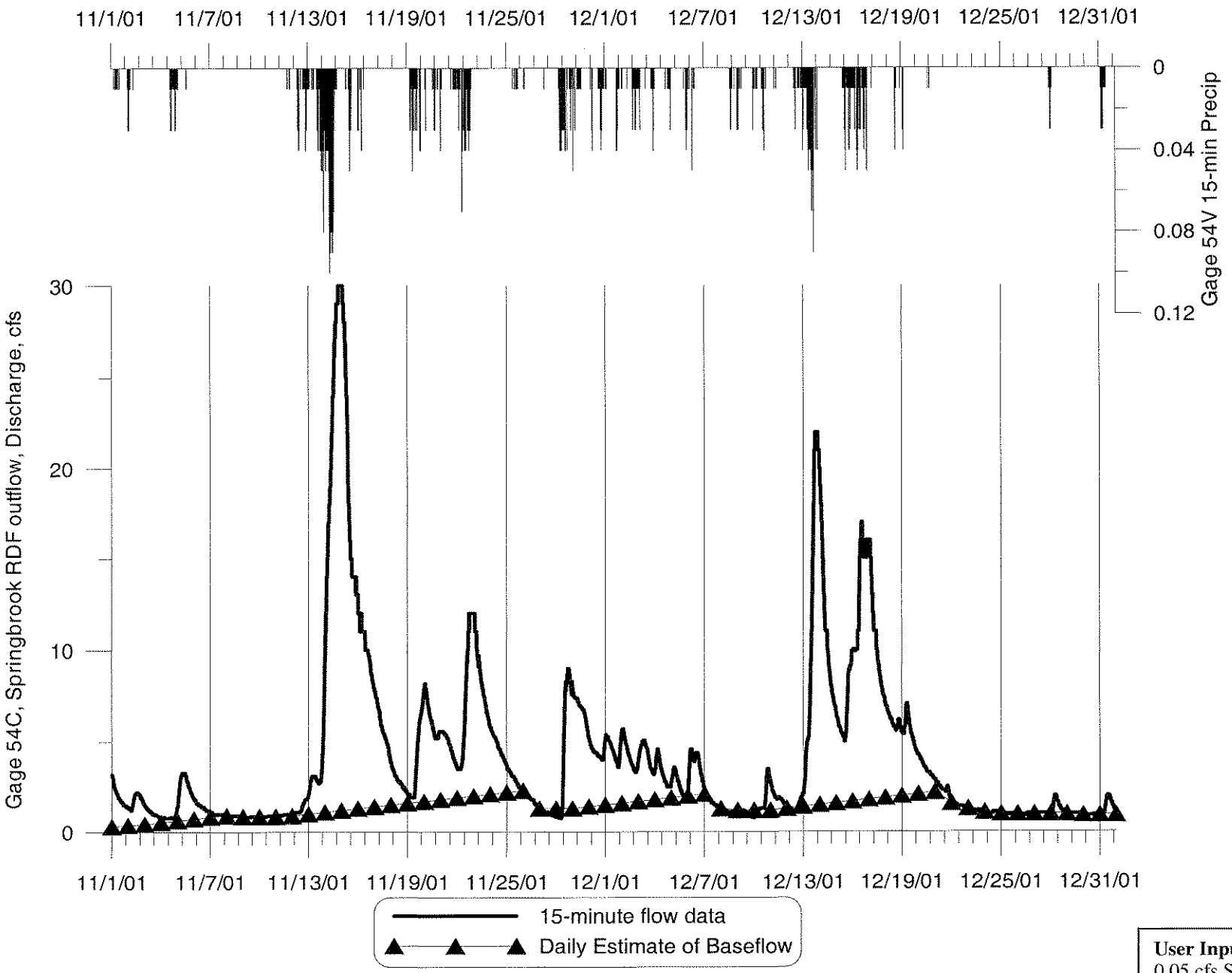
ATTACHMENT 3

Green WQA–Residential Gage 54C Discharge and Precipitation for November–December 2001 Compound Storm Events and Additional Examples of Storm Event Delineation Input Variables and Output for 2001–2002 Data



Green WQA – Residential (54C)

User Input Variables
0.05 cfs Starting Baseflow
20% Max Baseflow Increase
0.1 cfs Max Baseflow Increase
15% Over Base to be Storm

INSTRUCTIONS FOR DAILY FLOW STORM SEPARATION:

A-Residenti 1. COPY DAILY DATA SET INTO COLUMN A
(COPY ENTIRE COLUMN FROM RAW DATA SETS SHEET)
2. VARY INPUT VARIABLES BELOW USING JUDGEMENT
3. SAVE RESULTS ELSEWHERE.

USER INPUT VARIABLES

	0.05	= Starting baseflow if 1st flow value is missing
	20.0%	= Max allowable baseflow increase per day in %:
0.25	0.1	= Max allowable baseflow increase per day in cfs
	15.0%	= Must exceed baseflow by this much to flag as storm

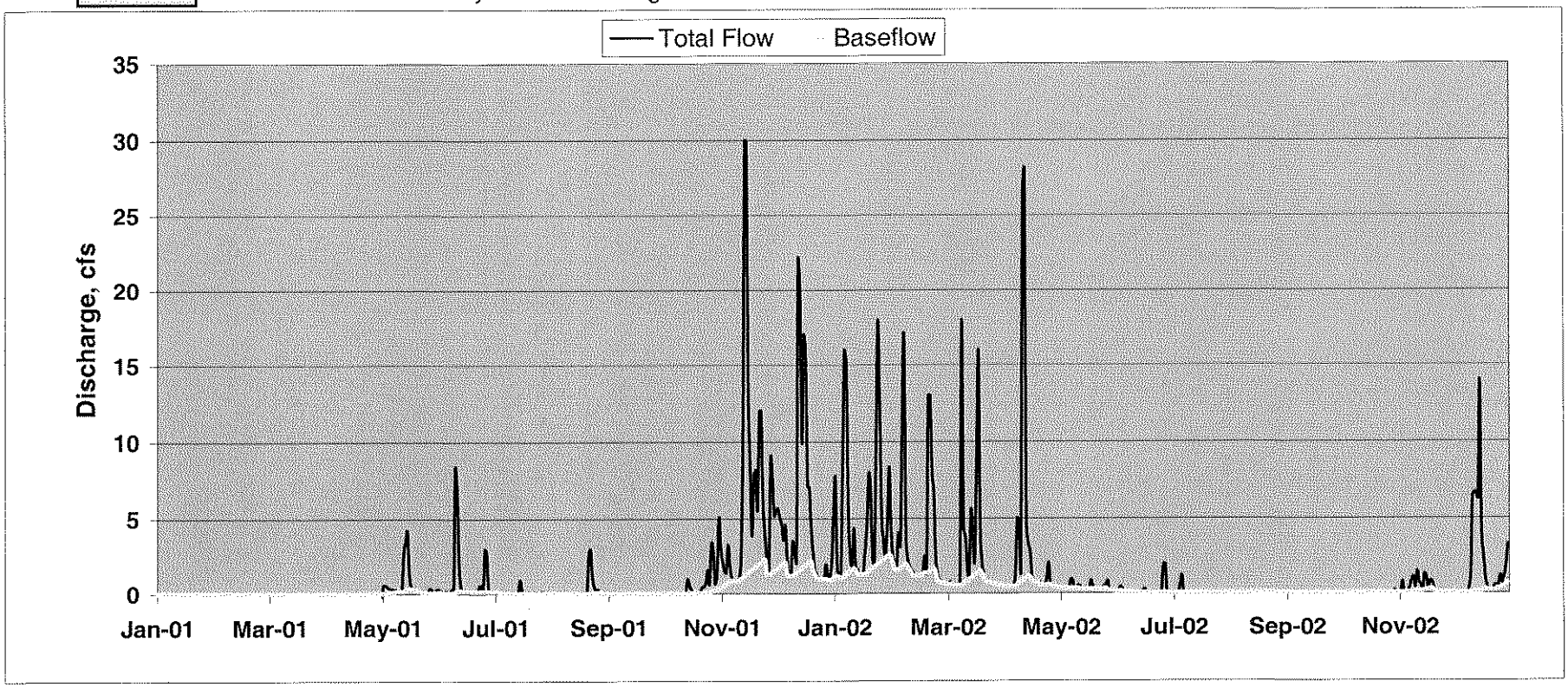
OUTPUT SUMMARY for 2001 - 2002

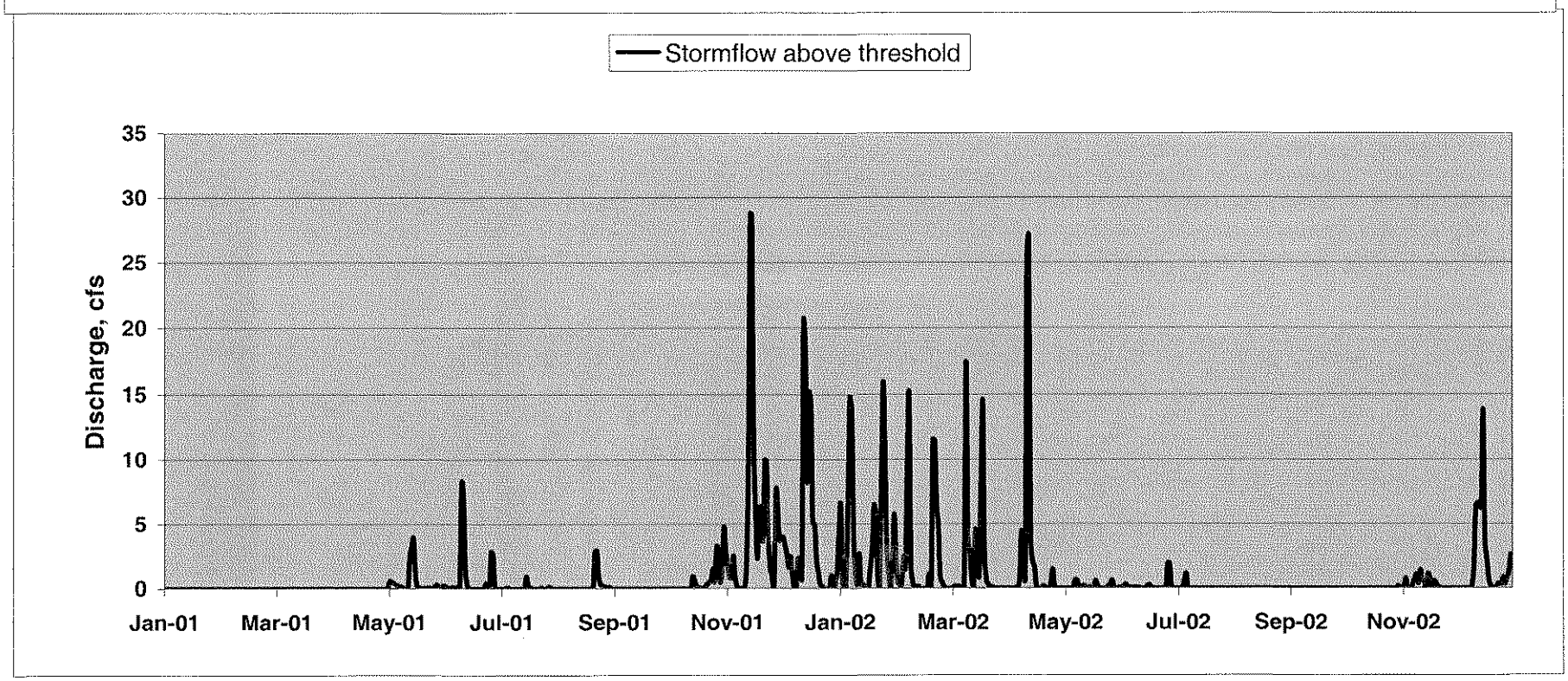
Station ID 54C Max Green WQA-Residential (Springbrook RDF ou

Number of Missing Data Values	**122**
Number of Storm Events	**55**
Maximum Event Duration	**18** Days

Stats	Baseflow	Stormflow
Min	0.0	n/a
Mean	0.4	2.8
Max	2.6	28.8

0.05 20.0% 0.1 15.0%




Stormflow above threshold
Discharge, cfs
35
30
25
20
15
10
5
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02

INSTRUCTIONS FOR DAILY FLOW STORM SEPARATION:

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(COPY ENTIRE COLUMN FROM RAW DATA SETS SHEET)
2. VARY INPUT VARIABLES BELOW USING JUDGEMENT
3. SAVE RESULTS ELSEWHERE.

USER INPUT VARIABLES

	0.05	= Starting baseflow if 1st flow value is missing
	20.0%	= Max allowable baseflow increase per day in %:
0.25	0.1	= Max allowable baseflow increase per day in cfs
	20.0%	= Must exceed baseflow by this much to flag as storm

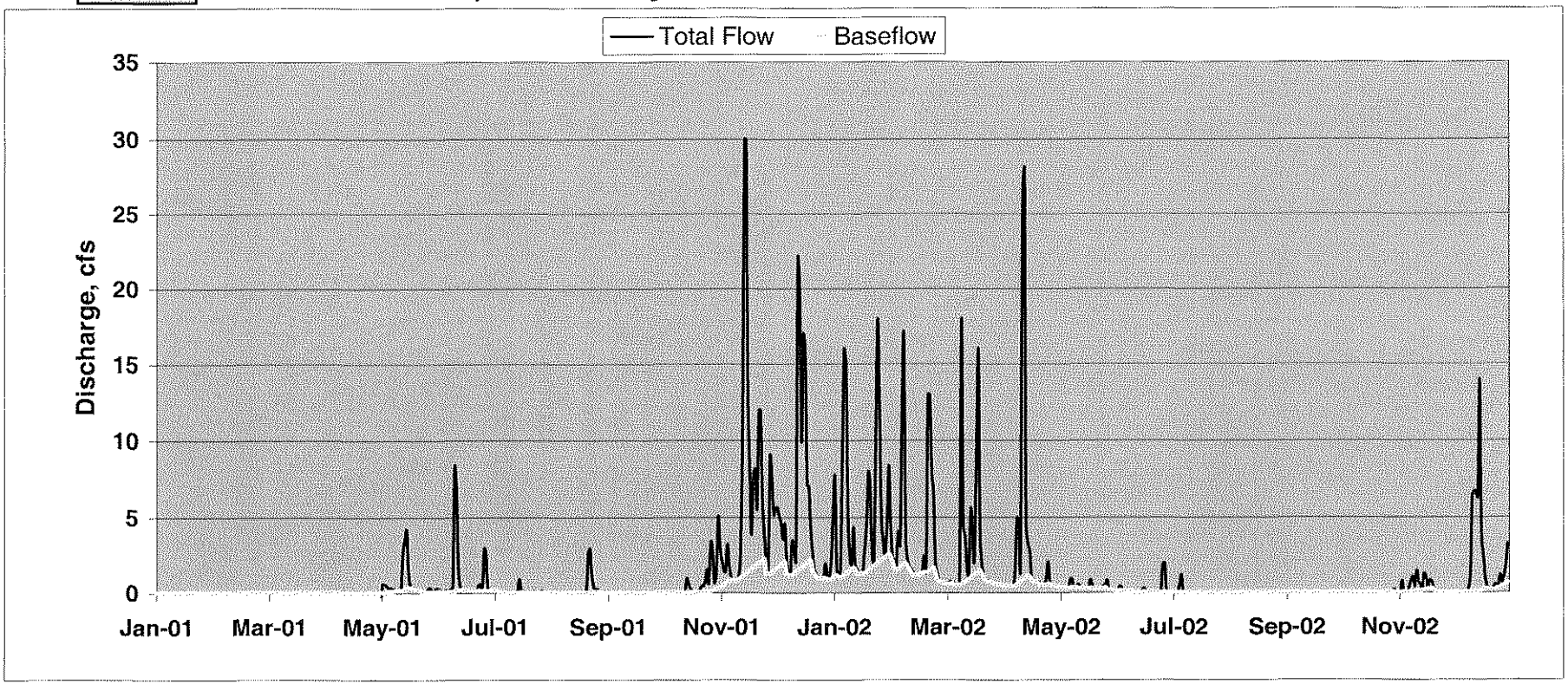
OUTPUT SUMMARY for 2001 - 2002

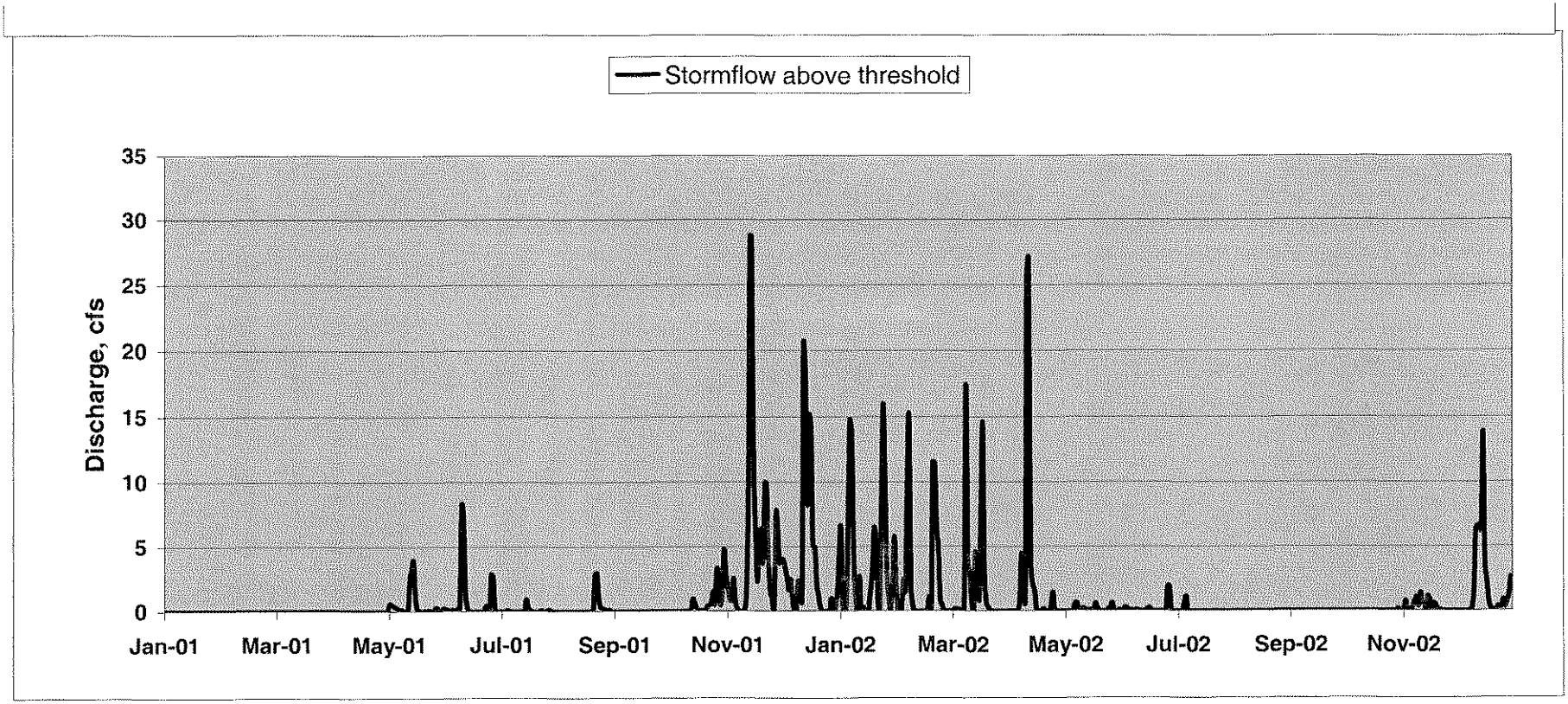
Station ID 54C Max Green WQA-Residential (Springbrook RDF ou

Number of Missing Data Values	**122**
Number of Storm Events	**57**
Maximum Event Duration	**18** Days

Stats	Baseflow	Stormflow
Min	0.0	n/a
Mean	0.4	2.9
Max	2.6	28.8

0.05 20.0% 0.1 20.0%




Stormflow above threshold
Discharge, cfs
35
30
25
20
15
10
5
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02

INSTRUCTIONS FOR DAILY FLOW STORM SEPARATION:

A-Residenti 1. COPY DAILY DATA SET INTO COLUMN A
(COPY ENTIRE COLUMN FROM RAW DATA SETS SHEET)
2. VARY INPUT VARIABLES BELOW USING JUDGEMENT
3. SAVE RESULTS ELSEWHERE.

USER INPUT VARIABLES

	0.05	= Starting baseflow if 1st flow value is missing
	10.0%	= Max allowable baseflow increase per day in %:
0.25	0.05	= Max allowable baseflow increase per day in cfs
	15.0%	= Must exceed baseflow by this much to flag as storm

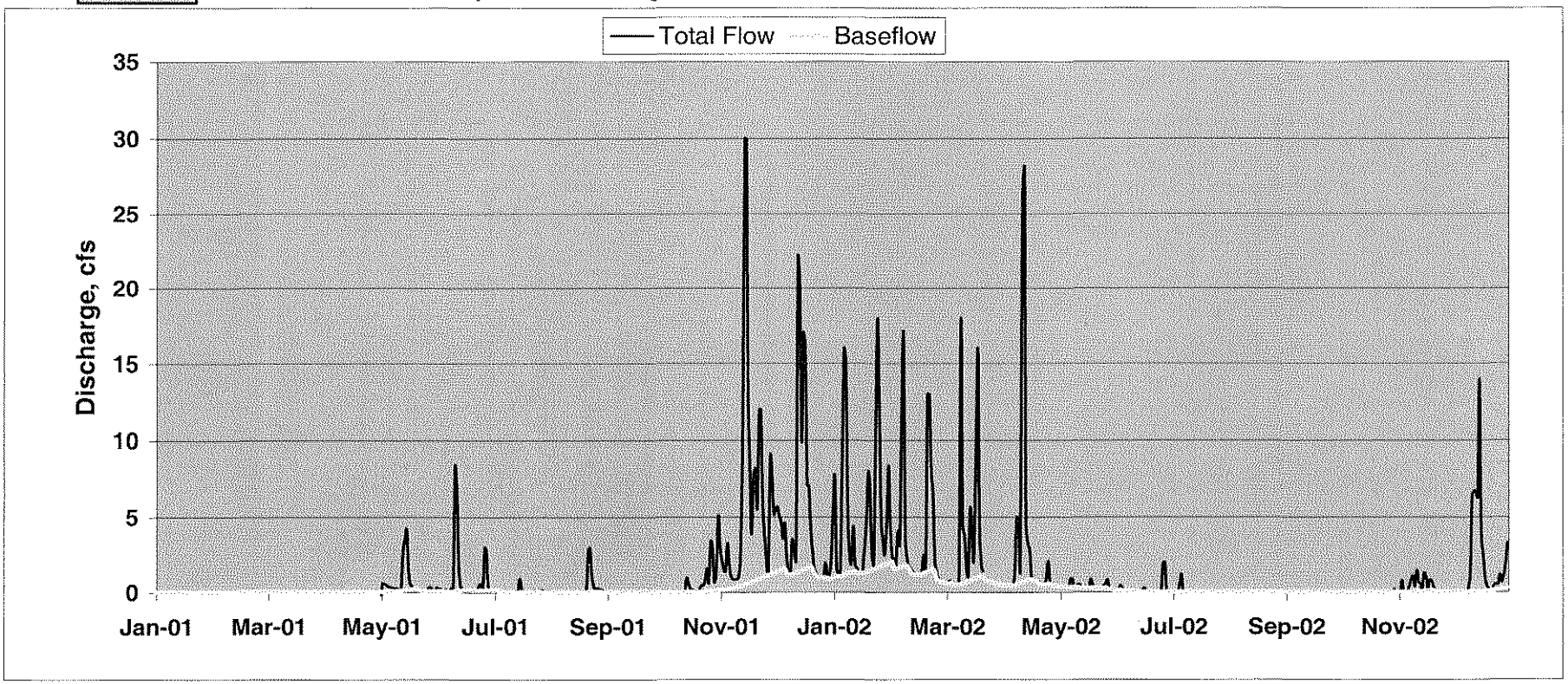
OUTPUT SUMMARY for 2001 - 2002

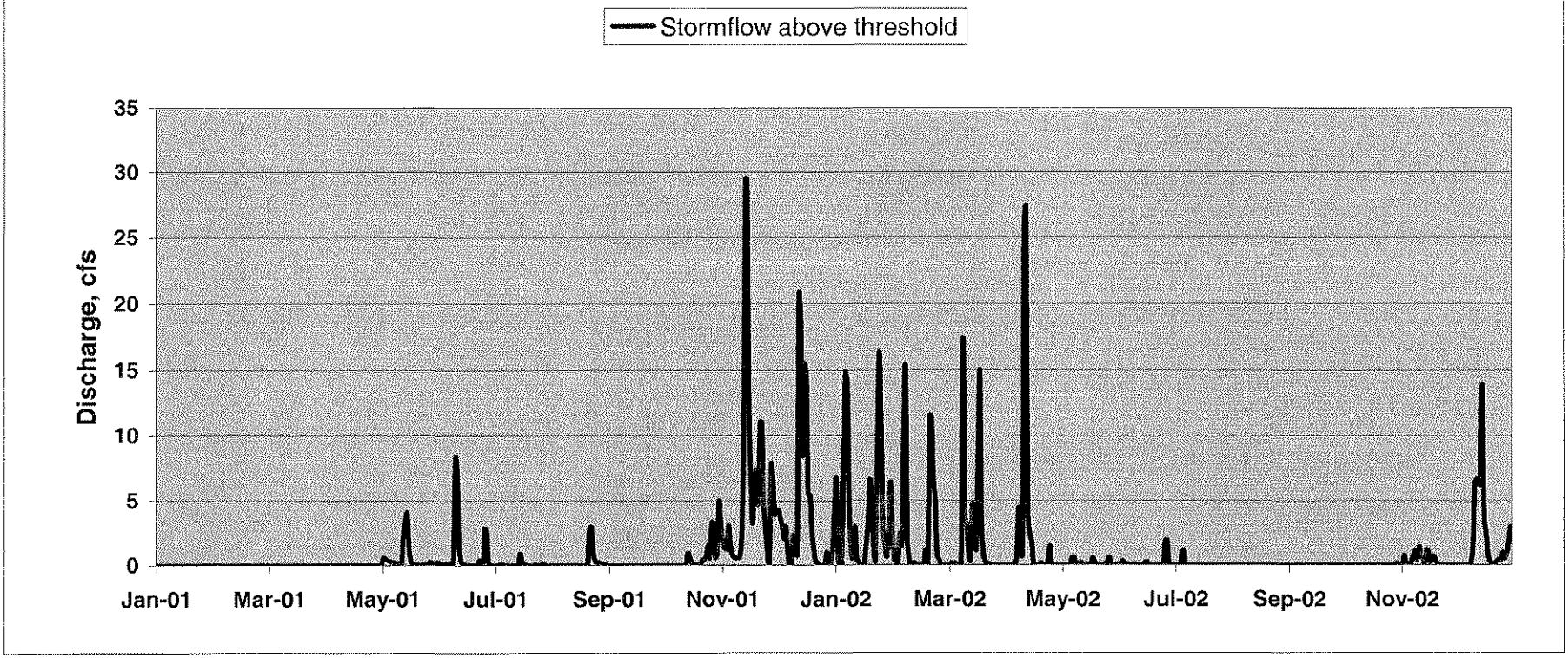
Station ID 54C Max Green WQA-Residential (Springbrook RDF ou

Number of Missing Data Values	**122**
Number of Storm Events	**49**
Maximum Event Duration	**37** Days

Stats	Baseflow	Stormflow
Min	0.0	n/a
Mean	0.4	2.8
Max	2.1	29.5

0.05 10.0% 0.05 15.0%




Stormflow above threshold
Discharge, cfs
35
30
25
20
15
10
5
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02

INSTRUCTIONS FOR DAILY FLOW STORM SEPARATION:

A-Residenti 1. COPY DAILY DATA SET INTO COLUMN A
(COPY ENTIRE COLUMN FROM RAW DATA SETS SHEET)
2. VARY INPUT VARIABLES BELOW USING JUDGEMENT
3. SAVE RESULTS ELSEWHERE.

USER INPUT VARIABLES

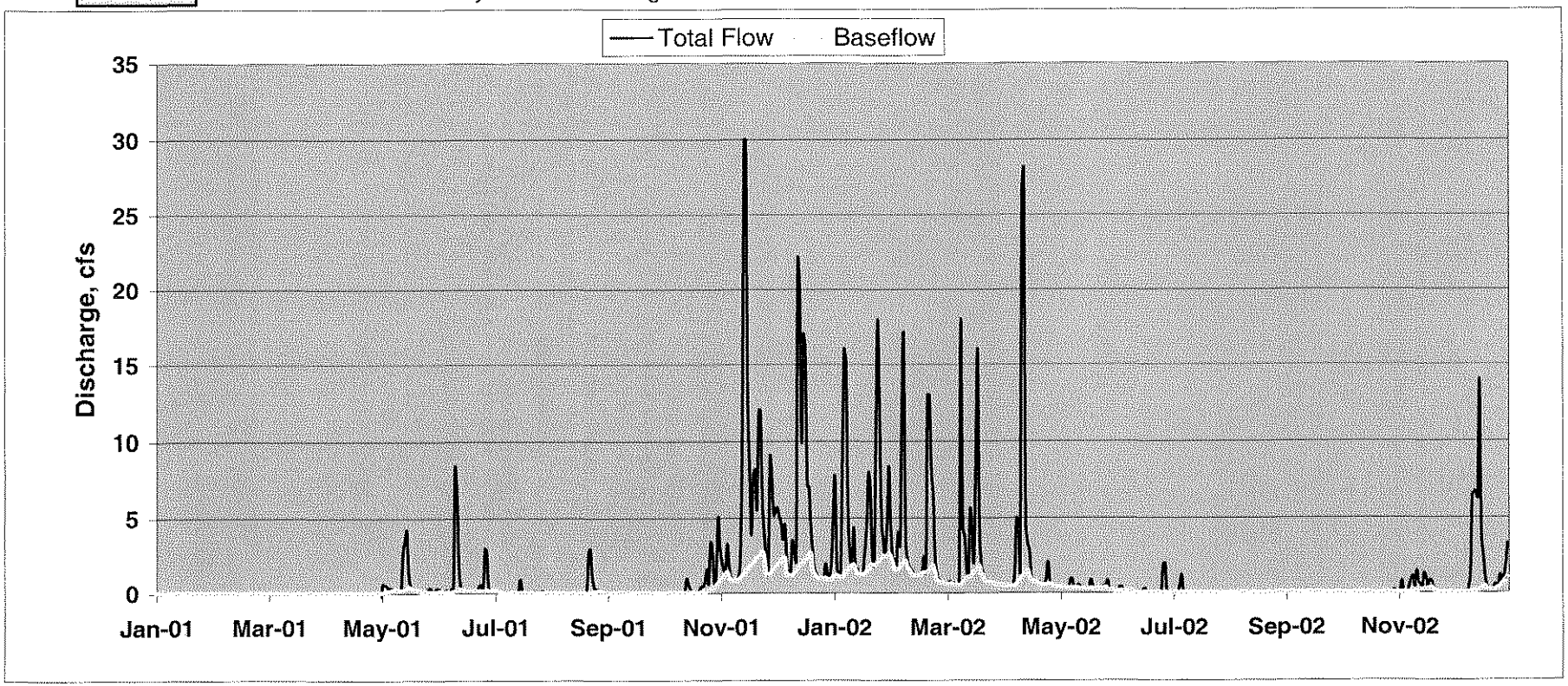
	0.05	= Starting baseflow if 1st flow value is missing
	30.0%	= Max allowable baseflow increase per day in %:
0.25	0.15	= Max allowable baseflow increase per day in cfs
	15.0%	= Must exceed baseflow by this much to flag as storm

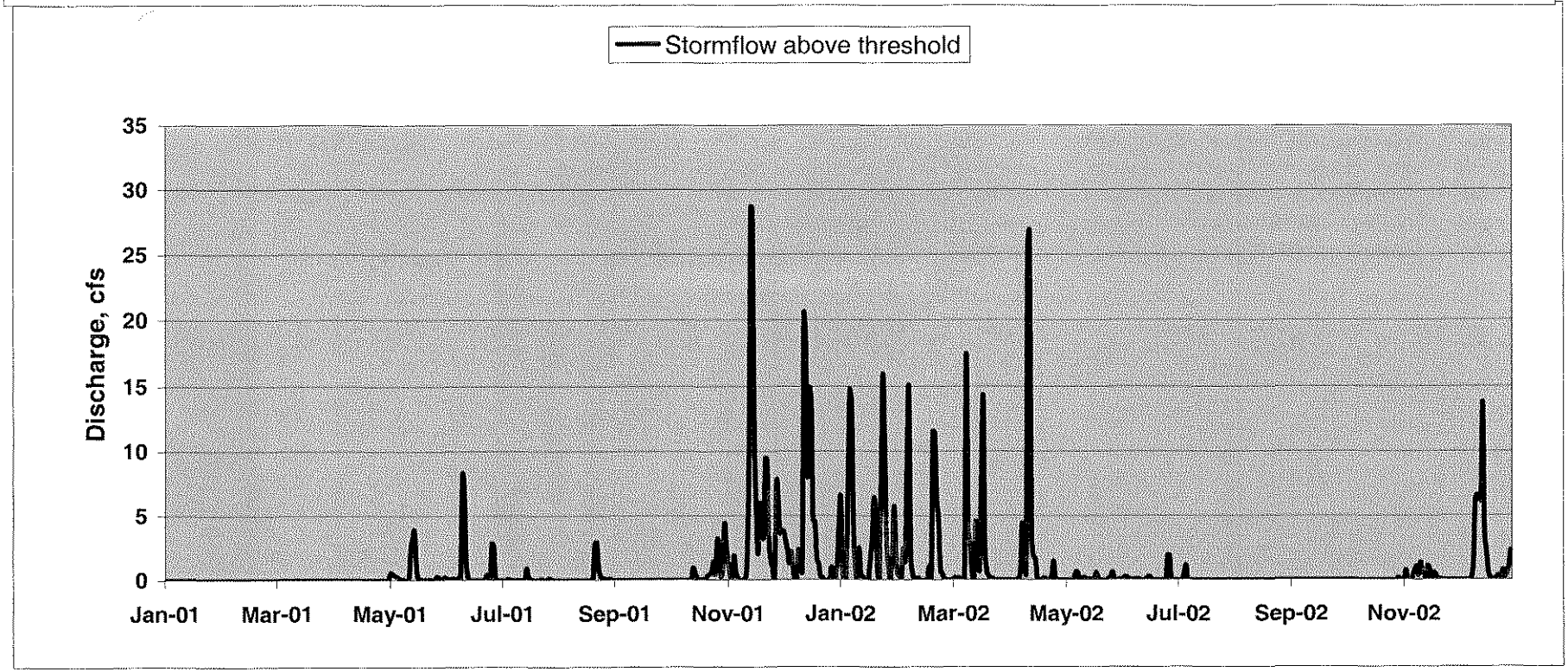
OUTPUT SUMMARY for 2001 - 2002

Station ID 54C Max Green WQA-Residential (Springbrook RDF ou

Number of Missing Data Values	**122**
Number of Storm Events	**59**
Maximum Event Duration	**15** Days

Stats	Baseflow	Stormflow	
Min	0.0	n/a	
Mean	0.5	2.8	
Max	2.8	28.7	
0.05	30.0%	0.15	15.0%




Stormflow above threshold
Discharge, cfs
35
30
25
20
15
10
5
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02

INSTRUCTIONS FOR DAILY FLOW STORM SEPARATION:

A-Residenti **1.** COPY DAILY DATA SET INTO COLUMN A
(COPY ENTIRE COLUMN FROM RAW DATA SETS SHEET)
2. VARY INPUT VARIABLES BELOW USING JUDGEMENT
3. SAVE RESULTS ELSEWHERE.

USER INPUT VARIABLES

	0.05	= Starting baseflow if 1st flow value is missing
	50.0%	= Max allowable baseflow increase per day in %:
0.25	0.3	= Max allowable baseflow increase per day in cfs
	15.0%	= Must exceed baseflow by this much to flag as storm

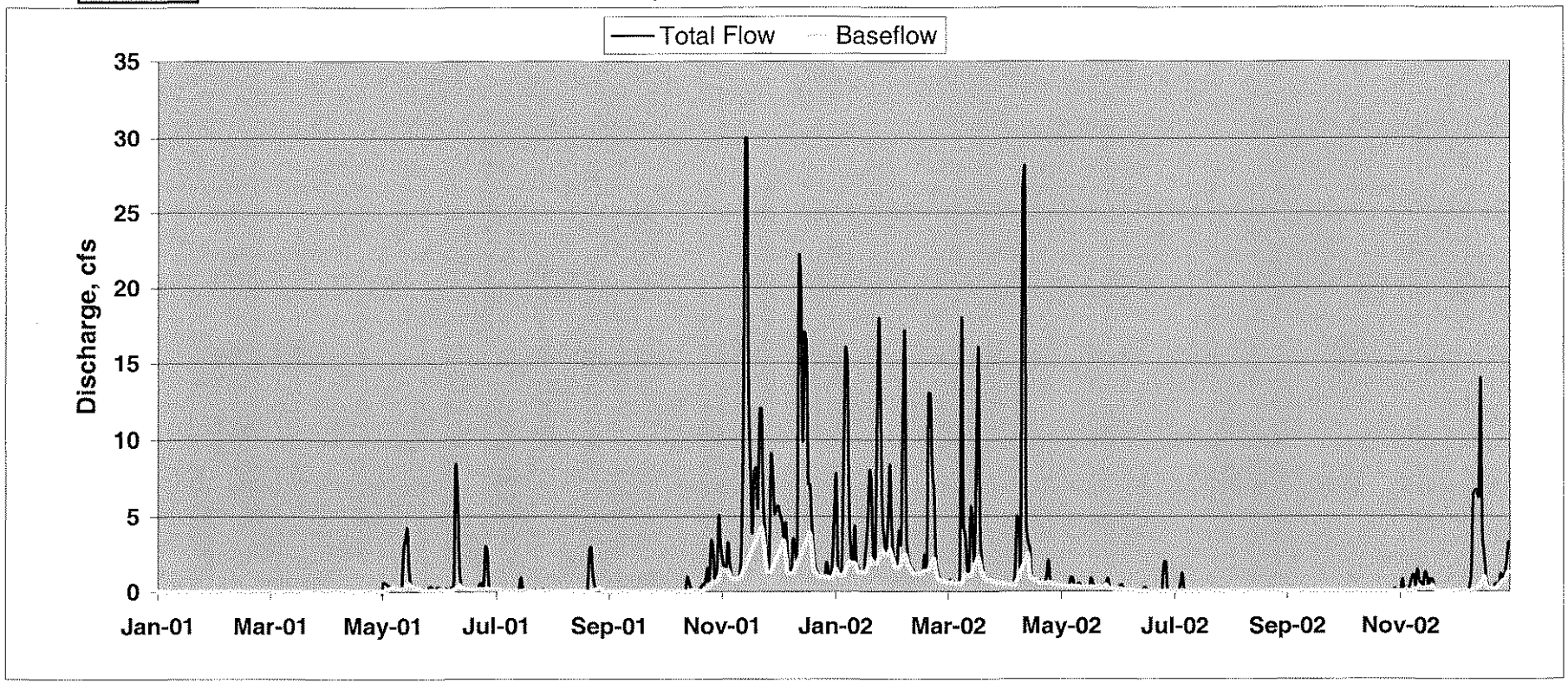
OUTPUT SUMMARY for 2001 - 2002

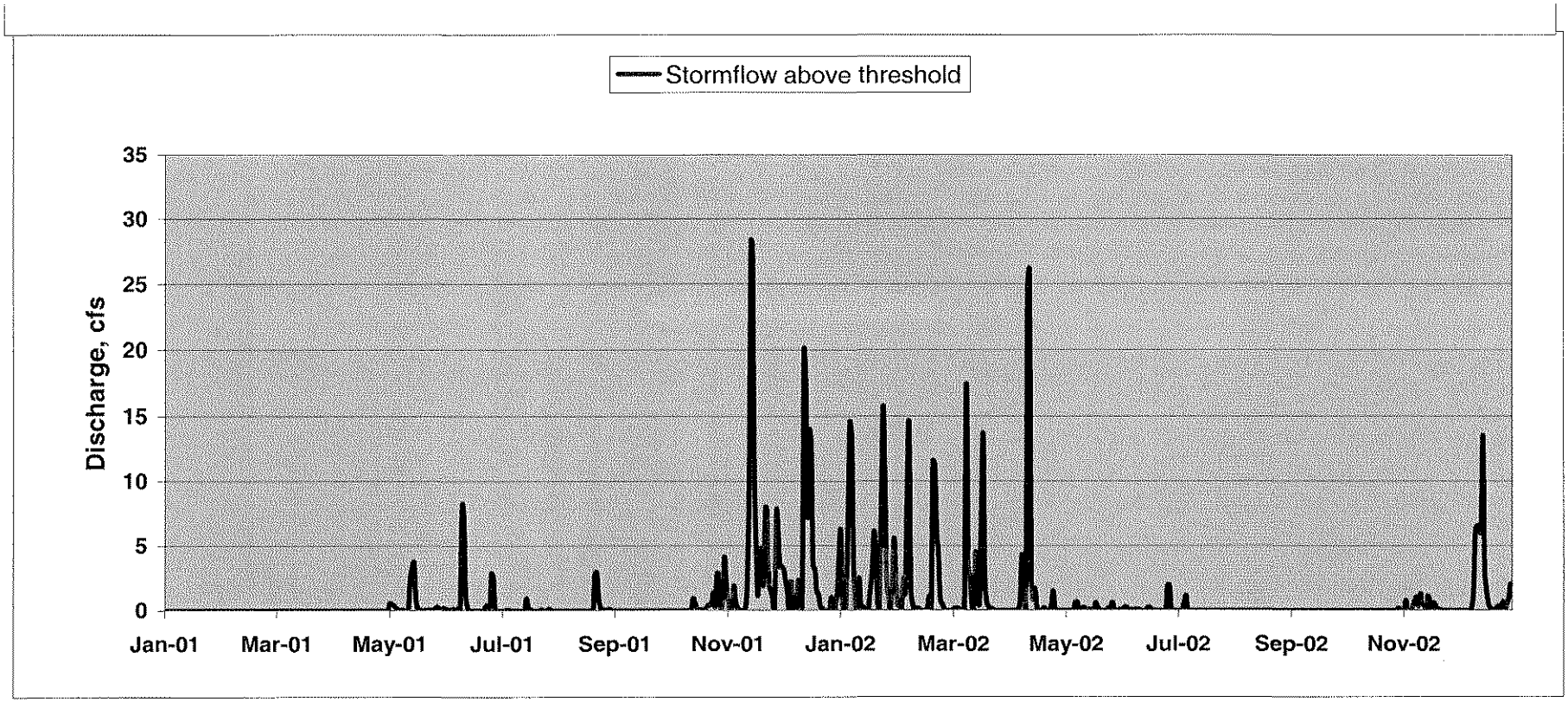
Station ID 54C Max Green WQA-Residential (Springbrook RDF ou

Number of Missing Data Values	**122**
Number of Storm Events	**64**
Maximum Event Duration	**15** Days

Stats	Baseflow	Stormflow
Min	0.0	n/a
Mean	0.5	2.7
Max	4.3	28.4

0.05 50.0% 0.3 15.0%




Stormflow above threshold
Discharge, cfs
35
30
25
20
15
10
5
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02

Results are for Cal Years 2001 and 2002 combined. Excludes Oct-Dec 2000.

			Input Variables					Output Variables									
														Computed Base Flow Rates			Computed Stormflow	
Operator	Gage No.	Gage Name	Starting Base Flow (cfs)	Maximum Base Flow Increase (%/day)	Maximum Base Flow Increase (cfs/day)	Storm if Exceeds Base Flow by percent	Storm if Exceeds Base Flow by cfs	No. of Missing Discharge Values (hours)	No. of Missing Discharge Values (days)	No. of Storm Events	Approx # Events per Year	Maximum Storm Event Duration (days)	Minimum (cfs)	Mean (cfs)	Maximum (cfs)	Mean (cfs)	Max (cfs)
WLR	03F	Mill Creek (north) above Kent Facility	5	20.0%	0.3	15.0%	0.80	10530	438.8	124	155.4	10.3	0.5	1.5	6.6	10.9	139.2
WLR	03G	Springbrook at O'Grady	120	20.0%	3.6	15.0%	0.15	8082	336.8	75	69.6	10.4	6.0	22.8	120.0	58.8	297.0
WLR	40D	Crisp Creek at Green River Road	4.9	20.0%	0.7	15.0%	0.15	0	0.0	404	202	11.9	1.7	6.1	13.0	2.9	42.0
WLR	44F	Green WQA-Urban	0.01	20.0%	0.02	15.0%	0.15	1914	79.8	300	168.4	14	0.0	0.1	0.5	1.8	86.0
WLR	44G	Green WQA-Agricultural	1	50.0%	0.3	15.0%	0.15	4996	208.2	61	42.7	6.8	0.0	1.1	6.1	3.1	28.5
WLR	44H	Newaukum Creek at 305th	1	20.0%	0.16	15.0%	0.15	14150	589.6	30	78	4.6	0.4	0.8	1.8	1.0	6.6
WLR	54C	Green WQA-Residential (Springwood RDF)	0.5	20.0%	0.08	15.0%	0.15	2946	122.8	68	40.9	14	0.0	0.4	2.3	2.7	28.9
WLR	HA5	Hamm Creek South Fork	1.6	20.0%	0.24	15.0%	0.15	0	0.0	282	141	6.5	0.5	1.2	2.6	1.4	25.0
USGS	12105900	Green River Below Howard A. Hanson Dam	409	20.0%	53	15.0%	0.15	0	0.0	92	46	15.5	157.4	642.9	1978.1	710.8	5282.8
USGS	12108500	Newaukum Creek Near Black Diamond	44	20.0%	7.3	15.0%	0.15	72	3.0	124	62.3	8	6.8	35.7	127.6	43.3	399.9
USGS	12112600	Soos Creek near Mouth (WLR Gage 54A)	36	20.0%	17	15.0%	0.15	114	4.8	87	43.8	12.6	20.1	88.2	335.1	72.8	674.8
WLR	41A	Mill Creek at SR 181															
WLR	03A	Panther Creek at Talbot RD															

revised data expected to be forthcoming from King County

NOTE: indicates parameters selected by judgement, not sticking to formulas

NOTE: for subsequent sheets. . . Flow
Flag
-1 = missing
0 = baseflow
1 = storm