(a) INPUTS

Input Parameters

River Threshold	
10 km^2	
Order	H_n
1	1 m
2	2 m
3	3 m

Input Datasets

Digital Elevation Model

24	23	23	22	21	21	20	20	20	21	22	24
26	24	24	22	20	19	18	19	20	21	20	25
25	24	25	22	21	20	19	17	18	19	20	21
27	23	23	21	22	23	21	16	18	19	20	20
26	22	20	19	20	20	18	17	15	17	18	18
25	22	20	20	18	18	17	15	14	15	15	16
23	21	21	20	18	17	16	15	15	13	14	15
23	21	20	20	18	17	17	16	16	13	12	14
23	20	20	19	19	19	18	17	15	13	11	13
23	23	23	22	21	20	19	18	17	14	10	12
24	23	23	23	22	20	19	15	14	11	9	11
26	24	24	23	23	21	19	18	16	10	8	10

Flow Direction Grid

→	→	→	→	→	→	↓	↙	↓	↓	↓	↙
→	→	→	→	→	→	↓	↙	↓	↓	↙	←
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖
→	→	→	→	→	→	↓	↙	↓	↙	←	↖

Upstream Drainage Area

1	3	5	6	1	1	1	1	1	1	1	1
1	1	1	2	10	13	18	1	2	1	5	1
1	1	1	1	1	1	1	32	10	9	2	1
1	2	2	2	1	1	1	35	1	1	1	1
1	3	6	14	1	1	2	1	38	2	1	2
1	1	2	1	17	1	2	5	104	1	4	1
1	3	1	2	3	43	50	57	1	111	2	1
1	2	6	1	22	5	1	5	1	2	115	1
1	4	5	20	3	1	4	2	4	6	122	1
1	1	1	7	2	3	1	4	1	1	124	1
1	4	6	1	2	2	3	4	10	2	127	1
1	1	1	1	1	1	2	1	1	12	144	1

river origin river cell

Strahler Stream Order

				1	1	1					
							2	1			
							2				
			1					2			
				1				3			
					2	2	2		3		
				1						3	
			1							3	
										3	
									1	3	
									1	3	

Order: 1 2 3

(b) PROCESS

Process each order individually

Strahler Order 1, H_1 = 1 m

24	23	23	22	21	21	20	20	20	21	22	24
26	24	24	22	20	19	18	19	20	21	20	25
25	24	25	21	21	20	19	17	18	19	20	21
27	23	23	22	22	23	21	16	18	19	20	20
26	22	20	19	20	20	18	17	15	17	18	18
25	22	20	20	18	18	17	15	14	15	15	16
23	21	21	20	18	17	16	15	15	13	14	15
23	21	20	20	18	17	17	16	16	13	12	14
23	20	20	19	19	19	18	17	15	13	11	13
23	23	23	22	21	20	19	18	17	14	10	12
24	23	23	23	22	20	19	15	14	11	9	11
26	24	24	23	23	21	19	18	16	10	8	10

river cell flooded cell

Strahler Order 2, H_2 = 2 m

24	23	23	22	21	21	20	20	20	21	22	24
26	24	24	22	20	19	18	19	20	21	20	25
25	24	25	21	21	20	19	17	18	19	20	21
27	23	23	22	22	23	21	16	18	19	20	20
26	22	20	19	20	20	18	17	15	17	18	18
25	22	20	20	18	18	17	15	14	15	15	16
23	21	21	20	18	17	16	15	15	13	14	15
23	21	20	20	18	17	17	16	16	13	12	14
23	20	20	19	19	19	18	17	15	13	11	13
23	23	23	22	21	20	19	18	17	14	10	12
24	23	23	23	22	20	19	15	14	11	9	11
26	24	24	23	23	21	19	18	16	10	8	10

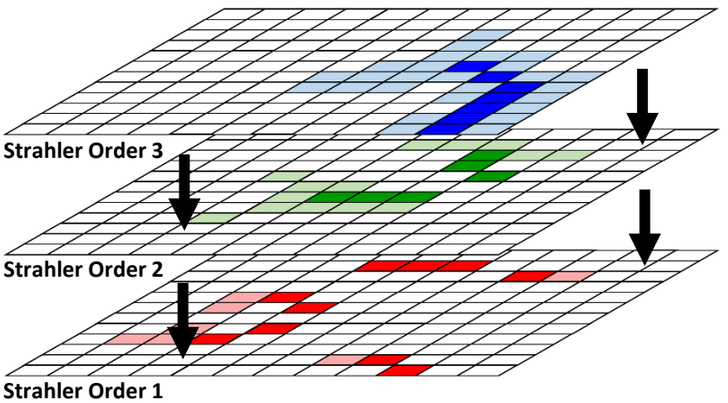
river cell flooded cell

Strahler Order 3, H_3 = 3 m

24	23	23	22	21	21	20	20	20	21	22	24
26	24	24	22	20	19	18	19	20	21	20	25
25	24	25	21	21	20	19	17	18	19	20	21
27	23	23	22	22	23	21	16	18	19	20	20
26	22	20	19	20	20	18	17	15	17	18	18
25	22	20	20	18	18	17	15	14	15	15	16
23	21	21	20	18	17	16	15	15	13	14	15
23	21	20	20	18	17	17	16	16	13	12	14
23	20	20	19	19	19	18	17	15	13	11	13
23	23	23	22	21	20	19	18	17	14	10	12
24	23	23	23	22	20	19	15	14	11	9	11
26	24	24	23	23	21	19	18	16	10	8	10

river cell flooded cell

Combine the orders



(c) OUTPUTS

Flooded Upstream Drainage Area

				10	32	32	32				
							104	32	32		
							104				
		14	43				104	104	104		
		14		43	50	104	104	104	111	115	
				43	104	104	104	111	111	115	115
		20		43	104	104	104		122	115	122
	20	20	43						124	122	124
										124	127
							14	14	144	127	144
									144	144	144

Drainage Area

10 km^2

144 km^2

Flooded Strahler Stream Order

				1	2	2	2				
							3	2	2		
							3				
		1	2				3	3	3		
		1		2	2	3	3	3	3	3	
				2	3	3	3	3	3	3	3
		1		2	3	3	3		3	3	3
	1	1	2						3	3	3
										3	3
							1	1	3	3	3
									3	3	3

Stream Order

1

2

3